

User Manual

Version 1.3 e

SLC-D2 Series

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Introduction

Technical Support

Thank you for purchasing the SLC-D2 series. This product is warranted to be free of manufacturing defects for one year from the date of purchase. Our technical support group is glad to work with you in answering your questions. If you cannot find the solution to your particular application, or, if for any reason you need additional technical assistance, please use the ways as following:

Tel: 886-3-5727772 (Mon.-Fri., 8:30 - 18:00, Taiwan) Fax: 886-3-5728898 Email: service@lttcorp.com Web: www.lttcorp.com Address: No. 121, Lane 99, Pu-Ding Road, Hsin Chu City, Taiwan, R.O.C.

Disclaimer

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Special Symbols



Failure to follow instructions may lead to product damage, or error.



Failure to follow instructions may lead to injury by electric shock.



Failure to follow instructions may lead to injury by invisible radiation.

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Chapter 1 Safety

1.1 Safety Regulation



The SLC-D2 series uses a CO₂ Laser as a light source. It is classified as a class-IIIR product by **CDRH (the Center for Devices and Radiological Health)**.

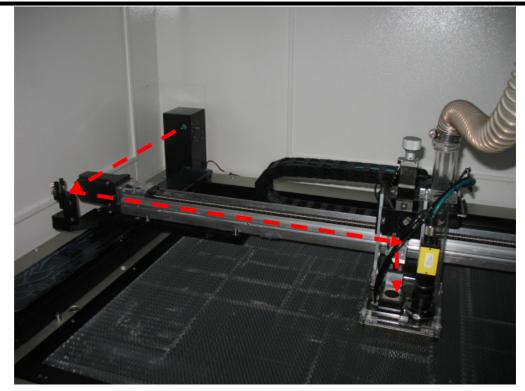


Wavelength : 9.3~10.6µm Maximum output power : 30 ~ 100W Visibility : Invisible

When operating the SLC-D2 series, be sure to always comply with the safety regulations as following:

- Do not attempt to modify or disassemble any component of the machine without LTT technical support.
- Do not open the doors of chassis and access the laser tube or electronic components, especially while the machine power is on.
- Connect the machine to a grounded outlet. Verify that the voltage of the outlet is correct for the machine.
- Do not disable the interlocks which are on top and front doors.
- Be careful about the path of the invisible laser beam shown in figure. Otherwise, eye or skin injury may result.

Chapter 1 Safety



- Do not watch the laser beam directly during operation. Bright light caused by the lasing process can damage the eye.
- The side and rear doors are fixed by screws for safety. If you open these doors, the SLC-D2 will become a Class 4 laser device. For your safe, please wear protective goggles.
- The laser beam may cause fire. Never leave machine along without other operator watching during the laser cutting process. Keep a fire extinguisher near the machine at any time.
- Blowing materials with air flow from nozzle while cutting or engraving can avoid fire occurring and also obtain good quality.
- Verify that materials used in the cutting are proper for lasing. Never cut substrates that contain **PVC** or **Teflon**.
- Good efficiency of exhaust system makes you avoid breathing dust, debris or poison gas.
- Please comply with maintenance schedule as chapter 4 to keep SLC-D2 working well.
- Before you execute auto focusing function, please make sure that there will be no crashing between motion system and other objects. For safety, it is **NOT** recommended to use auto focusing function on inequality materials.

Chapter 1 Safety **1.2** Name Plate and Warning Labels

The labels as following are affixed to the SLC-D2. These labels must never be removed. If they are damaged or tampered for any reason, please request for LTT immediately to replace them.

1



2



3



WARNING

Moving Parts Present Can result in serious injury to hands or fingers. Keep hands away from moving parts. Disconnect and lockout power before servicing.

4



A WARNING

HAZARDOUS VOLTAGE.

Contact may cause electric shock or burn. Turn off and lock out system power before servicing.



Chapter 1 Safety



Interlock

The laser beam will not be emitted if you open the **front** door. The LED indicator of "**DOOR**" on control panel will be off.





DOOR •

Front door opens

Laser Switch

Laser switch on control panel can shut down the power of laser system immediately, and it has no effect on motion system. Compared with interlock, Turning off laser switch can save power. When you turn on laser switch, the LED indicator of

"**LASER**" on control panel will be on (it needs to take more than 5 seconds to warm up laser tube while you turn it on).



Chapter 1 Safety

Emergency Stop Switch

Pressing the red pushbutton can shut down the main power of system immediately when emergency condition occurs. And turning right the red pushbutton can recover the power (Before recovering power, please clear the trouble in the machine first).





OFF

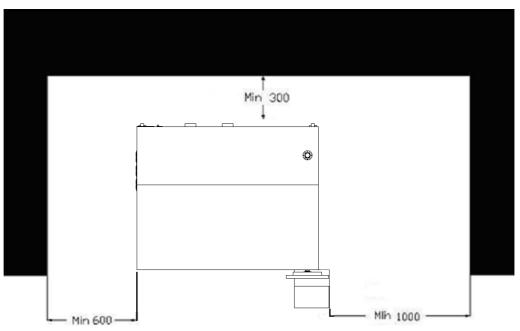


Chapter 2 Installation

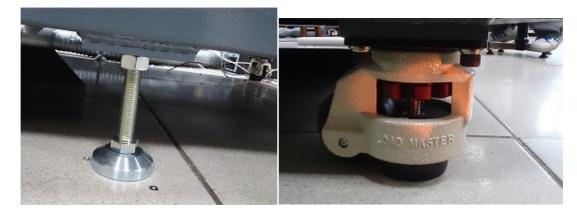
2.1 Unpack and Locate Machine

This section explains how to unpack and locate machine.

1. Locate the machine and keep the recommended space for maintenance.



2. Lock the wheels to locate the machine.



Unit: mm

Chapter 2 Installation

2.2 Package Contents List

This section explains the package contents of the SLC. The package includes the following components. Before using the unit, check that all components have been included in the package.

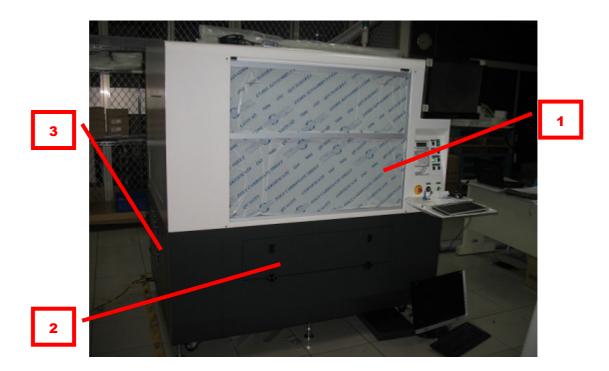


4 Allen Wrench

11

2.3 Part Names and Functions

This section explains the main part names and functions of the SLC-D2.





1. Front Door

This door has interlock sensors for safety. If you open this door, the laser will be not emitted.



2. Front Door of chassis

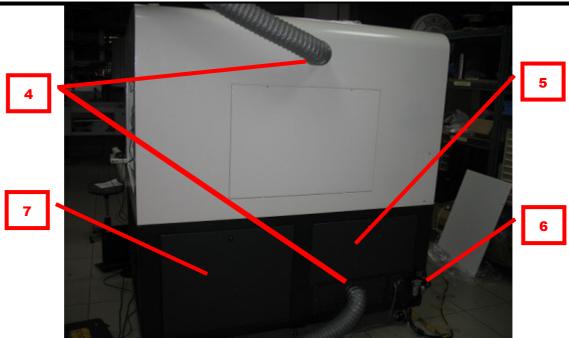
Mostly opening this door is for maintaining. Do **NOT** open this door if it's not necessary, especially the machine power is on.



3. Side Door (Left) of chassis

Mostly opening this door is for maintaining. Do **NOT** open this door if it's not necessary, especially the machine power is on.

Chapter 2 Installation



4. Exhaust Port

These two ports can exhaust the smoke which is caused by cutting. These ports have to be connected to blower through pipes.



5. Side Door (Right) of chassis

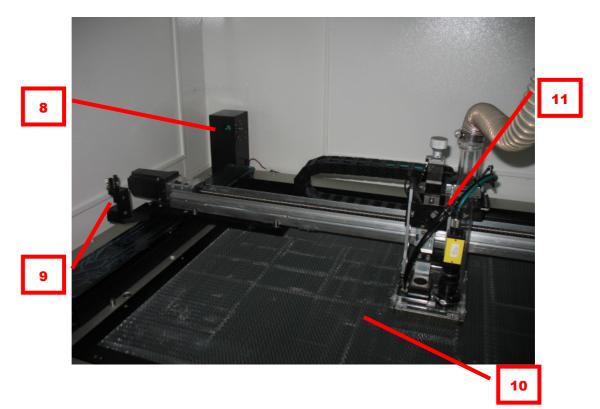
Mostly opening this door is for maintaining. Do **NOT** open this door if it's not necessary, especially the machine power is on.

6. Air Filter

This part provides air assist through the hose which is connected to air compressor.

7. Fans

These parts can dissipate the heat in the chassis which is caused by laser generator.



8. Window Lens

This part can protect $1^{st} \sim 3^{rd}$ mirror against dusts or debris. It should be cleaned this lens daily. (See <u>chapter 4</u>)

9. 4th Mirror

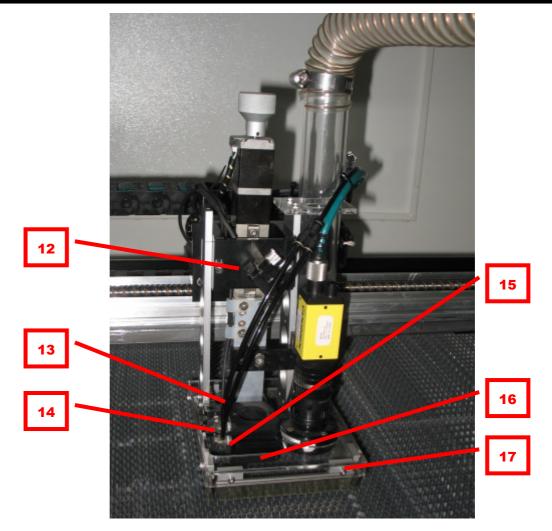
This part reflects laser beam to carriage. Also, it should be cleaned this lens daily. (See <u>chapter 4</u>)

10. Table

This part can carry materials for cutting.

11. Carriage

This part includes 5^{th} mirror, focal lens, nozzle, and auto focusing set. You can move it left, right, forth and back by the keys on control panel. (See section <u>3.2.1</u>)



12. Final Mirror

This part reflect laser beam to focal lens. Also, it should be cleaned daily. (See <u>chapter 4</u>)

13. Focal Lens

This part can focus the laser beam on materials for cutiing. Also, it should be cleaned this lens daily. (See <u>chapter 4</u>)

14. Auto Focal System

This part can adjust focal height automatically by touching material.

14. Auto Focal System

This part can adjust focal height automatically by touching material.

15. Air Assist Adjustment

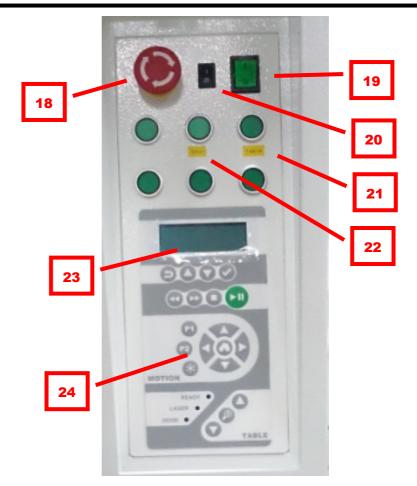
This part can adjust air flow which is out of the nozzle.

16. Nozzle

This part can provide a air assist to protect focal lens against dust or debris.

17. Real-time Exhaust

This part can remove dust immediately



18. Emergency Stop

Please see section 1.3

19. Power Switch

This switch can turn on/off the main power of this machine. Please see section 1.3

20. Laser Power Switch

Please see section 1.3 This switch can turn on/off the main power of this machine.

21. Downdraft System Switch

These switches control the downdraft system, upper is on, lower is off.Please see section 1.3

22. Automatic Door Switch.

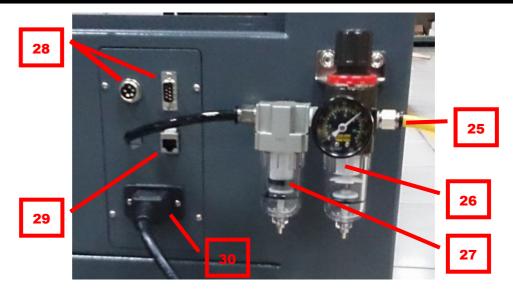
These switches control the automatic door, upper is close the door, lower is open the door.

23. LCD Display

LCD display shows the operating menu and information from system. If you want to obtain more detail about operating menu, please see section 3.2.2.

24. Control Panel

Control panel provide the keys to operate machine. If you want to obtain more detail about operating menu, please see section <u>3.2.1</u>.LCD display shows the operating menu and information from system. If you want to obtain more detail about operating menu, please see section <u>3.2.2</u>.



25. Air Inlet Port

This part is the total air inlet for this machine. This part is used for part electromagnetic valve.

26. Air Filter

This part filtered water vapor in the airis the total air inlet for this machine. This part is used for part electromagnetic valve.

27. Oil mist separator

This part provide extra filtered for water vapor in the air. This part can send files from computer to machine through a USB cable. This part is the total air inlet for this machine.

28. Serials Port

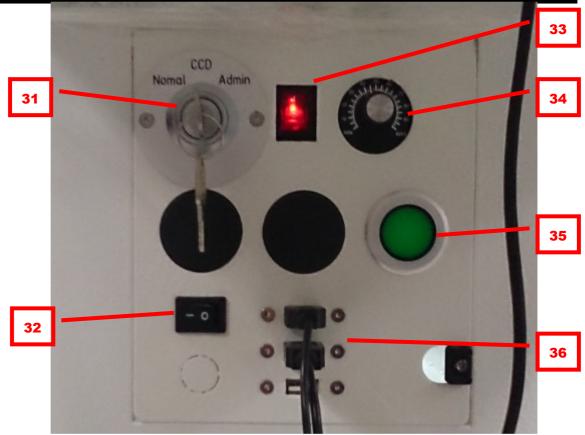
This part is used for the expansion of I/O module. This part can send files from computer to machine through a USB cable.

29. RJ-45 Ethernet Port

SLD-D2 provides built-in computer instead of external computer, it providing computer Internet or LAN through this PORT. This part is used for the expansion of I/O module.

30. Power Inlet

This part can provide main power through cable from power supply. This part is used for air flow steady before cutting



31. User Permissions Switch

This part provides user to switch the premissions by key switch.

Normal : Normal user without CCD function.

CCD : Normal user with CCD function.

Admin : Administration user with all function and close the interlock function.

*under the [Admin] permission, the machine will become a Class 4 laser device. For

your safe, please wear protective goggles. (see section 1.1)

31. Light Switch

This switch controls the light inside the machine.

33. CCD Light Switch

This switch controls the CCD Light, turn it on before use the CCD function.

34. CCD Light modulator

This part control the CCD light, adjust it depending on using demand

35. PC Power Switch

This switch controls the power of the built-in computer, turn on the computer before use the machine.

36. USB Port

This part provide the USB Ports to the built-in computer.

2.4 Hardware Installation

This section explains the installation steps with other hardware.



1. Check environment

Power supply

Power supply : 220 VAC

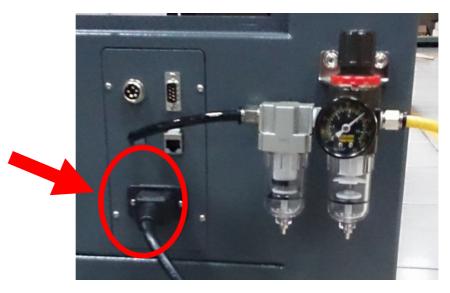
Environment

Temperature: 0 \sim 30 $\,^\circ\!\mathrm{C}$, No freezing

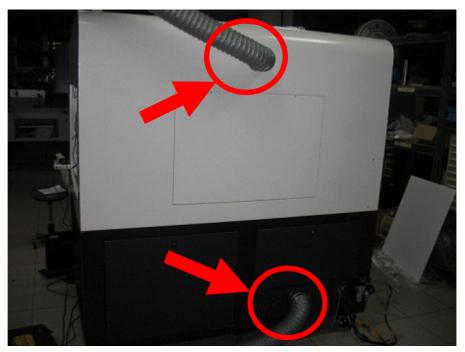
Relative humidity : 35 ~ 85 %

Other : Avoid to dust, dirt, oil, mist, strong vibration, or sudden temperature changes

2. Connect AC power cable



3. Connected the pipes from blower to machine.





4. Connect air tube from filter port to Air Compressor.

5. Connect RJ-45 Ethernet cable to machine. It provides the built-in computer Internet or LAN.



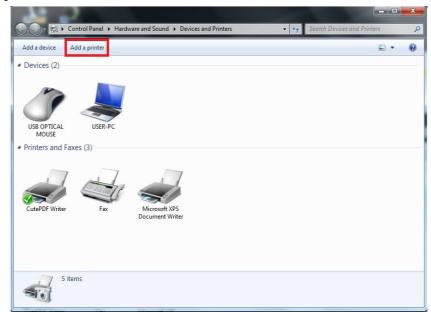
2.5 Driver Installation

2.5.1 Install Driver

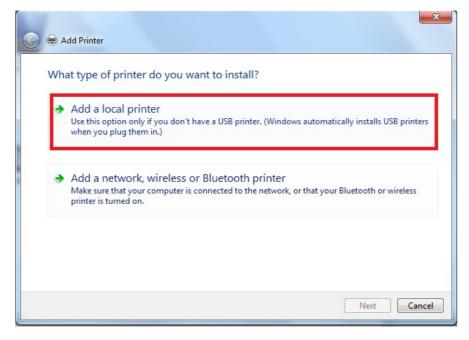
This section explains the installation steps for driver on computer.

1. Put the CD-ROM of installation into CD/DVD drive

2. Go to the [Printers and Devices] window and select the [Add a printer] option



3. Select [Add a local printer], then click the [Next] button



4. Select [Use an existing port], then select [USB00*(USB printer support)], then click the [Next] button. (* means the port number of the USB printer support port number).

Choose a printer port		
A printer port is a type of con	nection that allows your computer to exchange inform	ation with a printe
Ose an existing port:	USB001 (Virtual printer port for USB)	
Create a new port:		
Type of port:	CutePDF Writer Monitor	

5. Select [Have Disk...].

Install the printer dr		lick Windows Update to see more	models
		tion CD, click Have Disk.	
Manufacturer	Printe	ers	
Brother Canon Epson Fuji Xerox	🛱 Br	other DCP-116C other DCP-117C other DCP-128C other DCP-129C	
This driver is digitally Tell me why driver si	r signed.	Windows Update	Have Disk

6. Select [Brow		×
	Insert the manufacturer's installation disk, and then make sure that the correct drive is selected below.	OK Cancel
	Copy manufacturer's files from: A:\	Browse

7. Please select the .inf install file.

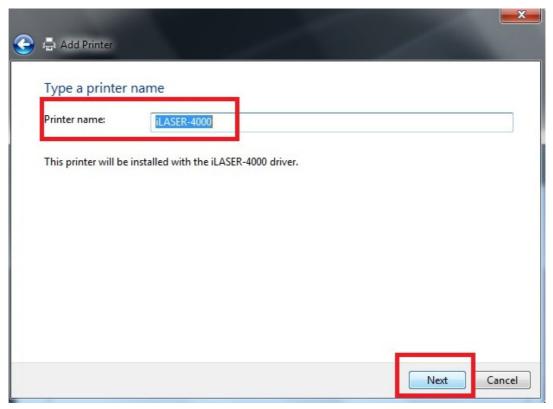
Please select the file which named match the machine name to install.

Date modified 12/13/2012 9:46 AM	T
12/13/2012 9:46 AM	-
	F
12/13/2012 9:45 AM	F
9/1/2011 11:50 AM	S
Open	

8. Select [Next].

Install	I the printer driver
-	Choose your printer from the list. Click Windows Update to see more models. To install the driver from an installation CD, click Have Disk.
Printe	rs ISER-4000
▲ Tł	nis driver is not digitally signed! Windows Update Have Disk

9. You can define the name of machine, after the setting, click [OK].



10. Select [Install this driver software antway].



11. Please select [Do not share this printer].

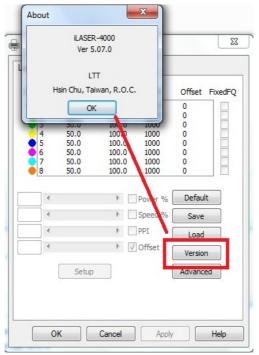
Add Printer	
Printer Sharing	
	this printer, you must provide a share name. You can use the suggested name or share name will be visible to other network users.
O not share this	printer
Share this printer	so that others on your network can find and use it
Share name:	iLASER-4000
Location:	
Location	
Comment:	

12. Click [Next].

If you want this machine to be the default printer, then please select **[Yes]**, or please select **[No]**. If there are no other drivers installed on your computer, the SLC-D2 will automatically be set as your default printer.

)	Add Printer
	You've successfully added iLASER-4000
	Set as the default printer
	To check if your printer is working properly, or to see troubleshooting information for the printer, print a test page.

13. Go to [Printer and Devices] page and right click [SLC-D2] then select [Properties]. Then click [Version] to confirm the version of the driver.



2.5.2 Uninstall Driver

- 1 Go to [Devices and Printers] window
- 2 Select the Printer you want to delete and then press the [Delete this Printer] button.

							×
	Control Panel 🕨	Hardware and Sound 🕨	 Devices and Printers 	- ↓	Search Devices and Pri	nters	P
Add a device	Add a printer	See what's printing	Print server properties	Remove device		-	?
Devices (3)				\sim			
USB OPTICAL MOUSE	USER-PC	Mass Storage Device		1			Ŧ
CutePDF Write		Microsoft XPS Document Writ					
•							
il and a second	Mo	ate: 🥑 🤽 del: iLASER-4000 ory: Printer	Status: 0 document(s) in queue			

3 Press the [Yes] button.

7	Are you s	ure you w	ant to ren	nove this d	levice?
9	iLASER-4000				
			_		
			1	Yes	No

4 After the uninstall process, please select random printer then select [Print server properties].



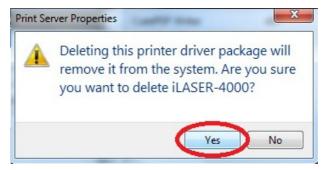
5 Switch to [Drivers] tab and choose the Printer you have just deleted. Press [Remove] button.

USER-PC	unity Advanced	
Installed printer drivers: Name	Processor	Туре
CutePDE Writer	v64	Type 3 - User Mode
iLASER-4000	хб4	Type 3 - User Mode
Add	Remove	Properties

6 Select [Remove driver and driver package], then click [OK].

Do you want to remove	the driver(s) only, or remove
	package(s) from your system?
Remove driver or	ıly.
Remove driver ar	nd driver package.
ОК	Cancel

7 Click [Yes] to confirm the uninstall process.



8	click [Delete].	Remove Driver Package	
		Driver package information collected.	
		The following package(s) will be deleted: Ittilaser-4000.inf (x64) The following driver(s) will be deleted: iLASER-4000 (x64)	*
		Delete Cancel	Ŧ

9 Click [OK] to close the window after remove the driver.

ackage o			
	4000 was n er-4000.inf	oved.	

- **10** Close the [Devices and Printers] window.
- 11 Go to [Computer] > [C:] > [LTT], then remove all files under the folder.

ganize 🔻 🛛 Include in library 👻 🗧	Share with 🔻 🛛 Burn 🛛 New folder			
' Favorites	Name	Date modified	Туре	Size
🔲 Desktop 🖟 Downloads	LTTILASER-4000	12/17/2012 4:06 PM	Configuration sett	4 KB

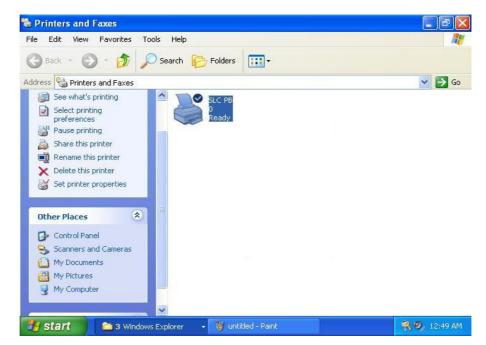
Chapter 2 Installation **2.5.3 Change USB Cable to Another Port**

This section explains that the steps when change USB port.

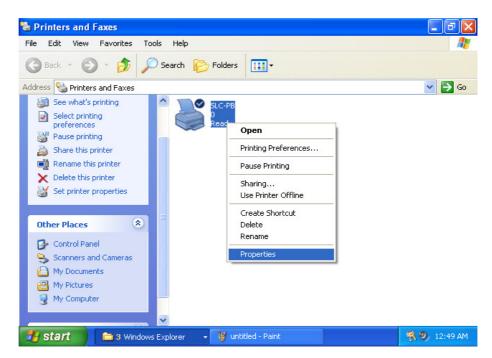


Once you contact the USB Cable to computer, we strongly suggest that do not change it to another USB port. If you must change USB cable to another port, you have to also change the printer settings of SLC-D2. If this happens, please follow next steps.

- 1. Connect the USB cable to another port well with SLC-D2.
- 2. Open [Devices and Printers] window



3. Right click SLC-D2 and select [Properties]



4. Switch to **[Ports]** label. Switch the **[USB00*]** which is belong to the new port and click **[OK]**.

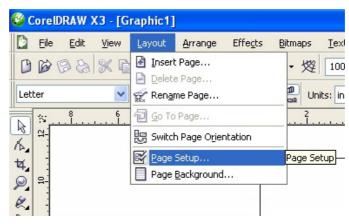
SLC-P	B Prope	rties			?
General	Sharing	Ports	Advanced	Color Managemer	nt Security
S	SLC-PE				
<u>P</u> rint to checke		ng port(s)	. Documents	s will print to the first	free
Port	De	scription		Printer	~
□ FI □ II	0M4: Ser LE: Prir 5B002 5B001	nt to File Virtual	orinter port fr printer port fr		×
A	dd Port		<u>D</u> elete I	Port Cor	nfigure Port
	ble bidirect ble printer		port		
		OK	Canc	el <u>A</u> pply	Help

5. Done.

Chapter 2 Installation 2.6 CoreIDRAW Setup

It is strongly recommended to keep the graphic software's page size the same with driver's page size before you begin editing files. Here you will learn how to setup your page and learn how to keep those settings that you don't have to setup again next time. If you are a autocad user, please see section <u>2.7</u>.

Go to	[Layout]	→ [Page	Setup]
-------	----------	-----	------	--------



Modify [Width] and [Height] according to work area (See <u>Appendix 1</u>). Click [Save Custom Page] button.

Options			
. Workspace	Size		
🖻 · Document ···· General	💿 Normal	Paper OLabels	
Size 	Paper:	O Portrait O Landscape	
Label Background	Width:	600.0 😴 millimeters 🔽	
Guidelines Grid	Height:	500 🌧 millimeters]
Rulers Styles	Resize	current page only	
Save ⊕ Publish To The Web	Resolution	: 300 💌	
😟 Global	Bleed:	0.0 🔶 millimeters	
	Set Fro	m Printer Save Custom Page	
	Add Pa	ge Frame	
<			
		OK Cancel	Help

Name this paper type. It is recommended to name with the machine type. Then click **[OK]** to save.

ОК	Cancel
	ОК

Click **[OK]** to complete the paper size adjustment.

Options		
🕀 Workspace	Size	
General	Normal Paper Clabels	
- Page Size	O Portrait 💿 Landscape	
Layout	Paper: SLC-PB	
Background	Width: 600.0 🔿 milimeters 🗸	
Grid	Height: 500.0 imillimeters	
- Rulers - Styles	Resize current page only	
	Resolution: 300	
⊡ Global	Bleed: 0.0 🚔 millimeters	
	Set From Printer Delete Custom Page	
	Add Page Frame	
< >		
	OK Cancel He	lp]

Next time you can select template style while you create new file.

🥝 CorelDRAW	X3 - [G	raphic1]								. 7)
📔 <u>F</u> ile <u>E</u> dit	⊻iew	Layout	Arrange	Effe <u>c</u> ts	<u>B</u> itmaps	Text	T <u>o</u> ols	Window	Help		- 8
	8 % 🖻		• √∑ -		良・炎	∦ 200%	~				
Custom	~	10 500.	0 mm		1 🙆 L	Units: millin	neters	•	2.54 mm	A V	^Q x 6.35 ∩
Envelope Monars Envelope Check DL German Fanfold German Legal Fe Japanese Post C Japanese Return AS Extension Half Letter Goverment Lega Goverment Lega (Soverment Lega Photo Card B0 (JIS) B1 (JIS) B3 (JIS) B3 (JIS) B3 (JIS) B3 (JIS) B4 (JIS) B4 (JIS) B4 (JIS) B3 (JIS) B4 (JIS) B4 (JIS) B4 (JIS) B4 (JIS) B4 (JIS) B4 (JIS) B5 (JIS) B4 (infold ard h Post Caro l er (300) (420)	HII.	<u>9</u> .						400		
SLC-PB		- N	Page 1		<						
(-193.178, 808.3	195) Next	click for I	Drag/Scale; :	5econd click	(for Rotat	e/Skew; Dl	⊘ (ی bl-cli				×
🎒 start	ø	0	C 2 Wind	ow 👻	🥝 Corel	DRAW	12	- Paint		R 9,	1:29 AM

Here you will learn how to setup the page and print setting on AutoCAD.

1. Page And Layout Setup

Open the AutoCAD. Type **[limits]** on the command line then press **[Enter]** key.

Command:	COMMAND	LINE
Command:	limits	
18.4024, 12.47	16, 0.0000	SNAP GRID ORTHO POLAR OSNAP OTRACK DUCS DYN LWT MODEL

Then press [Enter] key to set the bottom left corner to [0,0].

Reset Model space 1	imits:
Specify lower left	corner or [ON/OFF] <0.0000,0.0000>:
32.4051, 12.9990, 0.0000	SNAP GRID ORTHO POLAR OSNAP OTRACK DUCS DYN LWT MODEL

Setting the top right corner according to work area (See <u>Appendix 1</u>). Then press **[Enter]** key.

	Specify	lower	left	corner	or	[ON/0]	FF] <	0.000	0,0.0000>:	
	Specify	upper	right	corne	r <1	2.000	0,9.0	000>:	1000,600	
65.5797, 13.7021, 0.0000 SNAP GRID ORTHO POLAR OSNAP OTRACK DUCS DYN LWT MODEL										

Turn on the grid by typing **[grid]** on the command line or turn on directly by pressing the **[GRID]** button which located under the command line. The grid shows the page area so that can help user to see boundary.

Command:	Command: <grid on=""></grid>								
Command:									
85.6856, 2.9547	, 0.0000	SNAF	GRID	ORTHO POLAR OSNAP OTRACK DUCS DYN LWT MODEL					

Choose [File] \rightarrow [Save as]. Then select [Files of type] as [*.dwt]. Set file name as machine type and then press [Save] button to save the Template style.

Save in:	C Template	- + R Q		⊻iews ▼	Too
	名稱 🔺	大小	eview		
	🛅 P T W Templates				
History	C SheetSets				
	acad	67 KB			
	even acad 3D	213 KB			
-	wij acad -Named Plot Styles	67 KB			
我的交件	imacad -Named Plot Styles3D	213 KB			
1	acadiso 🔤	68 KB			
225	w acadiso3D	214 KB			
Favorites	acadISO -Named Plot Styles	68 KB			
- 34	acadISO -Named Plot Styles3D	213 KB			
	Tutorial-iArch	86 KB			
FTP	Internal-iMfg	87 KB			
PIE	Tutorial-mArch	90 KB 90 KB			
	Iutorial-mMfg	0.000			
-	<	>			
Desktop	Undate sheet and view	w thumbnails now			
10	File name: SLC-PB			× (Sav

Write down some description for the template and set the measurement unit system you want.

Template Options	? 🛛
Description Normal English (feet and inches) drawing template. Uses Color Dependent Plot Styles.	OK Cancel Help
Measurement	
Metric 🗸 🗸	
New Layer Notification	
Save all layers as <u>unreconciled</u>	
Save all layers as <u>r</u> econciled	

You can select the template file you created whenever open AutoCAD. Next time when you use the same page size, you can use the template file directly so that you don't have to setup the page anymore.

2. Print Setting

Go to [File] \rightarrow [Plot]. When the [Plot] window shows, select printer driver and click [Properties] button.

	del	?
		i Learn about Plotting
Page setup		
N <u>a</u> me:	<none></none>	Add <u>.</u>
Printer/plot	er	
Na <u>m</u> e:	SLC-PB	Properties
Plotter: Where:	SLC-PB SHARP AR-M276 FAX NetFaxPrinter	
Description	Microsoft Office Document Image Wi CutePDF Writer	niter 🧧
	Withort/Enson LO-680C 4F	
Plot to f	ile Wilttprt/HP LaserJet 5100 PCL 6	T
Paper size		Number of copies
Paper size		Number of copies
<u></u>		
A4 Plot area		Plot scale
A4 Plot area What to plo	ot:	
A4 Plot area	ot:	Plot scale
A4 Plot area What to plo Display		Plot scale Image: Scale in the scale Scale in the s
A4 Plot area What to plo Display Plot offset (origin set to printable area)	Plot scale V Fit to paper Scale: Custom 1 mm V =
A4 Plot area What to plo Display		Plot scale Image: Scale in the scale Scale in the s
A4 Plot area What to plo Display Plot offset (origin set to printable area)	Plot scale V Fit to paper Scale: Custom 1 mm V =
A4 Plot area What to plo Display Plot offset (X: 0.00	origin set to printable area) mm	Plot scale I Ifit to paper Scale: Custom 1 mm 6.369 units

Select [Modify Standard Paper Sizes] on the tree-list box. Select the option which starts with [LTT...]. Press [Modify] button.

f Plotter Configuration Editor - SLC-PB 🛛 🛛 🛛
General Ports Device and Document Settings
 SLC-PB Source and Size <size: letter=""></size:> Media Destination <default></default> Graphics Custom Properties Custom Paper Sizes & Calibration Custom Paper Sizes Modify Standard Paper Sizes (Printable Area) Filter Paper Sizes Potter Calibration Potter Calibration PM File Name <none></none>
Modify Standard Paper Sizes Custom Size PRC Envelope #10 Rotated PPC Envelope #0 Rotated Width: 600.0mm Height: 500.0mm LR: 3.2mm, 3.2mm Printable Area: 593.7mm x
Import
OK Cancel Help

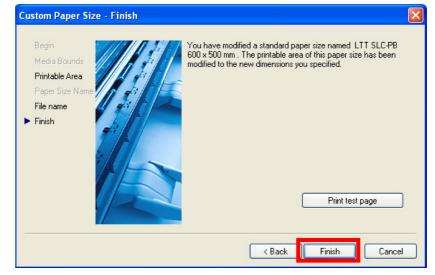
Modify **[Top]**, **[Down]**, **[Left]** and **[Right]** to zero, press **[Next]** button to continue.

Begin Media Bounds	The Preview tile indicates the printable area based on the currently selected paper size. To modify the non-printable area, adjust Top, Bottom, Left and Right edges of the page.
 Printable Area Paper Size Nar File name Finish 	NDTE: Most drivers calculate printable area from a specific me measurement away from the edge of the paper. Some drivers, such as Postscript drivers, measure printable area from the actual edge of the paper. Verify that your plotter is capable of plotting from the actual dimensions you specify.
1 111531	Iop: 0 > Bottom: 0 > Left: 0 > Bight: 0 >

Press [Next] button to continue.

<mark>Custom Paper Size</mark> Begin Media Bounds	- File name The new paper size will be stored in a PMP (Plotter Model Parameters) file. Enter a name for the PMP file you are saving.
Printable Area Paper Size Name File name Finish	PMP <u>File</u> name : SLC-PB
	< <u>B</u> ack <u>N</u> ext > Cancel

Press [Finish] button to continue	Press	[Finish]	button	to	continue.
-----------------------------------	-------	----------	--------	----	-----------



Select [Custom Properties] and click [Custom Properties] button at middle.

f Plotter Configuration Editor - SLC-PB	
General Ports Device and Document Settings	
SLC-PB Media Custom Properties Custom Properties Custom Properties Custom Paper Sizes Modify Standard Paper Sizes (Printable Area) Filter Paper Sizes Plotter Calibration Plotter Calibration PMP File Name <none></none>	
Access Custom Dialog Press the following button to access the device driver-specific user-interface.	
Import Save As Defaults OK Cancel <u>H</u> elp	

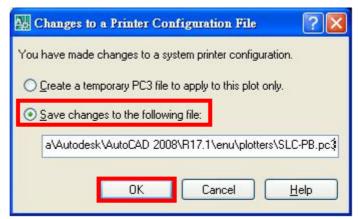
Modify Laser settings if need. Press **[OK]** to finish driver setting.

Laser	Job	Page	Power Scal	e	
Color	Po	wer %	Speed %	PPI	Default
		50.0 50.0	100.0 100.0	1270 1270	Save
		50.0	100.0	1270	
- 4	ŧ.	50.0	100.0	1270	Load
85	9	50.0 50.0	100.0 100.0	1270 1270	
7		50.0	100.0	1270	
08		50.0	100.0	1270	English 🚬
_	<u>त</u>			Power % Speed %	Version
				PPI	Advanced
		Setup			Custom Lang.

General Ports Devi	ce and Document Settings
SLC-PB	
🖃 🛃 Media	l Size <size: letter=""></size:>
	tination <default></default>
🗄 🌄 Graphics	
약을 Custom Proper 약을 User-defined P	aper Sizes & Calibration
🗖 🖸 Custom Pa	per Sizes
Modify Sta	andard Paper Sizes (Printable Area) r Sizes
Plotter Cal	
🖓 PMP File N	Name <none></none>
- Access Custom Dialog	
	Press the following button to access the device driver-specific user-interface.
100	
- U	Custom Properties
Import	Save As Defaults

Press **[OK]** to back to print setting.

Select [Save changes to the following file] and press [OK] to continue.



You will find the printer option that you just created (***.pc3**) on **[Name]** box. Please select the new printer instead of original in the future.

Plot - Ma	del	Learn about Plotting	
Page setup			
N <u>a</u> me:	<none></none>	Add]
Printer/plot	or		-
Na <u>m</u> e:	SLC-PB	Properties]
Plotter:	SLC-PB		4
Where:	NetFaxPrinter		
Description	· CutePDF Writer	8	
Plot to	Wittprt'Epson LQ-680C 4F jle Wittprt'HP LaserJet 5100 PCL 6	MM T	
Paper si <u>z</u> e		Number of copies	7
A4		✓ 1	
Plot area		Plot scale	
What to pl	ot:	Fit to paper	
Display	~	Scale: Custom	

Select [Plot style table] to acad.ctb. Press [Edit] button.

Plot - Model		? 🛛
Page setup		Learn about Plotting Plot style table (pen assignments)
Name: <none></none>	Add	None 🔽 🛆
Printer/plotter		- Stacad.ctb
Name: ØSLC-PB	Properties	DWF Virtual Pens.ctb
Plotter: SLC-PB - Windows System Driver - by Au Where: LPT1: Description: Plot to file	todesk	Grayscale.ctb Grayscale.ctb Screening 100%.ctb Screening 25%.ctb Screening 50%.ctb Screening 75%.ctb New
Letter	1	Plot with plot styles Plot paperspace last
Plot area	Plot scale	Hide paperspace objects
What to plot:	Fit to paper	Plot stamp on
Display	Scale: Custom	Save changes to layout
Plot offset (origin set to printable area) <u>X</u> : 0.00 mm □ Center the plot <u>Y</u> : 0.00	1 mm = 15 units Scale lineweights	Drawing orientation Portrait Landscape Plot upside_down
Preview	Apply to Layout OK	Cancel Help 🔇

Press **[Yes]** button to continue.

Questio	1	\mathbf{X}
2	Assign this plot style table to all la	youts?
	Yes No	

Use [Shift] key to help selecting all colors in [Plot styles] list. Set the [Linetype] to [solid] and the [Lineweight] to [0.0000 mm] Press [Save & close] button to continue.

💷 Plot Style Table Editor - acad.c	tb			? 🗙
General Table View Form View				
Plot styles: Color 240 Color 241 Color 242 Color 243 Color 244 Color 245 Color 245 Color 246 Color 247 Color 248 Color 248 Color 248 Color 249 Color 250		Use objec Dither: rayscale: Pen <u>#</u> : al pen #: 100	t color On Off Automatic Automatic	
Color 251 Color 253 Color 253 Color 254 Color 255		voapti <u>v</u> e:	On 00 mm t end style t join style	× × × ×
Add Style Delete Style	Edit <u>L</u> inewe	eights	<u>S</u> ave As	
Sa	ve & Close	Cance		<u>H</u> elp

Please follow the settings below. Switch to **[Plot Settings]** tab. Select the **[Plot scale]** to **[1:1]**. Select the **[Plot area]** to **[Limits]**. The **[Drawing orientation]** should be set to **[Landscape]**. Then Press **[OK]** to send file to machine.

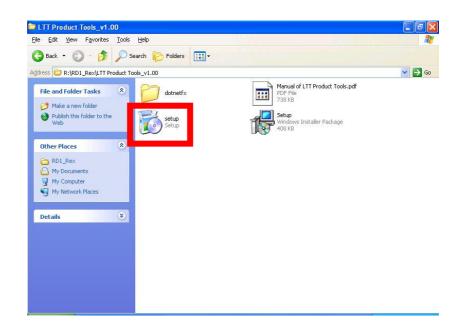
Plot - Mo	odel			? 🛛
Page setup			i Plot style table	Learn about Plotting (pen assignments)
N <u>a</u> me:	<none></none>	Add <u>.</u>	acad.ctb	
Printer/plott	ter		Shaded viewpo	ort options
Na <u>m</u> e:	SLC-PB	Properties	Sha <u>d</u> e plot	As displayed 🖌
Plotter:	SLC-PB - Windows System Driver - by Au	itodesk	Quality	Normal
Where:	LPT1:		DPI	300
Description			Plot options	ckground
Paper size		Number of copies	Plot objec	t lineweights
LTT SLC-P	28 600 × 500 mm	• 1	Plot with p	
Plot area		Plot scale	Plot paper	rspace last erspace objects
What to plo	ot:	Fit to paper	Plot stamp	
Limits		Scale: 111	Sa <u>v</u> e char	nges to layout
Plot offset ((origin set to printable area)	1 inches 💌 🚍	Drawing orient	ation
<u>×:</u> 0.0000	0000 inch	1 unit	O Portrait	
<u>Y</u> : 0.0000	inch	Scale lineweights	Landscape Plot upsid	
Preview)	Apply to Layout OK	Cancel	

2.8 LTT Product Tools

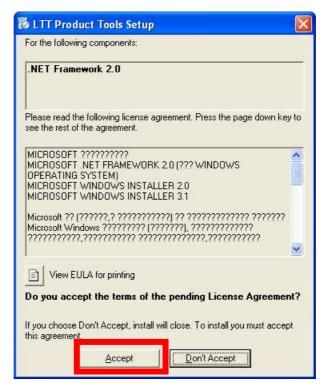
2.8.1 Install Procedure

LTT Product Tools is the software which can send prn or plt file, update firmware, and change the Ethernet settings. This section explains the installation steps on your computer.

1. Double click [setup.exe], (the file is included in the installation CD)

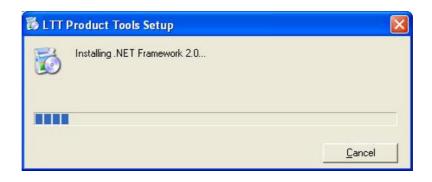


2. When you see the diagram below, please press the **[Accept]** key to go on. If not, please go to Step 4.



42

3. When you see the diagram below, please wait for some minutes.



4. When you see the diagram below, please press the **[Next]** key to go on.

🛃 LII Product Tools	
Welcome to the LTT Product Tools Setup Wizard	
The installer will guide you through the steps required to install LTT Product Tools on your co	imputer.
WARNING: This computer program is protected by copyright law and international treaties. Unauthorized duplication or distribution of this program, or any portion of it, may result in seve or criminal penalties, and will be prosecuted to the maximum extent possible under the law.	re civil
Cancel < <u>B</u> ack Ne	(t >

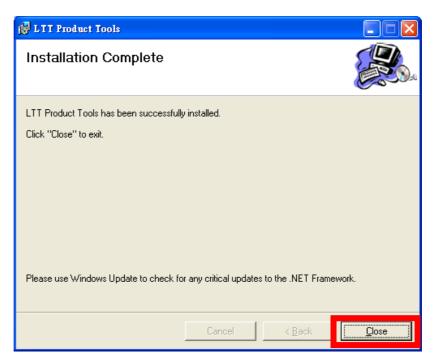
5. When you see the diagram below, please choose a position to install the software, or use the default value. And press **[Next]** key to go on.

🛃 LTT Product Tools	
Select Installation Folder	
The installer will install LTT Product Tools to the following folder. To install in this folder, click "Next". To install to a different folder, enter it be	slow or click "Browse".
Eolder: C:\Program Files\LTT Product Tools\	Browse
	<u>D</u> isk Cost
Install LTT Product Tools for yourself, or for anyone who uses this compu	ıter:
✓ Everyone ✓ Just me	
Cancel < <u>B</u> ack	<u>N</u> ext >

6. Press [Next] key to go on.

🛃 LTT Product Tools			
Confirm Installation			
The installer is ready to install LTT Produc	ct Tools on your compute	er.	
Click "Next" to start the installation.			
	Cancel	< <u>B</u> ack	<u>N</u> ext >

7. Press **[Close]** key to finish the setup procedure.



After the setup procedure, you can open the software from two shortcuts. The first one locates on the [Desktop], and the second one is placed in the [Start Manu].



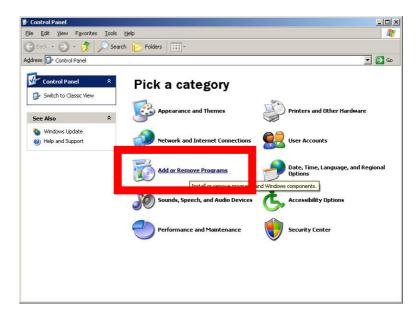
Chapter 2 Installation

2.8.2 Uninstall Procedure

1. Click [Start] →[Settings] → [Control Panel]

	ients 🔸	
Setting	gs 🔸	🛃 Control Panel
Search	•	Network Provides options for you to customize the appearance and Printers afunctionality of your computer, add or remove programs, and
	nd Support	Taskbar and startments
SMOPUJ Run		
	wwn	
🛃 Start 🖸 Cut	ting Improver 🛛 🔰 d	009 - Paint

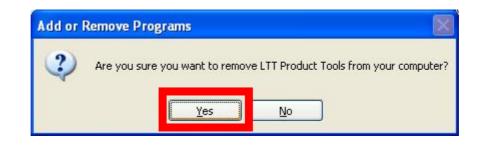
2. Double click [Add or Remove Programs]



3. Click **[LTT Product Tools]** → Press **[Remove]** key

	Currently installed programs:	Show up <u>d</u> ates	Sort by: Name		1
ange or emove	Mutodesk Express Viewer		Size	5.95MB	-
ograms			Size	18.77MB	
1	CorelDRAW Graphics Suite 12		Size	332.00MB	
d New	🖽 Design Tools - 2D Design		Size	4.25MB	
ograms	μ ₇ LTT Product Tools		Size	0.14MB	
4	Click here for support information.		Used (occasionally	
/Remove indows	To change this program or remove it from your comp	uter, click Change or Remove.	Last Used On Change	11/27/2008 Remove	1
ponents	Microsoft .NET Framework 2.0		Size	96.21MB	1
	間 MSXML 4.0 SP2 (KB927978)		Size	2.56MB	
Program	間 MSXML 4.0 SP2 (KB936181)		Size	2.62MB	
ess and efaults	👸 Sentinel System Driver				
	WitraEdit 10.10 (CN+TW) localized		Size	5.60MB	
	💕 Windows Installer 3.1 (KB893803)				
	🚖 Windows Live Favorites for Windows Live Toolbar		Size	1.83MB	
	🔊 Windows Live installer		Size	2.94MB	
	and Windows Live Messenger		Size	32.02MB	
	a Windows Live Sign-in Assistant		Size	1.30MB	

4. Please choose [Yes]

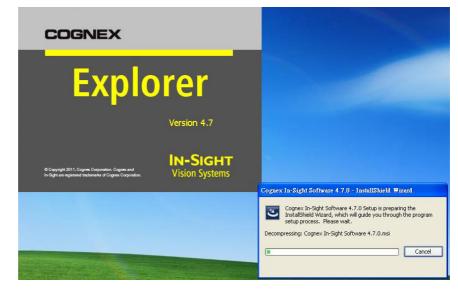


5. Done

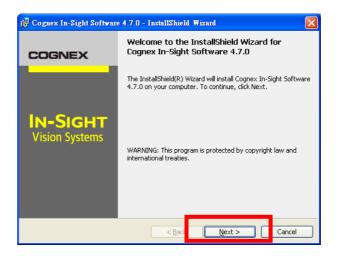
2.9 In-Sight Explorer Installation

2.9.1 Install Procedure

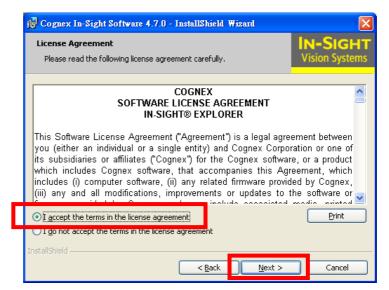
1. Please copy the file **[Cognex In-Sight Software 4.7.0.exe]** to your PC, and double click it. **(the file is included in install CD)**



2. Click [Next]



3. Choose [I accept the terms in the license agreement] and then click [Next]



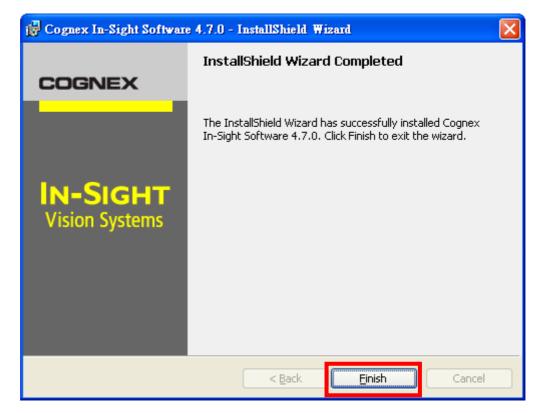
4. Key in the user name and organization. Then click [Next]

🙀 Cognex In-Sight Software 4.7.0 - InstallShield Wizard	
Customer Information Please enter your information.	IN-SIGHT Vision Systems
User Name: User	
Organization:	
, .	
InstallShield	
< <u>B</u> ack	ext > Cancel

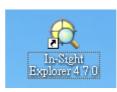
5. Choose Complete and press [Next]



- 7. Waiting for install procedure. When seeing blow window. Click **[Finish]** to finish install procedure for **In-Sight Explorer**.



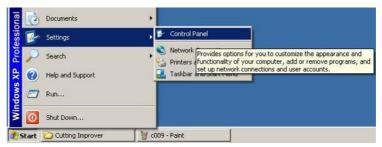
After the setup procedure, you can open the software from two shortcuts. The first one locates on the [Desktop], and the second one is placed in the [Start Manu].



Chapter 2 Installation

2.9.2 Uninstall Procedure

1. Click [Start] →[Settings] → [Control Panel]



2. Double click [Add or Remove Programs]

💌 🏓 Ge
💌 🄁 Ga
and Other Hardware
counts
me, Language, and Regional
its.
bility Options
/ Center

3. Click [Cognex In-Sight Software 4.7.0] → Press [Remove] key

🐻 Add or Rei	nove Programs		
	Currently installed programs:	Sort by: Name	~
Change or Remove	HautoCAD 2008 Network License Activation Utility	Size	5.18MB
Programs	G AutoCAD LT 2004	Size	143.00MB
-	Autodesk Express Viewer	Size	5.92MB
	🚓 Cognex In-Sight Software 4.1.1		279.00MB
Add <u>N</u> ew Programs	Click here for support information.	Used	<u>rarely</u>
G	To change this program or remove it from your computer, click Change or Remove.	Change	Remove
Add/Remove	B Microsoft .NET Framework 2.0	Size	87.94MB
Windows Components Set Program Access and Defaults	j∰ Windows Installer 3.1 (KB893803)		

4. Please choose [Yes]



2.10 AutoCCD Installation

2.10.1 Install Procedure

AutoCCD is the main control program for cutting with CCD camera. This section explains the installation steps to your PC.

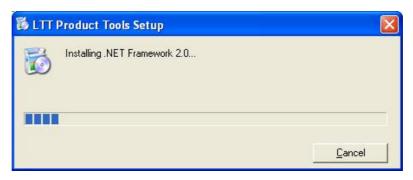
1. Please find the AutoCCD folder from installation CD. Double click [setup.exe]



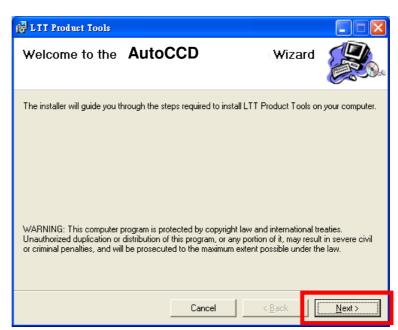
2. When you see the diagram below, please press the **[Accept]** key to go on. If not, please go to Step 4.

🐞 LTT Product Tools Setup 🛛 🛛 🔀
For the following components:
.NET Framework 2.0
Please read the following license agreement. Press the page down key to see the rest of the agreement.
MICROSOFT ????????? MICROSOFT .NET FRAMEWORK 2.0 (??? WINDOWS OPERATING SYSTEM) MICROSOFT WINDOWS INSTALLER 2.0 MICROSOFT WINDOWS INSTALLER 3.1
Microsoft ?? (??????,? ?????????) ?? ????????????
View EULA for printing
Do you accept the terms of the pending License Agreement?
If you choose Don't Accept, install will close. To install you must accept this agreement.
Accept Don't Accept

3. When you see the diagram below, please wait for few minutes.



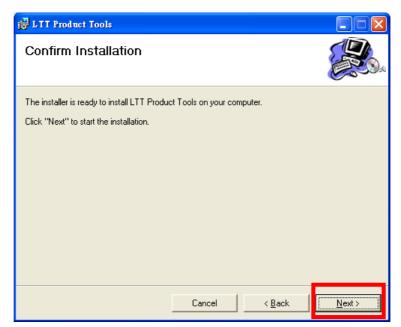
4. When you see the diagram below, please press the **[Next]** key to go on.



5. When you see the diagram below, please choose a position to install the software, or use the default value. And press **[Next]** key to go on.

🛃 LII Product Tools						
Select Installation Folde	r					
The installer will install LTT Product Tools to the following folder.						
To install in this folder, click "Next". To in	stall to a different fo	lder, enter it be	low or click "Browse".			
<u>F</u> older:						
C:\Program Files\LTTCorp\	B <u>r</u> owse					
			<u>D</u> isk Cost			
Install LTT Product Tools for yourself, or for anyone who uses this computer: Everyone Just <u>m</u> e						
	Cancel	< <u>B</u> ack	<u>N</u> ext >			

6. Press [Next] key to go on.



7. Press [Close] key to finish the setup procedure.

🛃 LII Product Iools	
Installation Complete	
LTT Product Tools has been successfully installed. Click "Close" to exit.	
Please use Windows Update to check for any critical updates to the .NET Framewo	rk.
Cancel < Back	<u>C</u> lose

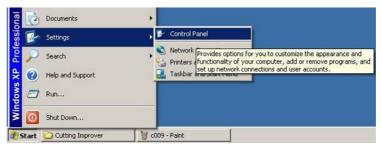
After the setup procedure, you can open the software from two shortcuts. The first one locates on the [Desktop], and the second one is placed in the [Start Manu].



Chapter 2 Installation

2.10.2 Uninstall Procedure

1. Click [Start] →[Settings] → [Control Panel]



2. Double click [Add or Remove Programs]

	iearch 🥟 Folders 🛛 📖 🗸	
dress 📴 Control Panel		⊻ ⇒
Control Panel *	Pick a category	
Switch to Classic View	Appearance and Themes	Printers and Other Hardware
🗞 Windows Update Ø Help and Support	Network and Internet Connections	
	Add or Remove Programs	Date, Time, Language, and Regional Options
	Install or remove program	and Windows components.
	Sounds, Speech, and Audio Devices	CS Accessibility Options
	Performance and Maintenance	Security Center

4. Click [AutoCCD] → Press [Remove] key

🐻 Add or Rer	nove Programs		
5	Currently installed programs:	Sort by: Name	~
Change or Remove	AutoCAD 2008 Network License Activation Utility	Size	5.18MB
Programs	I AutoCAD LT 2004	Size	143.00MB
Ch.	👹 Autodesk Express Viewer	Size	5.92MB
<u> 1</u>	🚓 Cognex In-Sight Software 4.1.1		279.00MB
Add <u>N</u> ew Programs	<u>Click here for support information.</u>	Used	rarely
F	To change this program or remove it from your computer, click Change or Remove.	Change	Remove
Add/Remove	B Microsoft .NET Framework 2.0	Size	87.94MB
Windows Components Set Program Access and Defaults	j∰ Windows Installer 3.1 (KB893803)		

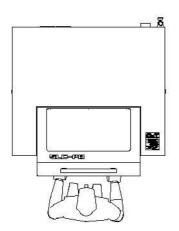
4. Please choose [Yes]

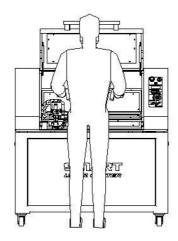


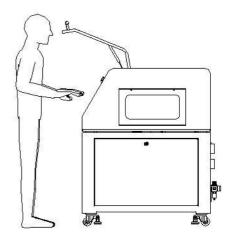
Chapter 3 Operation

3.1 Operator Position

This section shows the position when you operate machine.







3.2 Basic Operation Flow without CCD

This section explains the basic and common steps to operate SLC-D2. If you want to obtain more detail about operation, please see section 3.3 and 3.4.

Before process the steps in this section, please make sure that you have already finished all steps in chapter 2.

1. Get machine ready.

- Turn on the power.
- Wait for system start and homing process finishing.

2. Send file to machine.

- Open a drawing file or draw a new one on CorelDraw or AutoCAD.
- Execute the **[Print]** or **[Plot]** function.
- Modify the settings of driver. (See section <u>3.4</u>)
- Click **[OK]** to send file.

3. Adjust focal height (if necessary).

- Put the material on the table.
- Move the carriage above the material.
- Press () and select [Yes].

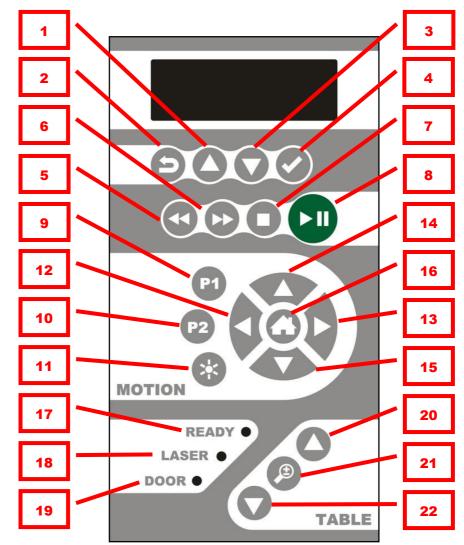
4. Execute file.

- Select the file on control panel.
- Make sure all LED indicators on control panel are on. (If not, see <u>chapter 5</u>)
- Press I to start file.

Machine Operation without CCD 3.3

This section explains the detail about how to operate SLC-D2.

3.3.1 Control Panel



- 1. Cursor Up / Increase Values
- 2. Escape
- 3. Cursor Down / Decrease Values 14. Move Carriage Forward (Y-)
- 4. Enter
- 5. **Previous File**
- **Next File** 6.
- 7. Stop
- 8. Run / Pause
- Move to P1 9.
- 10. Move to P2
- 11. Red Beam Switch/ Laser

- 12. Move Carriage Left (X-)
 - 13. Move Carriage Right (X+)
 - 15. Move Carriage Back (Y+)
 - 16. Homing
 - **17. Ready Indicator**
 - **18.** Laser Indicator
 - **19.** Door Indicator
- 20. Focal Lens Up
- 21. Auto Focusing
- 22. Focal Lens Down

1. Cursor Up / Increase Values

Move the cursor up or increase values.

2. Escape

Escape from sub-menu or sub-selection

3. Cursor Down / Decrease Values

Move the cursor down or decrease values.

4. Enter

Enter into sub-menu or confirm the selection.

5. Previous

Select previous file in file list.

6. Next

Select next file in file list.

7. Stop

Give up the file that is in pause mode. You can't stop file directly which is not in pause mode.

8. Run / Pause

Run the file when system is ready or in pause mode. Pause the file when it is running.

9. Move Carriage to P1

Move the carriage to the location of P1. The way to set location of P1, please see section 3.3.2

10. Move Carriage to P2

Move carriage to the location of P2. The way to set location of P2, please see section 3.3.2

11. Red Beam Switch / Laser

Turn on/off the red beam normally.

But if in the sub-menu of **[Alignment mode]** (See section <u>3.3.2</u>), this key will turn to emit the laser beam for alignment.



12. Move Carriage Left (X-)

Move the carriage left slowly when press this key shortly. If you want to move the carriage left faster, please press and hold this key.

13. Move Carriage Right (X+)

Move the carriage right slowly when press this key shortly. If you want to move the carriage right faster, please press and hold this key.

Chapter 3 Operation

14. Move Carriage Forward (Y-)

Move the carriage forward slowly when press this key shortly. If you want to move the carriage forward faster, please press and hold this key.

15. Move Carriage Back (Y+)

Move the carriage back slowly when press this key shortly. If you want to move the carriage back faster, please press and hold this key.

16. Homing

Move the carriage to home and reset the position of home if the carriage loses its position.



After the homing process, you have to press so that you can leave the homing page.

17. Ready Indicator

This indicator will be on when system is ready to run file and no file is in pause mode.

18. Laser Indicator

This indicator will be on when laser tube is ready for emission.

19. Door Indicator

This indicator will be on when all doors with interlocks are closed.

20. Focal Lens Up

Move the focal lens up slowly when press this key shortly. If you want to move the focal lens up faster, please press and hold this key.

21. Auto Focusing

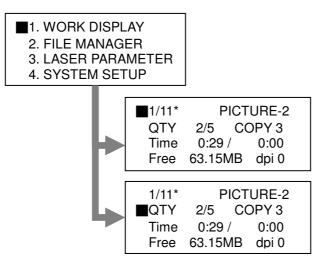
Automatically adjust the distance of lens and material to focus length.

22. Focal lens Down

Move the focal lens down slowly when press this key shortly. If you want to move the table down faster, please press and hold this key.

3.3.2 Operating Menu

1. Work Display



1/11*

Indicates that there are totally 11 files in memory, and the first file is selected at present. You can press and by to select files.

■ PICTURE-2 :

Indicates that the present file is named "PICTURE-2". You can name file on the tab "Page" of driver. (See section 3.4.3)

■ QTY 2/5:

Indicates that the file is limited to be executed 5 times at most, and system has finished 2 times. It will be invalid to press if system has finished 5 times. The way to modify this setting is described in section 3.4.3.

■ COPY 3 :

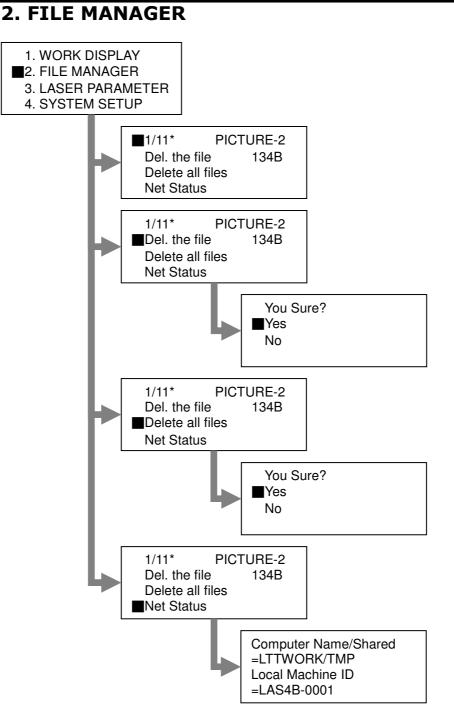
Indicates that the file will repeat 3 times automatically if you press \triangleright one time. The way to modify this setting is described in section <u>3.4.3</u>.

■ Time 0:29 / 0:00

The first timer records the pass time at present when a file is executed. The second timer will record the total time if the file has ever finished at one time

■ Free 63.15 MB dpi 0

If no file is executed, this line will display available memory. If a file is being executed, it will display the current power and speed settings.



■ 1/11* PICTURE-2

Like the definition in Work display, it indicates the number and name of files. You can press and provide to select files.

Del. the file :

This selection can delete single file which is selected at present.

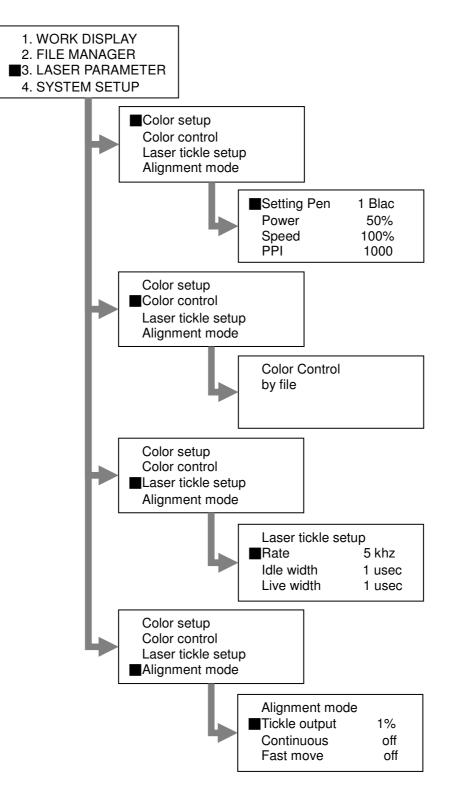
Delete all files :

This selection can delete all files in memory.

Net Status

This selection can show the settings of Ethernet.

3. Laser Parameter



Color Setup

The settings of each color can be adjusted under this selection after the file has been sent. It is not necessary to use because mostly all settings are defined in print driver before sending the file.

Setting Pen

Indicates the color you want to modify.

Power

Indicates the present power for setting pen. Its range is between $0 \sim 100\%$.

• Speed

Indicates the present speed for setting pen. Its range is between $0 \sim 100\%$.

• PPI

Indicates the number of pulses per inch for setting pen. It has six options, and they are 166, 200, 250, 333, 500, and 1000.

Color Control

There are two options: **[by file]** and **[by panel]**. **[by file]** means that the color settings are defined based on print driver for single file. **[by panel]** means that the color settings are defined based on **[Color Setup]** for all files.



Laser Tickle Setup

The laser tickle pre-ionizes the gas into a plasma state so that it is just below the laser threshold. Increasing tickle width beyond 1 μ s will add enough energy to the plasma to cause laser emission. By applying a laser tickle, the laser will respond predictably to laser signal even when there is considerable "off" time between applied pulses. It is recommended **NOT** to change the settings unless instructed to by a LTT technician.



Alignment Mode

This function is used for alignment of laser. It is recommended **NOT** to use this function unless instructed to by a LTT technician.

• Tickle output

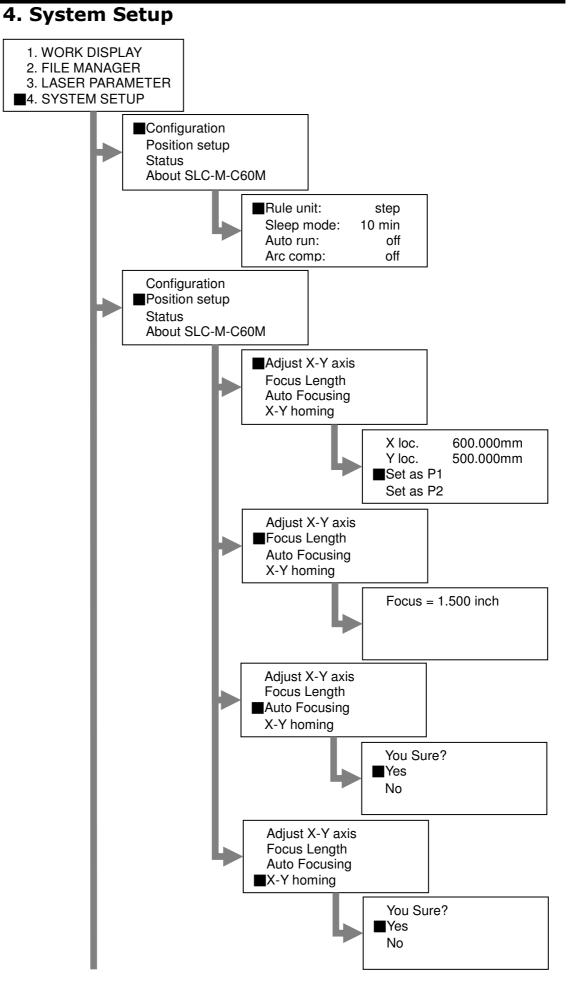
Indicates the power for laser tickle. Its range is between $0 \sim 100\%$.

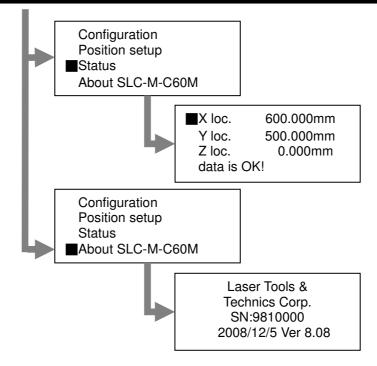
• Continuous

If this function is on and press *, the laser tickle will emit continuously until pressing * again. If this function is off, the laser tickle emits only when you keep pressing *.

• Fast move

If this function is on, you can move the carriage faster to nine position of working table by using motion control keys.





Configuration

Rule unit

This function can allow user to select the unit of length for system. There are three options: **step**, **millimeter**, and **inch**.

• Sleep mode

After the setting time, system will turn off the power of laser tube if there is still no file being executed.

• Auto run

This item has been deactivated.

• Arc comp

Compensates laser output power while cutting an arc.

Position setup

• Adjust X-Y axis

This function can allow user to set the position of **[P1]** and **[P2]**. Please move the carriage to the position that you want set for **[P1]** or **[P2]**. Then press **[Enter]** when the cursor is on the right side of **[Set as P1]** or **[Set as P2]**.

• Focus Length

This function can change focal length for auto focusing if you change the size of focus lens.

• Auto Focusing

Focusing the laser automatically. This function is the same with 😰

• X-Y homing

Move the carriage to home, and reset the position of home if the carriage loses position. This function is the same with \bigcirc .

66

Status

This function can show the position of carriage and table.

■ About SLC-D2

This function can show the firmware version and the machine serial number.

Chapter 3 Operation

3.4 Print Driver Operation

Because SLC-D2 is controlled by a standard Windows printer driver, you can create the drawing on your favorite graphics software based on Windows system. When you want to send files to SLC-D2, you can easy modify the driver settings just like using a desktop printer. There are four tabs in SLC-D2 driver programming: **Laser**, **Job**, **Page**, and **Power scale**.

3.4.1 Laser Tab

The **[Laser]** tab contains Power, Speed, and PPI for eight colors. Other functions enable user to save and load configuration files of driver settings, check driver information, tune machine, and customize the language of driver.

🍓 SLC-PE	Printing P	references		? 🗙
Laser J	ob Page	Power Scal	e	
Color	Power %	Speed %	PPI	
12	50.0 50.0	100.0 100.0	4064 4064	Default
2 3 4	50.0 50.0	100.0 100.0	4064 4064	Save
56	50.0 50.0	100.0 100.0	4064 4064	Load
7	50.0 50.0	100.0 100.0	4064 4064	
	1		Da	1
	1		Power % Speed %	
	_		PPI	Advanced
	Setup			
	ок 🗌	Cancel	App	ly Help

1. Color

SLC-D2 system can cut with eight groups of power, speed and PPI according to the color in drawing. If the color in drawing does not belong any one of these eight colors, then driver will choose a similar one according to its RGB values.

2. Power

This item can control the output power by setting the percentage of maximum power. For example, if the maximum power of Laser generator is 30 Watts, then setting 50% power will generate about 15 Watts of output power.

3. Speed

This item can control the output speed by setting the percentage of maximum speed. For example, if the maximum speed of cutting is 60 ips, then setting 50% speed will produce about 30 ips of cutting speed.

4. PPI

PPI means "Pulses Per Inch". This item controls the numbers of laser pulses in one inch. This item only affects vector cutting. It is recommended to decrease PPI for dull materials like wood and increased for polished materials like acrylic.

5. Setup

The settings of power, speed, and PPI can be modified by editing the text boxes and dragging the sliders. Then please click the setup button to save the new values for each setting.

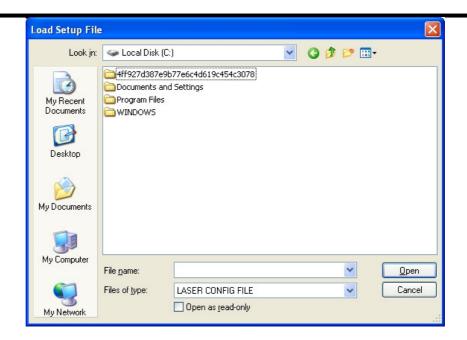
6. Save

Clicking this button will pop up a **[Save Setup File]** window. User can save all settings into a configuration file (*.lcf).

Save Setup File						
Savejn:	🍛 Local Disk (C:)]	~	0 🕫	۳. 🕫	
My Recent Documents Desktop	Hf927d387e9b Documents and Program Files WINDOW5	77e6c4d619c454c3078 Settings				
My Documents						
My Computer	File <u>n</u> ame:	LTT			~	Save
My Network	Save as <u>t</u> ype:	LASER CONFIG FILE			~	Cancel

7. Load

Clicking this button will pop up a **[Load Setup File]** window. User can load all settings from a configuration file (*.lcf).



8. Version

Clicking this button will show the version of driver.

9. Advanced.

Clicking this button will pop up a **[Advanced]** window. Enter the Password [Itt] and press OK, and user can set the Shape Adjustment from 9500 to 10500. This parameter allows the file to be enlarged or reduced the size between 95% and 105%. (Left bottom is the reference point, and the graphic's position and size will both be changed)

Advanced	X
Raster Shift Raster Shift -15 Shape Adjustment X axis Y axis Scale 10000 10000	Raster Direction Normal Left to Right Right to Left Password Keep Password OK
	OK Cancel

Chapter 3 Operation 3.4.2 Job Tab

The Job tab is divided into four sections: Job Mode and Cut & Engrave Setup.

💩 SLC-PB Printing	Preferences 🛛 🛛 🔀			
Laser Job Page	Power Scale			
Job Mode	Advanced Mode			
Normal Halftone	B&W Mode Vector Optimization Mirror Joint Curves			
16x16 ▼ C Rubber	Pulse Mode			
0 Offset	Count 1			
C Gray (3D)	Emit Period 0.01 ms Pause Period 0.01 ms			
Resolution Engrave type Ends				
4064 DPI Image: Second secon				
Cut & Engrave Setup				
Cut IV IV IV IV IV IV By Color Engrave IIIIIII C By Drawing				
OK Cancel Apply Help				

1. Job Mode

Normal

This mode uses the eight color settings to vector cut graphics drawn in the graphic software. (other mode is not applicable for SLC-D2 at this time)

2. Advanced Mode

Mirror

This mode will mirror the drawing horizontally. However, we suggest mirroring your drawing in the graphics program which will allow you to accurately preview the drawing before the job is sent to the machine.

Pulse Mode

This mode can be enabled for drilling holes. For details on holes drilling, contact technical support.

Vector Optimization

This mode can modify the working path base on positions of vector in the drawing, it can decrease working time.

Joint Curves

This mode can make cutting circle or arc faster and smoother.

3. Resolution

(This function is for Engrave, not applicable for SLC-D2 at this time)

4. Engrave type

(This function is for Engrave, not applicable for SLC-D2 at this time)

5. Cut & Engrave Setup

The Cut & Engrave Setup section allows the user to enable and disable certain functions of the machine. If the box next to Cut is unchecked the machine will disregard any potions of the graphics that instruct the laser to vector cut. Engraving mode is not supply at this time. For more precise control the boxes below each color allow the user to disable the cut options independently for each color.

By Color

When **[By Color]** is selected vector are cut according to the predefined color order. And vectors of the same color are cut in the sequence they have been drawn.

By Drawing

When **[By Drawing]** is selected all vectors are cut in the sequence in which they have been drawn, regardless of color.

3.4.3 Page Tab

The Page Tab is divided into four sections: **Page Setup**, **Job Title**, **Repetition**, and **Position Mode**.

SLC-PB Printing Preferences 🛛 🛛 🛛 🔀
Laser Job Page Power Scale
Page Setup Width 600.0 mm Height 500.0 mm
Job Title Repetition Copy 0 Quantity 0
Material Position Mode Material Setup Temporary Ref. Point Autoshift Relative Point Diameter 0.0
X axis 4064 DPI R axis High DPI
OK Cancel Apply Help

1. Page Setup

The Page Setup section includes the Width and Height information of machine.

2. Job Title

The Job Title input box allows the user to input a title for the job being sent to the machine. The title entered will be the top line of the job file on the display of the machine.

3. Repetition

The Repetition section allows the user to modify the setting of **[Copy]** and **[Quantity]** which will be shown on panel. (See section <u>3.2.2</u>)

4. Material

(This function is not support for SLC-D2 at this time)

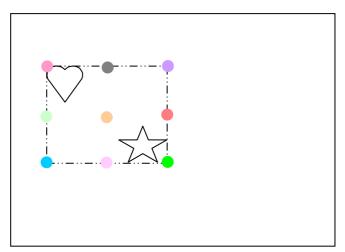
5. Position Mode

Temp Ref. Point

If this box is checked, the file will not execute in the position as application software. Otherwise, it will execute in the position where user determine on machine.

Relative Point

There are nine relative points. They are **Top Left**, **Top Middle**, **Top Right**, **Middle Left**, **Center**, **Middle Right**, **Bottom Left**, **Bottom Middle** and **Bottom Right**. Those points mean different positions on the boundary of drawing in application software.



Relative Point

There are nine relative points. They are **Top Left**, **Top Middle**, **Top Right**, **Middle Left**, **Center**, **Middle Right**, **Bottom Left**, **Bottom Middle** and **Bottom Right**. Those points mean different positions on the boundary of drawing in application software.

Stay Reference Point

If you want to stay on reference point after job finished, you can choose this option. This option can save your time when you want to use.



3.4.4 Power Scale

The Power Scale tab is divided into two sections, **Power Scale** and **Custom Power Scale**.

(This function is for Engrave, not support for SLC-D2 at this time)

3.5 LTT Product Tools Operation

3.5.1 File Transfer

You can send a output file (*.plt file or *.prn file) from drawing software (CAD or Corel Draw) to the machine through this software. And don't need to open any the drawing software. It is suitable for stable mass production.

*Note : LTT Product Tools provides only file transfer, it can't change any parameter of the drawing (speed, power, ect...).

1. Make a [*.plt] or [*.prn] file

Select [Print/ Plot to file] function after all parameters setting, select [Print] then you will get a [*.plt] or [*.prn] file

age setup					
Name: [<none></none>		-	Add	
rinter/plotter					
lame: [費 iLASER-4000.pc3		•	Properties	
Notter: I	ASER-4000 - Windows Syst	em Driver - by A	utodesk	an and a second second	
Where: L	ISB001			k—39.4° →	L
	N				25
Plot to file				xuuuuuuu	Ť.
aper size			N	umber of copies	
Custom Size			-	1	
nt					-
Seneral Color		epress 🤣 No I			
Seneral Color	LASER-4000			Preference	5
General Color Destination Printer: Page:	LASER -4000 Match orientation (Lando				5
General Color Destination Printer: Page: Status:	LASER-4000 Match orientation (Lando Default printer; Ready				5
General Color Destination Printer: Page:	LASER -4000 Match orientation (Lando				
General Color Destination Printer: Page: Status: Location:	LASER-4000 Match orientation (Lando Default printer; Ready			Use PPD	
Seneral Color Destination Printer: Page: Status: Location: Comment: Print range @ Current	LASER-4000 Match orientation (Lando Default printer; Ready US8001	cape) Cop		Use PPD	
General Color Destination Printer: Page: Status: Location: Comment: Print range @ Current @ Current	LASER-4000 Match orientation (Lando Default printer; Ready US8001 document © Documents page © Selection	cape) Cop	ies iber of copies:	Use PPD	B
Seneral Color Destination Printer: Page: Status: Location: Comment: Print range @ Current	LASER-4000 Match orientation (Lando Default printer; Ready US8001 document © Documents page © Selection	cape) Cop	ies	Use PPD	B
General Color Destination Printer: Page: Status: Location: Comment: Print range @ Current @ Current	LASER-4000 Match orientation (Lando Default printer; Ready US8001 document © Documents page © Selection	cape)	ies iber of copies:	Use PPD Print to file 1 Collat	B

2.	Open the	[LTT Product Tools]	l and select v	vour machine.
<u> </u>	open the		j unu serece	your muchine.

か LTT Product Tools	
File Help	
Printer	
Name: <u>¥2000</u>	•
Send File	
File Path:	
Send	

3. Click [...] and find your file then click [Send]

57 LTT Product Tools	
File Help	
Printer	
Name: <u>¥2000</u>	
Send File	
File Path:	
	Send

4. You will hear one long beep two short beeps showing that the file transfer has completed successfully.

3.5.2 System Upgrade

Generally, the file for upgrade will be provided from LTT. The file type is **[*.ice]**. While upgrade is processing and the power is turned off or the cable is disconnected, the SLC-D2 may not be upgraded for the moment. If this situation happens, please contact LTT.

1. Turn off the SLC-D2, and check that the SLC-M is connected with PC through USB cable.

2. Turn on the SLC-D2 and computer. Press and hold on the control panel right after turning on SLC-D2 until the following screen appears.



Froduct roois], and select th	e printei.
57 LTT Product Tools	- • ×
File Help	
Printer Name: V2000	•
Send File	
File Path:	
Send	

3. Run [LTT Product Tools], and select the printer.

4. Then select the **[*.ice]** file with **[...]** key, then press **[Send]** key to upgrade the firmware of SLC-D2.

5. You will hear two short beeps along with the following display, showing that the upgrade has completed successfully.



6. Press Son the Control Panel and you will hear a beep after which SLC-M returns to main menu.

7. Check the firmware version in the 4^{th} line of the **[ABOUT]** submenu (See section 3.3.2).

3.6 Basic Operation Flow with CCD

3.6.1 Calibration flow

This section explains the calibration steps before operate SLC-D2 with CCD. If you want to obtain more detail about operation, please see section 3.7 and 3.8. Before executing the steps in this section, please make sure that you have already finished all steps in chapter 2.

1. Get machine ready.

- Turn on the power.
- Wait for system start and homing process finishing.

2. Link computers, connectivity and language settings

- Check the connection between PC and machine
- Turn on the PC
- Execute AutoCCD.exe
- Go to [communication setting] and type the password [ltt].
- Select the language : English, Traditional Chinese, Simplified Chinese, Korean.
- Select RS232 connect port.
- Select the laser machine type.

File <u>S</u> etting Help		CCD Task Control CCD Setting
Address : 169.254.8.204 User: admin Password: Current Job :	IF Show Sheet IF Show Image IF Online IF Live	System securing Port COM1 Language Selection : English Security Data Bits 8 Parity None Stop Bits 1 Kot Disable
		Machine Type C SLC SLC-M C ILS or iLlaser Series ILLaser 3000 Save Browse

3. Adjust focal height of laser focus lens (if necessary)

- Put the material on the table.
- Move the carriage above the material.
- Press () and select [Yes].

4. Adjust the right focus of the CCD(if necessary)

- Move the CCD to see any pattern
- Adjust the working distance until image in CCD monitor is clear.

5. Preparation steps for CCD calibration.

- Put a A4 paper at the center of the working area. Make sure the paper will not be moved during the whole calibration.
- Turn on the laser power key.
- Press the **Connect** button and let the AutoCCD connects with CCD.
- Please DO NOT select the [online] function to avoid the error while calibration.



- Go to AutoCCD / File / Open Job. Open [Calibration_Circle_200.job]
- Go to AutoCCD / CCD Setting tab. Key in the Password with [LTT].



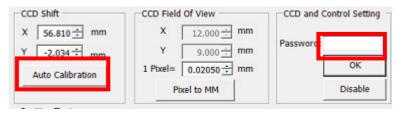
6. Do the [Pixel to MM] calibration.

- Press [Pixel to MM] button.
- The AutoCCD will automatically send a **P2MM.prn** file to the machine and then marks two circle on the A4 paper.
- AutoCCD will automatically move the CCD to get the image, then calculate the pixel to millimeter transform constant.
- Finally you will see the number of [1 Pixel= mm] will be updated by AutoCCD.
- You can do it again. Please don't move the marked paper, and turn the laser power key off. Then press [Pixel to MM] button again. It will do the above processes all over again.

CCD Shift	CCD Field Of View	CCD and Control Setting
X 56.810 ÷ mm	X 12.000 - mm	
Y -2.034 ± mm	Y 9.000 ± mm	assword:
Auto Calibration	1 Pixel= 0.02050 + mm	ОК
	Pixel to MM	Disable

7. Do the [Auto Calibration] calibration.

- Press [Auto calibration] button.
- The SLC-D2 will automatically send a Shift.prn file to the machine and then marks a circle on the A4 paper.
- AutoCCD will automatically move the CCD and get the image, then calculate the shift parameters constant.
- Finally you will see the number of **[CCD Shift]** will be updated by AutoCCD.
- You can do it again. Please don't move the marked paper, and turn the laser power key off. Then press [Auto calibration] button again. It will do the above processes all over again.



3.6.2 Operation Flow with CCD

This section explains the basic and common steps to operate SLC-D2 with CCD. If you want to obtain more detail about operation, please see section 3.7 and 3.8. Before executing the steps in this section, please make sure that you have already finished all steps in chapter 2.

1. Get machine ready.

- Turn on the power.
- Wait for system start and homing process finishing.

2. Get PC ready

- Check the connection between PC and machine
- Turn on the PC
- Execute AutoCCD.exe

3. Adjust focal height (if necessary)

- Put the material on the table.
- Move the carriage above the material.
- Press () and select [Yes].

4. Adjust the right focus of the CCD(if necessary)

- Move the CCD to see any pattern
- Adjust the working distance until image in CCD monitor is clear.

5. Setting drawing parameter in AutoCCD

- Go to AutoCCD / CCD Setting tab
- Select the [Calibration] mode.
- Go to AutoCCD / CCD Task Control tab
- Load drawing file
- Setup Mark distance

- Setup two point setting
- Setup start point
- Setup Matrix (if necessary)

6. Start AutoCCD procedure

- Select printer
- Click to start CCD task

3.7 AutoCCD Operation

AutoCCD is the main control program for cutting with CCD. It is to find reference marks of work piece, then re-calculate offset and rotation of the drawing to fit the new location of work piece.

This section explains functions of AutoCCD and how to use them.

3.7.1 Controls

Address: The CCD IP address. You need to enter the password in [CCD Setting]
 → [CCD and Control Setting] to change it.(See section 3.7.1.1 for more detail)

2.User & Password: User name and password for CCD control account. You need to

enter the password in [CCD Setting] → [CCD and Control Setting] to change it.

User name can use <admin> or <operator>. The default password is empty. If you need to use password to control, you have to use In-sight Explorer, go to Sensor/User List to modify the settings.

Generally use <operator> can get a easy view of job. For <admin> user, you can use <open job> and <save job as> in the File tab.

For <operator> user, you can only use <open job>.

147 AutoCCD			
File Setting Help			
Open Job			
Save Job As Load Recipe	Show Sheet	(A)	
Save Recipe As	- Show Image		
Exit	Online		
	E Livo		

3. Show Sheet: For <admin> user, it will turn on or off the sheet in CCD monitor. For <operator> user, it will turn on or off the customer view in CCD monitor.

4. Show Image: Show the CCD Image in CCD monitor.

5. Online: Make the CCD function working. You can see the real time result of pattern position and image in CCD.

6. Live: See the real time image from CCD.

7. Zoom in: Zoom in the CCD image in CCD monitor.

8. Zoom out: Zoom out the CCD image in CCD monitor.

9. Connect: Connect to the CCD device. Before connection, please check the setting of CCD IP address and user account.

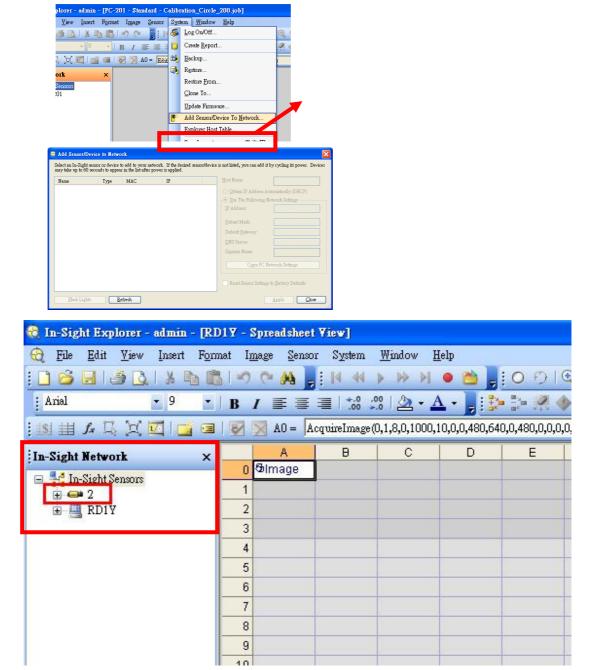
10. Zoom to fit: Zoom in/out the image to fit the vision zone of the CCD Monitor.

11.Current Job: Press this button to show what current job is loaded in the CCD.

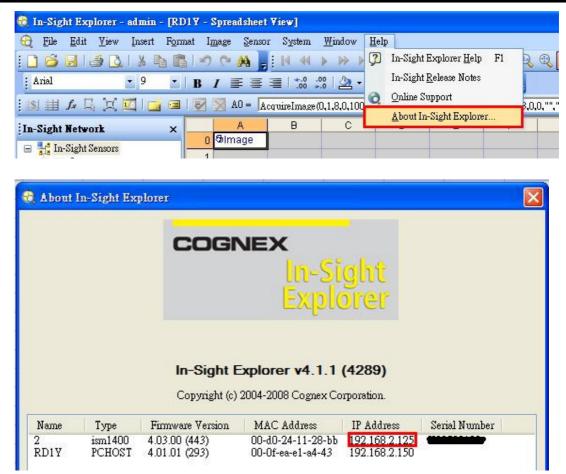
3.7.1.1 Find the CCD IP address

 When connecting to CCD, CCD device will use DHCP to get an IP address. When CCD connection is all right, In-sight Explorer will show the device in [In-Sight Network]. You can press [Ctrl]+[Shift]+[1] to show [In-Sight Network] window.

If you still can not find a CCD device, then you can go to **[System / Add Sensor/Device To Network]**, press the **[Refresh]** to search the CCD.



2. When CCD device is connected. Chick [Help]->[About In-Sight Explorer] to see the IP address of CCD device.



3.7.1.2 Setup CCD IP address

Open In-Sight Explorer, go to **Sensor / Network settings**. It will open a Network Settings window.

You can change the IP address of the CCD device.

PC-201 - Network Sett	ings		
<u>H</u> ost Name:	PC-201	Protocol Services	
Use DHCP Server		Max Connections:	4 🤤
IP Address:	192.168. 2.115	Idle Timeout:	120 🜲
Subnet Mask:	255.255.255.0		
Default Gateway:		Real-time Ethernet Protocols	
DNS Server:		• EtherNet/IP	
D <u>o</u> main Name:	ltt.local	O PROFINET	Settings
DHCP <u>T</u> imeout:	60 🔷	SLMP/MC Protocol Scanner None	Settings
- Telnet			
Telnet Port	23 📚	EtherNet/IP I/O Watchdog Timeout Action	
		Transition to Timed Out	
IPsec Enable IPsec	Settings	Auto Delete	
		OK	Cancel

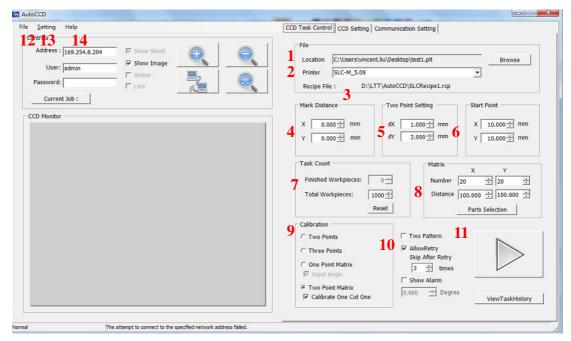
3.7.2 CCD Monitor

This area can show the image from CCD on time or last time. You can fine tune the job loaded in the CCD. For example, you can train a pattern here. (See 3.8 for more detail)

3.7.3 CCD Task Control

3.7.3.1 Function description

This area is the main settings to control CCD movement to fit the working piece marks in the working table.



- 1. File location: load the drawing file. (See <u>3.7.3.2</u> for more detail)
- 2. Printer: Select the working machine printer driver like SLC-D2.
- 3. Recipe File : The recipe which loaded by the prmissions [admin] of all setting include the parameters and drawing selection.
- Mark Distance: The distance between reference mark and working picture. (See <u>3.7.3.2</u> for more detail)
- Two Point Setting: The distance between two reference marks.(See <u>3.7.3.2</u> for more detail)
- 6. Start Point: The position to search the first reference mark. You can use functions of **[Position Test]** to find it.
- 7. Task Count: Count the work-piece and limit the total work-pieces. (The counter only count a successful job)
- 8. Matrix: For a matrix marks calibration, here are parameters for matrix marks settings.
- Calibration: Select calibration functions: Two Points, Three Points, One Point Matrix, Two Point Matrix.

10. Other Settings: Two Pattern : Select this potion if your work piece has two
deferent mark patterns.
Allow Retry : This function is only applicable under the matrix
calibrations. Select this function, if AUTOCCD
calibration is fail in anywhere, then the soft will let
the machine do the calibration by times you set
under the function, then upon the times, the
machine will let the piece bypass and continual the
work.
Degree : This function is only applicable under One Point Matrix
calibration. The calibration will fit the rotation
angle.
11. Start: Start the procedure of CCD function and working.

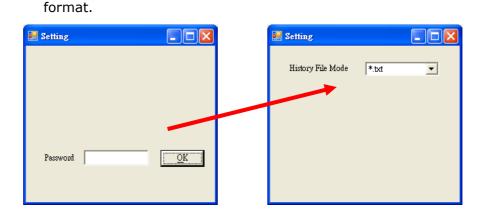
12. View Task History: It can show the task history in txt or excel format. Different format can be selected at [Setting].

13. File

Open Job: After connect with CCD, you can open a job saved in the CCD. Save Job As: For <admin> user, you can save job in the CCD. Load Recipe: Load work recipe for different application. Save Recipe As: Save work recipe as a *.rcp file.

				- ·	
<i>ί</i> η Αυ	toCCD				
File	Setting	Help	1		
	Open Job				
	Save Job A	ls	2.115	l R	Z Show Sheet
	Load Recip	pe			
	Save Recip	pe As		- 1	Show Image
	<u>E</u> xit		<u> </u>	. Г	Online
		1		Г	Live
	Current 1	loh i	LTT Chal	- 1	000 isla

14.Setting: You can key in the password [Itt] to change the task history stored





477 About	
477 Laser T	cols & Technics Corp. Shaping Your Future!
_	AutoCCD v2.00 Copyright (c) 1987-2012 Laser Tools & Technics Corp.
for any reason you need additional teo Tel: 886-3-5727772 (MonFri., 8:30	ct. Our technical support group is glad to work with you in answering your questions. If hmical assistance, please use the ways as following:
Fax: 886-3-5728898 Email: service@lttcorp.com Web: http://www.lttcorp.com Address: No. 121, Lane 99, Pu-Ding F	Road, Hsin Chu City, Taiwan, R.O.C.
	OK

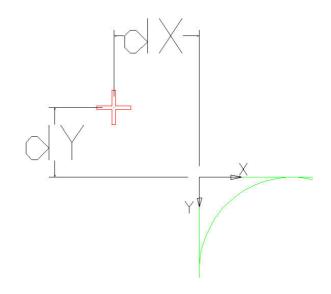
3.7.3.2 Setting Definition

File:

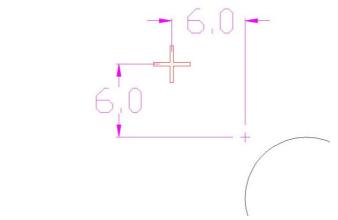
Drawing file is only contained drawing for cutting. Any other reference drawing will make wrong cutting position. Drawing file should be the format in plt or prn. When print, please select **[Print to file]** to save the prn or plt file in your computer. Please pay attention before printing, in the driver [Page] tab, the [Position Mode] must leave empty checks in [Temporary ref. Point] and [Stay Reference Point]

Mark Distance:

Mark Distance means the distance between reference mark and the top left of the drawing. If the top left of the drawing is a curve, the distance is showed below. The values of dX and dY are minus in below drawing.

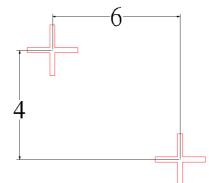


For example, the values of dX and dY in below drawing are -6 and -6



Tow Point Setting:

Two Point Setting is the distance between two reference marks. If the top left one is the origin of the coordinates, the coordinate of the bottom right one is the setting.



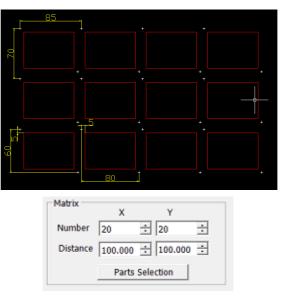
For example, two point setting of above picture is dX = 6, dY = 4

Matrix:

In the following example, each cell has two cross at top-left and down-right.

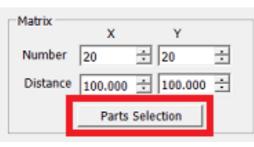
Number for x, y are 4, 3.

Distance for x, y are 85, 70.



Parts Selection:

Under this function, you can choose the pieces you want to do or bypss.



	the party of					C Table Control (1)	Calling Carettan	attan Satting		
				Part	s Selection	to Process				
	🗷 X1 . Y1	₩ X2. Y1	🗹 X3 . Y1	▼ X4 . Y1	🗹 X5 . Y1	☑ X6 . Y1	₩ X7.Y1	₽ X8.Y1	▼ X9. Y1	▼ X10.Y1
	🗹 X1 . Y2	₩ X2 . Y2	🗹 X3 . Y2	🗹 X4 . Y2	🗹 X5 . Y2	▼ X6 . Y2	🗹 X7 . Y2	🗹 X8 . Y2	💌 X9 . Y2	🔽 X10 . Y2
Ī	🗹 X1 . Y3	🗹 X2 . Y3	🗹 X3 . Y3	🗹 X4 . Y3	🗹 X5 . Y3	₩ X6.Y3	🗹 X7 . Y3	🗹 X8 . Y3	🔽 X9 . Y3	🔽 X10 . Y3
	🗹 X1 . Y4	☑ X2 . Y4	☑ X3.Y4	☑ X4 . Y4	🔽 X5 . Y4	☑ X6 . Y4	🔽 X7 . Y4	▼ X8 . Y4	💌 X9 . Y4	🔽 X10 . Y4
	🗹 X1 . Y5	🗹 X2 . Y5	🗹 X3 . Y5	🗹 X4 . Y5	🗹 X5 . Y5	🗹 X6 . Y5	🗹 X7 . Y5	🗹 X8 . Y5	🗹 X9 . Y5	🔽 X10, Y5
	🔽 X1. Y6	₩ X2.Y6	₩ X3.Y6	☑ X4 . Y6	🛛 X5 . Y6	▼ X6 . Y6	V X7.Y6	🔽 X8 . Y6	🔽 X9 . Y6	🔽 X10 . Y6
	🗷 X1 . Y7	🗹 X2 . Y7	🗹 X3, Y7	🗹 X4. Y7	🗹 X5 . Y7	🗹 X6 . Y7	🗹 X7. Y7	🗹 X8 . Y7	🗹 X9 . Y7	🗷 X10 . Y7
	🗹 X1. Y8	🗷 X2 . Y8	🗹 X3 . Y8	🗹 X4 . Y8	🗹 X5 . Y8	🗹 X6 . Y8	🗹 X7 . Y8	🗷 X8 . Y8	🗹 X9 . Y8	🗹 X10 . Y8
					Datata	A.U.		01		
		(Check All		Delete	AII		Close		

One Point Matrix:

Under this function, AUTOCCD will take only one point for calibration for every piece.

With its sub-function [Input Angel], then enter the angel in [Degree] to specifies the default rotation angle.

With its sub-function [Allow Retry] to retry calibration or bypass the fail piece.

Under the calibrate function, you will get the shorter working time.

Calibration	
C Two Points	Two Pattern
C Three Points	Skip After Retry
One Point Matrix Input Angle	3 ÷ times
	Show Alarm
C Two Point Matrix Calibrate One Cut One	0.000 🛨 Degree
Calibrate one cut one	

Two Points Matrix:

Under this function, AUTOCCD will take two points for calibration for every piece.

With its sub-function [Calibrate One Cut One], will let machine cut one piece after done one calibrate, till all pieces are done.

*To act in concert with the function, you have to select the [Stay Reference Point] in driver while output the drawing, the method of operation is as following picture.

With its sub-function [Allow Retry] to retry calibration or bypass the fail piece. Under the calibrate function, you will get the batter calibrate/cutting quality.



3.7.4 CCD Setting

Here are the functions for user to calibration, setup for CCD job, setup Start point.

Y 9.000 ± mm Password: Calibration 1 Pixel= 0.02050 ± mm OK Pixel to MM Pixel to MM Disable cest Current Position A coi: Current Position A
0:Current Position
000

- 1. CCD shift: The CCD shift is the distance between laser focus and the center of CCD camera. (See <u>3.7.4.1</u> for more detail)
- 2. Auto Calibration: Do auto calibration to update CCD shift values.

3. CCD Field Of View: It shows the field size of CCD View in mm. (See <u>3.7.4.1</u> for more detail)

- 4. Pixel to MM: Do auto calibration to update 1 Pixel to mm transform constant.
- 5. CCD and Control Setting: Before change the CCD IP address, user, CCD shift and CCD Field of View, you need to enter the password. When enter the password, you need to click [OK] to make it work. After change those settings, you can click [Disable] to prevent any other one from changing settings.
- Position Test: You can move the carriage by using this function. You can find the start position by using this function too. (See <u>3.7.4.2</u> for more detail)

3.7.4.1 CCD shift and CCD Field Of View

This section will show you how to do the auto calibration of CCD Shift and CCD Field Of View. It is very important for SLC-D2 cutting with CCD. It is a very basic setting for CCD. If the number of CCD Shift and CCD Field Of View are not right, you can not get a accuracy cutting with CCD.

Please do the [Pixel to MM] first and then [Auto Calibration]

1. Preparation steps for CCD calibration.

- Put a A4 paper at the center of the working area. Make sure the paper will not be moved during the whole calibration.
- Turn on the laser power key.
- Press the Connection button and let the AutoCCD connects with CCD.
- Please DO NOT select the [online] function to avoid the error while calibration.



- Go to AutoCCD / File / Open Job. Open [Calibration_Circle_200.job]
- Go to AutoCCD / CCD Setting tab. Key in the Password with [LTT].

2. Do the [Pixel to MM] calibration.

- Press [Pixel to MM] button.
- The AutoCCD will automatically send a P2MM.prn file to the machine and then marks two circle on the A4 paper.
- AutoCCD will automatically move the CCD to get the image, then calculate the pixel to millimeter transform constant.
- Finally you will see the number of [1 Pixel= mm] will be updated by AutoCCD.
- You can do it again. Please don't move the marked paper, and turn the laser power key off. Then press [Pixel to MM] button again. It will do the above processes all over again.

CCD Shift	CCD Field Of View	CCD and Control Setting
X 56.810 + mm	X 12.000 + mm	
Y -2.034 ÷ mm	Y 9.000 ÷ mm	assword:
Auto Calibration	1 Pixel= 0.02050 + mm	ОК
	Pixel to MM	Disable

7

3. Do the [Auto Calibration] calibration.

- Press [Auto calibration] button.
- The SLC-D2 will automatically send a Shift.prn file to the machine and then marks a circle on the A4 paper.
- AutoCCD will automatically move the CCD and get the image, then calculate the shift parameters constant.
- Finally you will see the number of [CCD Shift] will be updated by AutoCCD.
- You can do it again. Please don't move the marked paper, and turn the laser power key off. Then press [Auto calibration] button again. It will do the above processes all over again.

CCD Shift	CCD Field Of View	CCD and Control Setting
X 56.810 - mm	X 12.000 mm	Password:
Y -2.034 :mm	Y 9.000 mm 1 Pixel= 0.02050 mm	ОК
Auto Calibration	Pixel to MM	Disable

3.7.4.2 Position Test

This function is to use for finding star position and moving carriage.

1.Go To: Set up the position to move

- 2. Current Position: Show the present coordinate of the carriage.
- 3. Go To Position: Move the carriage to the position which is setting in #1
- 4. Go To Position 2: Move the carriage to the position 2 which calculates from #1 and two point setting.

5. Homing: Move the carriage to home and reset the position of home if the carriage loses its position.

6. Set as Start Point: After finding the start position, you can set the coordinate in #1 to be the start point by click this button.

6. Moving: You can moving the carriage toward four directions by the distance in the middle blank.

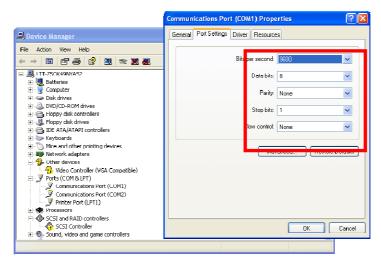
3.7.5 Communication Setting

Communication Setting is setup the communication port of RS232. Before change this setting, you need enter the password and click **[OK]** to allow changing. Please only change the port. If change other settings, the connection between PC and machine may not be made. The [Disable] button can disable other one without permission to change the setting.

CCI	D Task Control	CCD Setting	Co	mmunication Se	etting	
	System Settii Port	ng	1	Language Selec	tion : English	-
i	Baud Rate	9600 💌	bp	3		_
	Data Bits	8 🔻				
	Parity	None 💌		Password		
	Stop Bits	1 🔽			OK Disable	

Language Selection: User can change the language. Before change this setting, you need enter the password and click **[OK]** to allow changing.

Choose the COM port that connected PC and machine (the COM port should be identified correctly). Make sure that the parameters in computer's COM Port are the same as in AutoCCD.



3.7.6 Tips of AutoCCD

The AutoCCD has a hot key function. When all parameters are setting. When the tap is on **[CCD Task Control]**, you can press **[Enter]** to start the CCD task. When quantity production. You can connect a mini number keyboard. Setup parameters first. Then, you can just load/unload work-pieces and press **[Enter]**.

Other Hot Keys

Controls:

 \underline{C} onnect = $\overline{Alt} + C$ **CCD Task Control:** Browse = Alt + B Run = Enter **CCD Setting:** <u>**G</u>o To Position = Alt + G**</u> Go To Position $\underline{2} = Alt + 2$ Homing = Alt + H Set as Start Point = Alt + S $\underline{U}p = Alt + U$ $\underline{\mathbf{D}}$ own = $\mathbf{AIt} + \mathbf{D}$ Left = Alt + L $\underline{\mathbf{R}}$ ight = $\mathbf{AIt} + \mathbf{R}$ Ok = Alt + O**Communication Setting:** Ok = Alt + O

3.8 CCD Jobs Description

There are four types of jobs for user to use for SLC-D2 cutting with CCD. These jobs are special design for AutoCCD. Please note the version compatibility between jobs and AutoCCD.

Job	Function
LTT_Pattern-1-200.job	It works for single pattern. CCD will find the matched
	pattern in the field of view. It will output the defined
	position if the matched pattern is over the accept
	thresh.
LTT_Pattern-2-200.job	It works for both single pattern and two different
	patterns.
LTT_Circle-1-200.job	It works only for single circle pattern.
Calibration_Circle_200.job	It works for CCD calibration about FOV and CCD
	Shift.

3.8.1 Single Pattern Job

AutoCCD use CCD to find reference marks in the material and calculate the position difference and rotate angle. If these reference marks are the same, then you can use this job. It works for single pattern. CCD will find the matched pattern in the field of view. It will output the defined position if the matched pattern is over the accept thresh.

Job Name : LTT_Pattern-1-200.job

47 AutoCCD	
File Setting Help Controls	
Address : 192,168,2,115 User: operator Password:	✓ Show Sheet ✓ Show Image ✓ Online
Current Job : LTT_Patte	ern-1-200.job
CCD Monitor	
BModel Region ver J2.00 Center Offset_X 0 € Center Offset_Y 0 € Accept Thresh 50 € Score 0.00 Exposure (ms) 1.0 € Find region scale 99.5 €	

Name	Descriptions			
Model Region	Press this button; you can train the pattern that you			
	want.			
	You can save the job setting as a <admin> user. For</admin>			
	<operator> user, the job setting can not be saved.</operator>			
Ver. J2.00	This is the version of the job file.			

	You can fine tune the position of the trained pattern
Center	that you want CCD output. You can adjust it up and
Offset_Y	down.
	Tips:The green arrow aims the positive direction.
Center	You can fine tune the position of the trained pattern
Offset X	that you want CCD output. You can adjust it left and
Oliset_A	right.
Accept Threeh	The minimum limit for the CCD find the matched
Accept Thresh	pattern in the field of view.
Score	The score for the CCD find matched pattern.
	You can control the image acquire exposure time. The
Exposure (mc)	setting value is from 0.016 to 1000. When you use a
Exposure (ms)	lower exposure time, you have to input a higher LED
	light.
Find region	You can setup the find region area, the setting value
scale	from 10 to 99.5.

3.8.2 Two Pattern Job

AutoCCD use CCD to find two marks in the material and calculate the position difference and rotate angle. If these two marks are not the same, then you can use this job. It works for two different patterns. This job can also work for the single pattern.

Job Name : LTT_Pattern-2-200.job

¹ 77 AutoCCD	
File Setting Help Controls	C
Address : 192.168.2.115 User: operator Password:	Image Image Image Image Image Image Image Image
CCD Monitor	ern-2-200.job
Center Offset_Y 0 Center Offset_X 0 Center Offse	delReg_2 ter Offset_Y 0 = ter Offset_X 0 = ept Thresh_2 = 50.82
	1 Region Scale 99.5

Name		Descriptions
ModelReg_ 1	ModelReg_ 2	Press this button, you can train the pattern
		that you want.
		You can save the job setting as a <admin></admin>
		user. For <operator> user, the job setting can</operator>
		not be saved.

Center Offset_Y	Center Offset_Y	You can fine tune the position of the trained pattern that you want CCD output. You can adjust it up and down.			
Center Offset_X	Center Offset_X	You can fine tune the position of the trained pattern that you want CCD output. You can adjust it left and right.			
Accept Thresh_1	Accept Thresh_2	The minimum limit for the CCD find the matched pattern in the field of view.			
Score_1	Score_2	The score for the CCD find matched pattern.			
Exposure (ms)		You can control the image acquire exposure time. The setting value is from 0.016 to 1000. When you use a lower exposure time, you have to input a higher LED light.			
Find region scale		You can setup the find region area, the setting value from 10 to 99.5.			

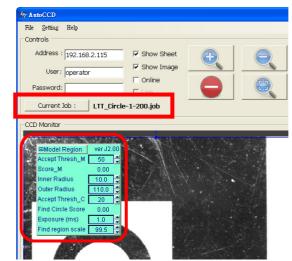
3.8.3 Circle Pattern Job

It works for single circle pattern. This job has two steps to find the circle center.

1st step, it finds the pattern that matched.

2nd step, it will find the circle in the matched pattern and output the center position. It will find the circle between inner radius and outer radius.

Job Name : LTT_Circle-1-200.job



Name	Descriptions			
	Press this button, you can train the circle pattern.			
Model Region	You can save the job setting as a <admin> user. For</admin>			
	<operator> user, the job setting can not be saved.</operator>			

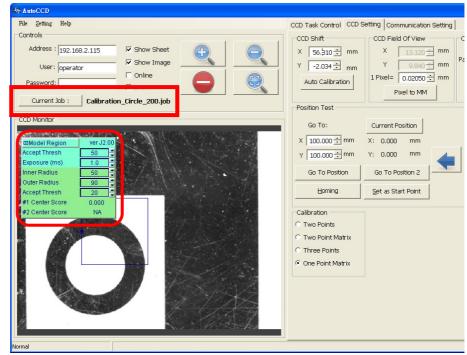
Accept Thresh_M	The minimum limit for the CCD find the matched			
Accept mesn_M	battern in the field of view.			
Score_M	The score for the CCD find matched pattern.			
Inner Radius	Inner radius setting.			
Outer Radius	Outer radius setting.			
	The minimum limit for the CCD find the matched			
Accept Thresh_C	circle between inner radius and outer radius. You can			
	adjust the level for different image.			
Find Circle Score	The score for the CCD find matched circle between			
	inner radius and outer radius.			
	You can control the image acquire exposure time.			
Exposure (ms)	The setting value is from 0.016 to 1000. When you			
Exposure (IIIs)	use a lower exposure time, you have to input a			
	higher LED light.			
Find region scale	You can setup the find region area, the setting value			
	from 10 to 99.5.			

3.8.4 Calibration Job

It only works for CCD calibration about FOV and Shift. When you want to calibrate the <Pixel to MM> and <Auto Calibration>, you have to load this job.

Run <Pixel to MM>, the AutoCCD will send a P2MM.prn file to machine. It will mark two circles at the center of the working area. AutoCCD will move the CCD to the position and find these two circle center and calculate the pixel to mm transform constant.

Run <Auto Calibration>, the AutoCCD will send a shift.prn file to machine. It will mark one circle at the center of the working area. AutoCCD will move the CCD to the position and find the circle center and calculate the CCD shift constants.



Job Name : Calibration_Circle_200.job

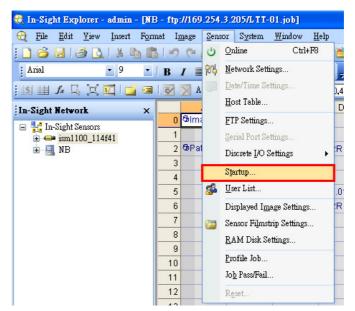
Name	Descriptions			
	Press this button, you can train the pattern that you			
Madal Dagian	want.			
Model Region	For the first time use this function, you have to train it			
	and save.			
	The minimum limit for the CCD find the matched			
Accept Thresh	pattern in the field of view.			
	You can control the image acquire exposure time. The			
	setting value is from 0.016 to 1000. When you use a			
Exposure (ms)	lower exposure time, you have to input a higher LED			
	light.			
Inner Radius	Inner radius setting.			

Outer Radius	Outer radius setting.
	The minimum limit for the CCD find the matched circle
Accept Thresh	between inner radius and outer radius. You can adjust
	the level for different image.
#1 Center	The score for the CCD find matched circle between
Score	inner radius and outer radius.
#2 Center	The score for the CCD find matched circle between
Score	inner radius and outer radius.

3.8.5 Set the Default Job

When AutoCCD connects to the CCD, it will use the present job in In-sight explorer. If In-Sight Explorer does not be executed, AutoCCD will load the default job. This section will explain how to setup a job to be the default job.

- 1. Connect to the CCD.
- Please make sure the job you want to set as a default job is in the CCD device. You can check it from the [In-Sight Files]. You can see display or hide it by pressing
 Shift + Ctrl + 2.
- 3. Click [Sensor] -> [Startup...]



4. Select the job you want to be set as the default job. Then, press **[OK]**. The setting will take effect after CCD restarted.

ism1100_11	14f41 - Startup	
Dnline Job:	LTT-01.job	
-	ОК	Cancel

3.8.6 Job Copy, Save and Delete

If you need to do job copy, save and delete, you must use <admin> connect with CCD. For a <operator> user, it can not be done about save and delete actions.

Copy Job from PC to CCD

1.Copy the job at PC.

2.Go to File / Open Job. Right click the mouse, choose Paste.

477 AutoCCD	😪 PC-201 - Open		X
File Setting Help Controls	Look in: An An	PC-201 10602_LTT-01Test_Moses.job 10602_LTT-circle Test_Moses.job Calibration_100Test_Moses.job Calibration_Circle_200.job LTT_circle-1-200.job LTT_Pattern-1-200.job LTT_Pattern-2-200.job	View
Exposure (ms) 1.0 Find region scale 99.5		File name: Files of type: Job files (*.job)	Cancel

Copy, Delete, Rename a Job from CCD

1. Go to File / Open Job. Select a job and right click the mouse, choose Copy, Delete or Rename.

2. Right click mouse at PC's folder, and choose Paste then you can copy the job to PC.

47 AutoCCD File Setting Help Controls Address : 192.168.2.115 User : operator Password:	PC-201 - Open Look in: 桌面 My Documents	PC-201 10602_LTT-01Test_M 10602_LTT-circleTest Calibration_100Test_1 Calibration_Circle_20 LTT_circle-1-200.job	_Moses.job 400000 j D.job Delete D		
Current Job : LTT_C CCD Monitor EModel Region ver J2 Accept Thresh_M 50 Score_M 0.00 Inner Radius 10.0 Outer Radius 110.0 Accept Thresh_C 20	用 Documents 我的電腦 ぞう 網路上的芳鄭 In-Sight Sensors	LTT_Pattern-1-200.jol		2	
Find Circle Score 0.00 Exposure (ms) 1.0 Find region scale 99.5		File <u>n</u> ame: Files of type: Job f	illes (*.job)	•	Open Cancel



Save Job

- 1. Go to File / Save Job As, it will open a Save As Window.
- 2. You can choose a job to overwite or give a new file name to save.



Chapter 4 Maintenance

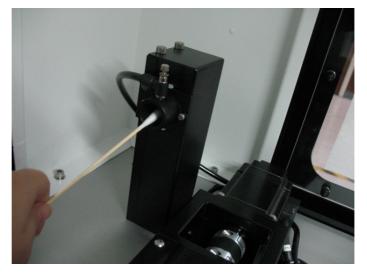
4.1 Daily Cleaning



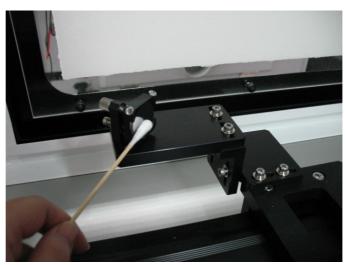
- 1. Preparation
 - Ensure that the system is turned off and the AC power cable is unplugged.
 - Prepare for cotton swab, cotton cloth, and alcohol.

2. Clean machine

- Remove all loose dirt and debris from inside of the machine.
- Clean the top window with cotton cloth and alcohol.
- Clean all of the rails of the motion system with cotton cloth and alcohol.
- 3. Clean lens and mirror
 - Clean the window lens with cotton swab and alcohol.

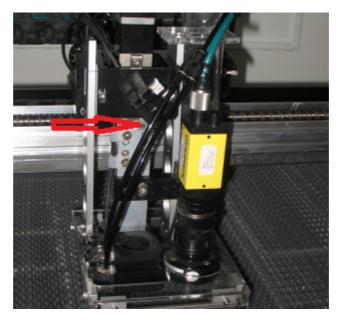


• Clean 4th mirror with cotton swab and alcohol.

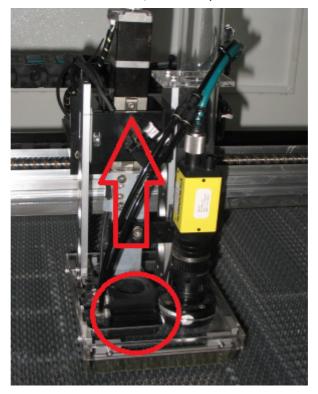


• Clean 5th mirror and focal lens with cotton swab and alcohol.

Clean **5th** mirror with cotton swab and alcohol



Lift the Z-axis to take out the lens, assembly it back after clean the lens.



4.2 Weekly Cleaning



- 1. Preparation
 - Ensure that the system is turned off and the AC power cable is unplugged.
 - Prepare for compressive air which is waterless and oil free, dry brush, cotton swab and alcohol.

2. Clean machine

- Clean all electric components with compressive air and dry brush.
- Clean exhaust port with brush.
- Clean all cooling fans with compressive air.
- Clean all filter cottons.

3. Clean lens and mirror

• Clean 3rd mirror with cotton swab and alcohol.

Remove the left alignment cover.





Remove the reflection mirror protection cover.

Clean the mirrors.



assembly back after clean.

Chapter 5 Trouble Shooting

This chapter provides suggestions to check and solve some common problem. If you can't find any answer in this chapter, please see introduction to call technical support!!

Problem	Cause	Remedy and reference		
Power is not turned	AC power cable is not connected	Check Hardware Installation.		
on.	properly.	(See section <u>2.4</u> .)		
	Emergency stop is pressed	Turn right the pushbutton.		
	down.	(See section 2.3.)		
Laser beam is not	Laser on/off switch may be	Turn on the switch.		
emitted.	turned off.	(See section <u>2.3</u> .)		
	Doors with interlocks are not	Close all doors with interlocks.		
	closed. (If "Door" indicator is	(See section <u>2.3</u> .)		
	dark.)			
	The temperature of laser	Stop job for a certain time to		
	generator is too high.	cool laser generator.		
	Laser beam is misalignment.	Realign by adjusting mirrors.		
	The setting of laser power is too	Increase the setting.		
	low.	(See section <u>3.4.2</u> .)		
	Laser generator has	Please contact LTT.		
	breakdown.	(See Introduction)		
Cutting or engraving	Focal length is not suitable.	Adjust focal length.		
quality is bad.		(See section <u>3.3.1</u>)		
	Lens and mirrors are dirty.	Clean the lens and mirrors.		
		(See section <u>4.1</u> and <u>4.2</u>)		
	Setting of focal length on panel	Modify the setting.		
	does not match with lens.	(See section <u>3.3.2</u>)		
	Lens and mirrors are broken.	Please contact LTT.		
		(See Introduction)		
	The settings of laser power are	Modify the setting.		
	not suitable.	(See section <u>3.4</u>)		

Appendices

Appendix 1 Specifications

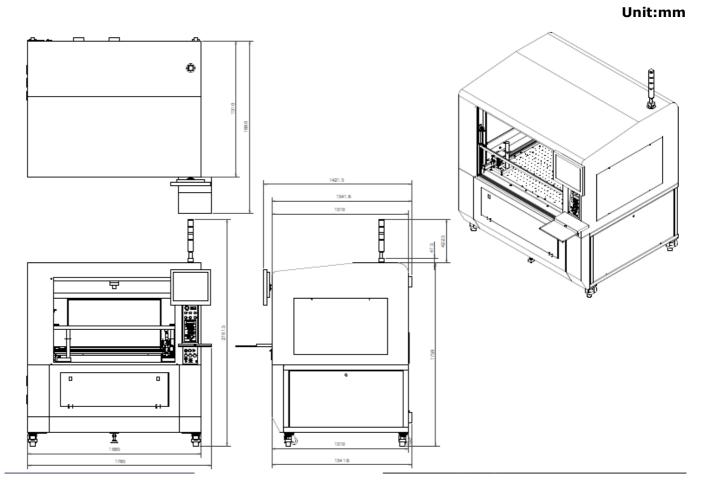
This section describes the specification of the SLC-D2 series.

Model	SLC-D2				
Work area	1000 (L) × 730 (W) mm				
Focal lens	50 (H) mm				
Movement					
Max. speed	300 mm/sec (11.8"/sec)				
Resolution(DPI)	1000, 500, 333, 250, 200, 160				
Memory Buffer	64MB				
Interface	USB port				
Laser generator	30W /60W /100W				
	(air-cooled CO2 laser)				
Power supply	220~240V AC, 15 Amp, 50/60 Hz				
Exhaust	requiring at least 6.0 m ³ /min air flow for two 4" connection				
Regulatory	RoHS directive				
Compliance					
Standard	Auto Focusing				
	Red-beam Pointer				
	Beam Expender				
	Honeycomb cutting table				
Options	Blower				
	Air compressor				

Appendices Appendix 2 Dimensions

This section describes the dimensions of SLC-D2 series.

SLC-D2 series



Appendices Appendix 3 Suggested Power and Speed Settings

The below settings are only intended to be starting points. Many variables can affect actual settings. Different manufacturers have different formulations, laser tubes differ in actual power output, natural materials vary greatly, and the user desired results will drastically affect actual settings.

Laser Source : 30 Watt									
Material	Туре	Thickness	Speed	Power	PPI	DPI			
Acrylic	Engraving		100%	20%		500/1000			
	Cutting	3 mm	3%	100%	1000				
		5 mm	2%	100%	1000				
		10 mm	0.5%	100%	1000				
Anodized Aluminum	Engraving		100%	40%		500/1000			
Card Stock	Cutting		40%	100%	250				
Cermark	Engraving		25%	100%		500			
Ceramic Tile	Engraving		60%	100%		500			
Coated Brass	Engraving		100%	50%		1000			
Crystal	Engraving		100%	30%		500			
Denim	Engraving		100%	30%		500			
	Cutting		20%	100%	500				
Glass	Engraving		100%	50%		500			
Granite	Engraving		60%	40%		333			
Laser Foil	Cutting		50%	100%		1000			
Laserable Plastic	Engraving		100%	20%		1000			
	Cutting	1.5 mm	8%	100%	500				
Leather	Engraving		100%	70%		500			
	Cutting		2%	100%					
Marble	Engraving		60%	23%		333			
Rubber Stamp	Engraving		15%	100%		1000			
	Cutting		4%	100%	500				
Wood	Engraving		100%	100%		500/1000			
	Cutting	3 mm	7%	100%	500				
		6 mm	2.5%	100%	500				