

## Preface

- This operating instruction is included with machine. Please keep this manual for reference at any time.
- Please read this manual carefully before operating this equipment.
- Due to the technical update and the special requirements of the product, the product may be partially different from the manual description, please in kind prevail, we will add additional instructions as much as possible.
- When the equipment is in normal use, please keep a certain space in front and behind the equipment, as necessary space for operation and maintenance. In addition, please do not obstruct the setting of the heat emission space for this equipment.
- Equipment operating environment: temperature: 5 ~ 25 °C, relative humidity: 20% ~ 95%, free from direct sunlight, no dew, no splashing water, no oil, no chemical liquid.
- The machine's technician who operates and maintains it must have computer operation skills.
- The computer configured on this machine can only be used for this machine, it is strictly forbidden to carry other movable storage device which can bring virus into the machine, so as to protect the control system.
- The U disk is properly configured to prevent the invasion of virus, and it is strictly prohibited to be used on other computers.
- For personal safety, when the equipment is running or standby, please do not open the front door or chains or the station head cover without taking safety measures, clothing and limbs must not get near the mechanical parts, otherwise, may incur body injury accidents.
- Repeated switching power supply on and off can be one of the reasons for equipment failure. After the power is turned off, please wait for at least 20 seconds before you turn on the power again.
- Do not expose the device to shock or strong vibration, otherwise it may cause malfunction.
- When cutting off the power, proceed the system exit / shutdown process in the following order. If you cut off the power supply or restarted it without following

this process, the data can not be saved completely and the hard disk can be damaged. Exit / Shutdown Procedure: Exit the application → exit Windows → disconnect the device from power.

- If the equipment is suspended, store the equipment in the proper environment: ambient temperature (0-40) °C, relative humidity (20 ~ 95)%, free from direct sunlight, no dew condensation, no splashing water, no oil and chemical liquid. Protective measures(such as covering cloth) can be taken to prevent dust and moisture.
- Please contact us in case of any questions, please do not operate blindly.

**Note: Please note above mentioned matters!**

## Machine overview:

S-400 laser marking machine for high-speed, high-precision, high-performance equipment, is specifically developed for PCB Barcode marking . Its laser head marking on PCB by moving the X, Y units with high precision in the PCB board area. The series of control software and operating software is developed by our company independently, all operations are controlled by a computer.

This laser marking machine has following major advantages:

- △ Full computer control, English version operating system, based on the Windows platform, easy to operate, fast, simple, easy to learn.
- △ Machine vision technology applied, online automatic programming, automatic correction, automatic identification of the MARK point, highly automotive.
- △ AC servo system provide stable line operation, excluding the instability caused by line failure, to achieve a stable high-speed, energy saving.

## Safety check before operation.

Please be aware: the machine for the new installation or long-term idle state, before supply the machine with power and compressed air and operation, we must do following security checks carefully:

- 1) Check whether the power supply is the specified rated voltage.
- 2) Check whether the main power supply is connected to the machine, and the fuse is intact, branch circuit breaker is closed.
- 3) Whether the equipment is properly grounded.
- 4) Ensure no unrelated objects remain in the electronic control box and the machine movable parts.
- 5) Check if conveyor belt and synchronous belt fall off during transportation.
- 6) Check if the lead screw, slide track, insertion shaft and other heavy-duty, high-speed operational units are properly connected.
- 7) Turn X, Y, units to see if they can move smoothly.
- 8) Check the limit detector and limitation are dislocated or not.
- 9) Check whether the emergency switch is pressed down, check the overall gas source, the power switch is at the OFF state.
- 10) Check wiring plug and air pipes between the computer, electric control box, the main and auxiliary parts are properly connected.

**Operation interface description, divided into the following areas:**

## **IST-DB100**

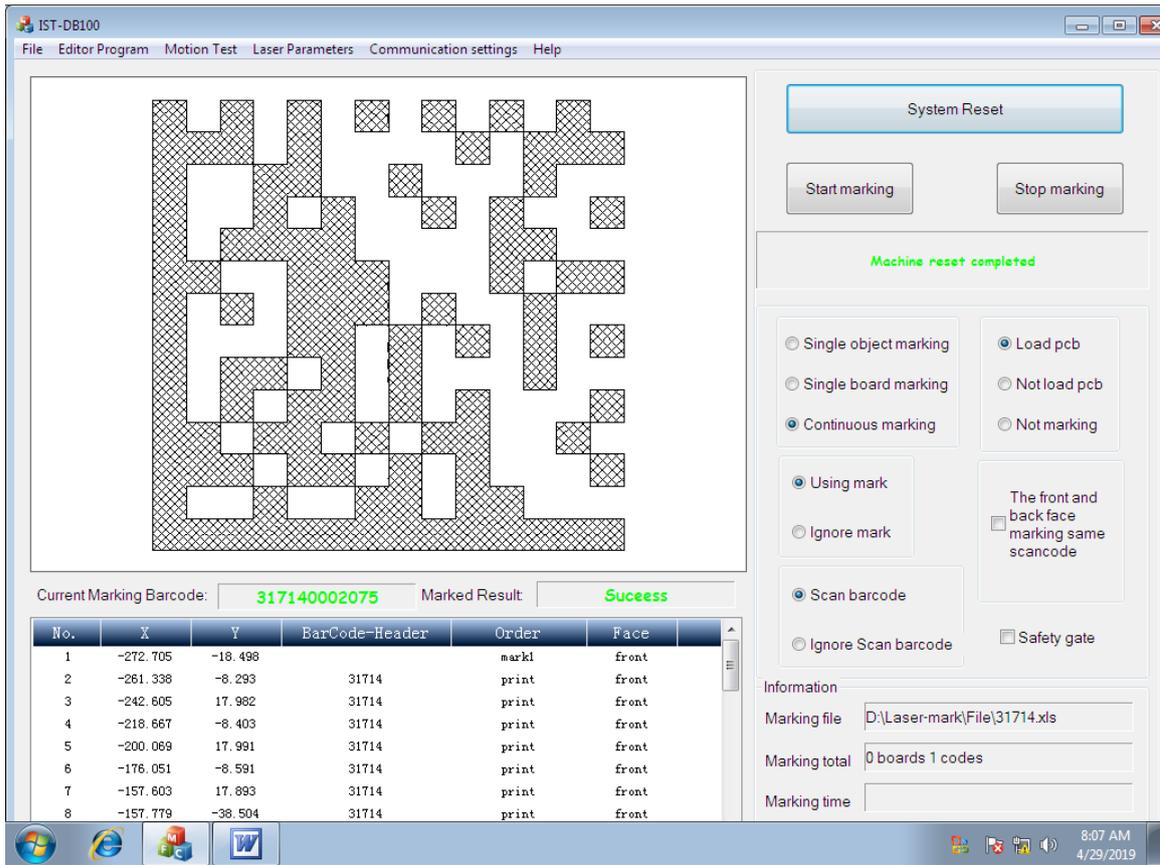


Fig. 1

1) Production operation area: This area is for the operation of the machine and the control of production(as shown above):

Button and selection explanation:

**Systems Reset:** reset all unit on machine to home position .

**Start marking:** run machine to marking barcode after read program.

**Stop marking:** machine stop

**Single object marking:** machine run and marking only one next barcode.

**Single board marking:** machine run and marking only one PCB.

**Continuous marking:** machine run with current setting quantity.

**Load PCB:** machine run with loading PCB from conveyor.

**Not load PCB:** machine run with current PCB and stop once finish.

**Not marking:** machine run without laser working.

**Using mark:** use barcode from EZcad

**Ignore mark:** skip barcode from EZcad

**Scan barcode:** camera read&check barcode after machine marking.

**Ignore scan barcode:** machine only marking barcode without camera read&check.

**The front and back face marking same scancode:** double side marking

**Safety gate:** to on/off the gate alarm

**Marking file:** to show the path of program

**Marking total:** to show the current production quantity

**Marking time:** to show the current production duration

**Current Marking Barcode:** to show the current barcode from server

**Marked Result:** to show the scan result by camera check

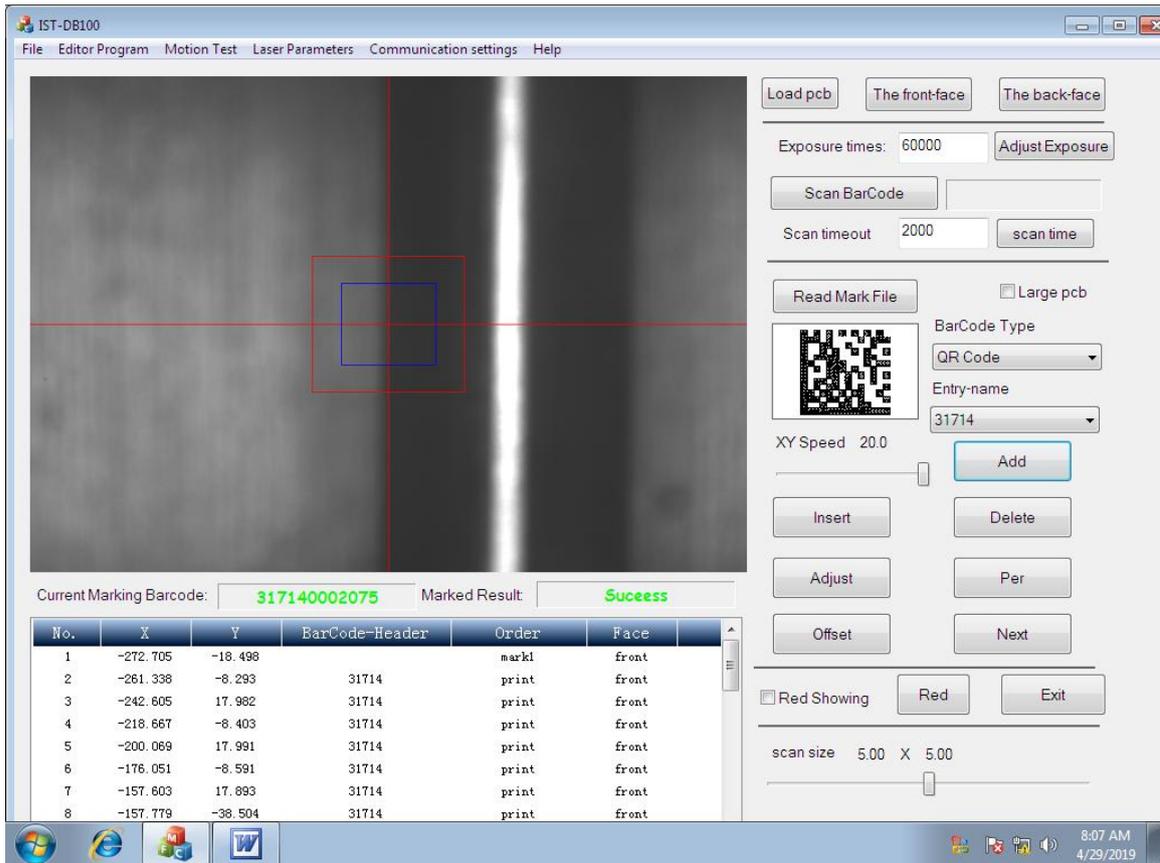


Fig 2

**Load PCB:** to load a PCB from conveyor

**The front-face :** to move table in 0 degree

**The back-face:** to move table in 180 degree

**Exposure times:** to adjust lightness of imaging from camera

**Scan timeout:** to adjust the scan duration of result checking

**Read mark file:** to read the barcode template from EZcad

**Large PCB:** in this mode machine will only receive PCB in table , PCB will never stop in L&R conveyor

**BarCode type:** choose the type of Barcode from EZcad

**Entry-name :** the name of EZcad file

**XY speed:** to adjust the speed of table while programming

**Add:** to add the barcode marking position in current camera area

**Insert:** to insert a new command line

**Delete:** to delete current selected line

**Adjust:** to adjust the position of current marking area

**Per:** move to previous mark position

**Next:** move to next mark position

**Offset:** to move all mark position as current mark position adjust

**Red showing & Red:** to let laser head give out a red light for positioning

**Scan size:** to set up the result checking area in MM while machine is running

**Exit:** Exit current page

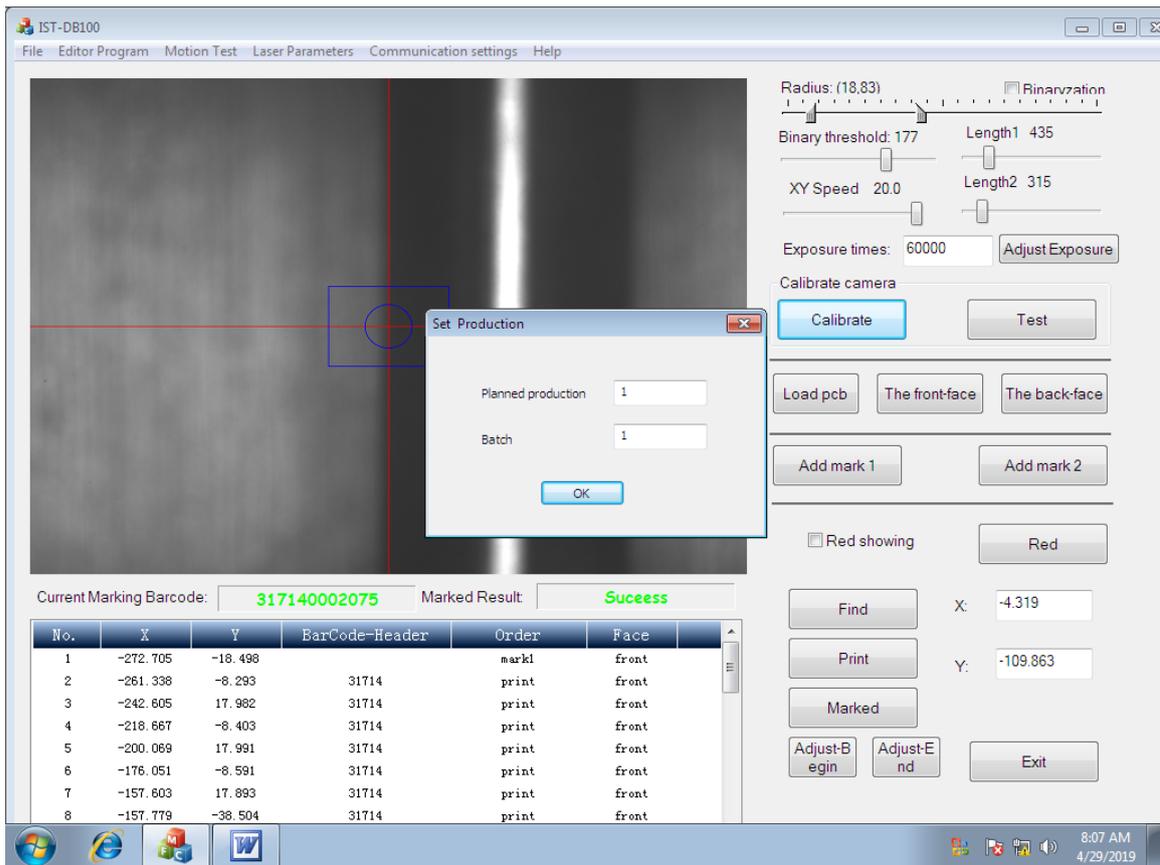


Fig 3

**Radius:** to choose the range of mark point size

**Binary threshold:** to adjust the lightness of current imaging

**Length1 & Length 2:** to set up the search range of mark point

**Calibrate camera & Calibrate & test:** useless , manufacturer only

**Load PCB:** to load a PCB from conveyor

**The front-face :** to move table in 0 degree

**The back-face:** to move table in 180 degree

**Add mark 1 :** Add the first mark point on current camera area

**Add mark 2:** Add the last mark point on current camera area

**Red showing & Red:** to let laser head give out a red light for positioning

**Fine&Print&Marked:** useless , manufacturer only

**X:** to adjust the relative position in X of camera , by MM

**Y:** to adjust the relative position in Y of camera , by MM

**Adjust-Begin:** to positioning current mark position by camera

**Adjust-End:** to positioning new position you want of mark by camera

**Planned production:** to set up the PCB quantity you want

**Batch:** set up the batch number(as in sever)

**Exit:** to exit current page

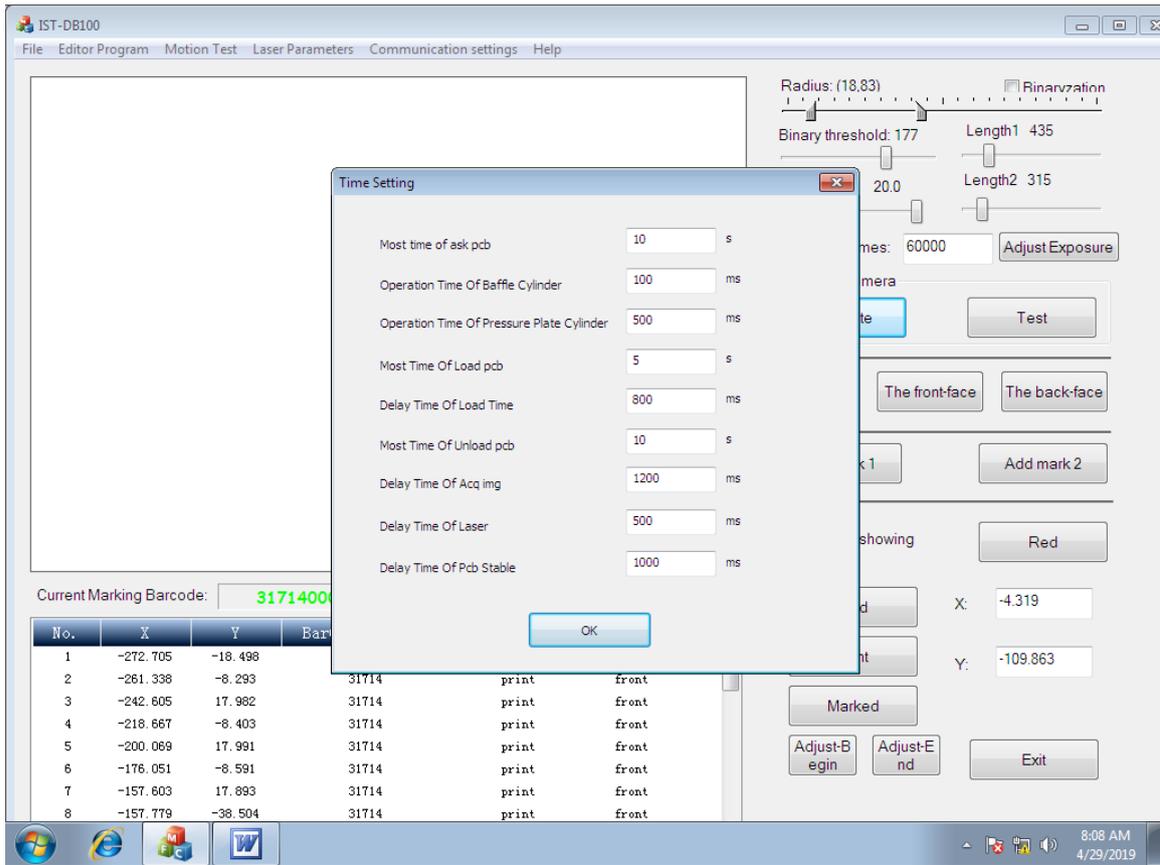


Fig 4

**Most time of ask PCB:** to set up the MAX time of machine asking PCB from upstream

**Operation time of baffle cylinder:** to set up the delay of baffle cylinder after PCB was detected in table

**Operation time of pressure plate cylinder:** to set up the delay of pressure plate cylinder after baffle cylinder complete move

**Most time of load PCB:** to set up the MAX time of machine loading PCB from conveyor

**Delay time of load time:** to set up the delay of loading PCB after current PCB was move out to next position

**Most time of unload PCB:** to set up the MAX time of machine unloading PCB

**Delay time of Acq**: to set up the delay of computer build a photo when NG result happen

**Delay time of Laser**: to set up the delay of laser marking after head was move in position

**Delay time of PCB stable**: to set up the delay of machine start to run after PCB was detected in table

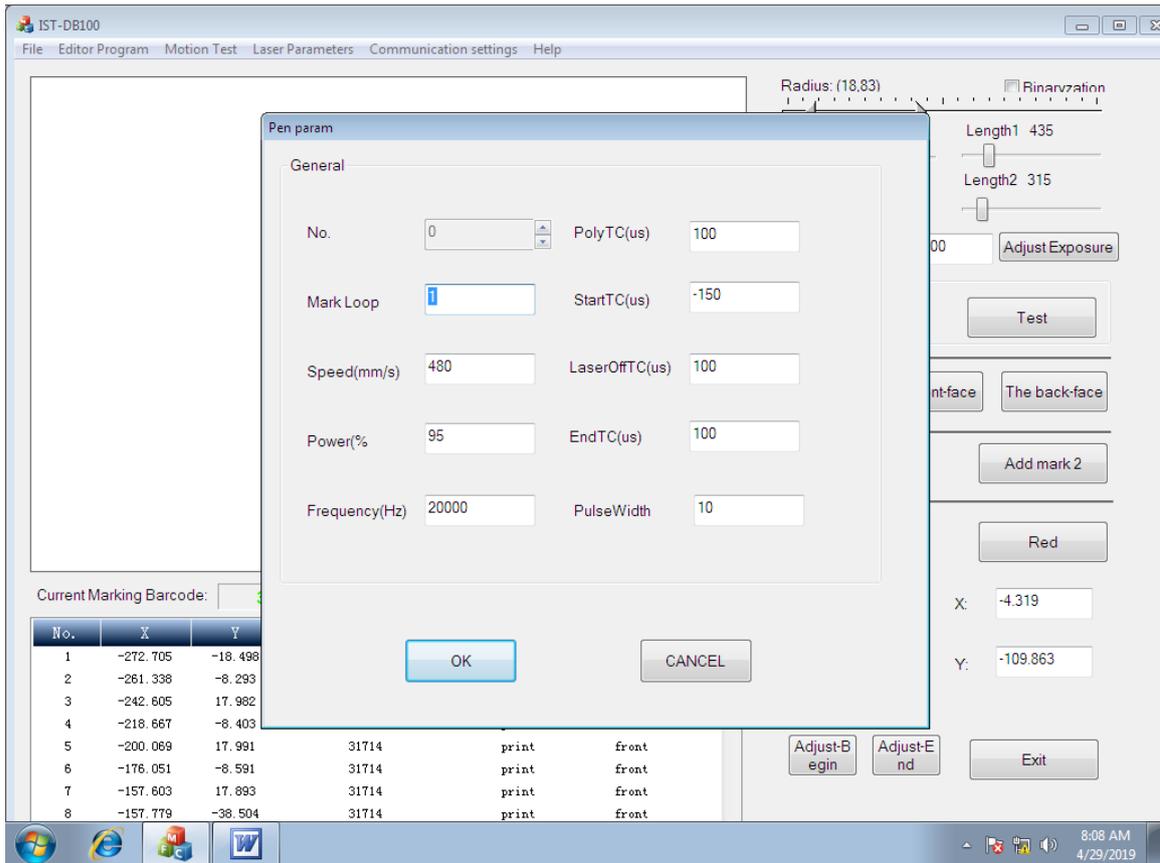


Fig 5

**Mark loop**: to set up the number of times for marking in one position

**Speed(mm/s)** : to set up the speed of laser running

**Power** : to set up the rate of laser power in %

**The rest** : **manufacturer only, do not change**

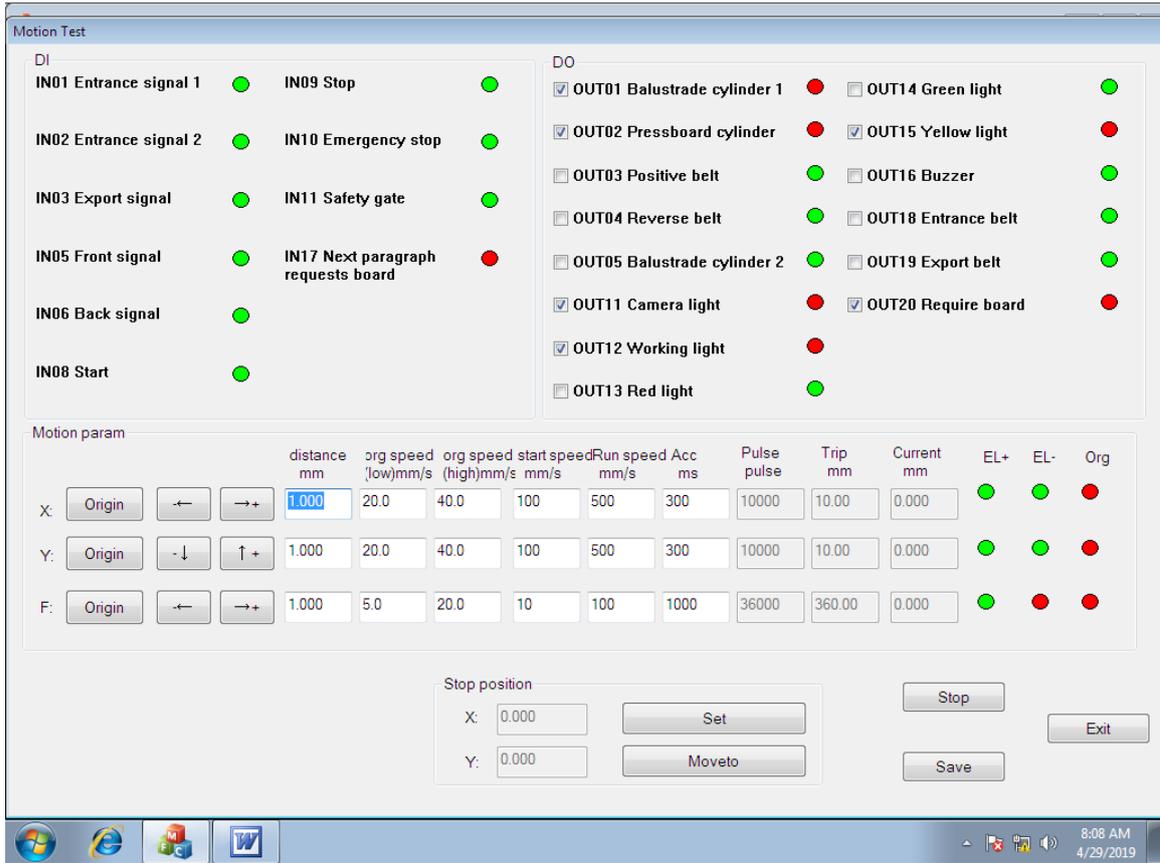


Fig 6

Motion Test : this page is for monitor machine status , including : buttons, sensors , motors, cylinders , lights

IN01: L conveyor PCB in coming

IN02: L conveyor PCB in position

IN03: R conveyor PCB in position

IN05: table 0 degree PCB in position

IN06:table 180 degree PCB in position

IN08: start button detect

IN09:stop button detect

IN10: Emergency stop button detect

IN11:safety gate detect

IN17: signal detect from downstream

OUT01: cylinder control for PCB stop in position

OUT02: cylinder control for PCB clamp

OUT03: table belt control while in 0 degree

OUT04: table belt control while in 180 degree

OUT05: cylinder control for PCB clamp

OUT11: camera light control

OUT12: machine lamp control

OUT13: tri-colour light control in red

OUT14: tri-colour light control in green

OUT15: tri-colour light control in yellow

OUT16: buzzer control

OUT18: L conveyor belt control

OUT19:R conveyor belt control

OUT20: machine send require PCB signal to upstream

Motion Param:

This page is for adjust motor speed and homeing

X: machine X position motor

Y: machine Y position motor

F: machine table rotate motor

Origin: motor run in zero position

**Distance mm:** set up the distance that motor runs

**Org speed(low):** set up the speed of machine homeing in first cycle,  
**manufacturer only, do not change**

**Org speed(high):** set up the speed of machine homeing in last cycle,  
**manufacturer only, do not change**

**Start speed :** set up the speed of motor starting

**Run speed:** set up the speed of motor runs after starting

**ACC:** set up the delay of motor speed up, **manufacturer only, do not change**

**EL+ :** motor limit+ position detect

**EL- :** motor limit- position detect

**Org:** motor home position detect

**Stop position (X,Y) :** **manufacturer only**

**Stop:** stop all running parts

**Save:** save new setting

**Exit:** to exit current page

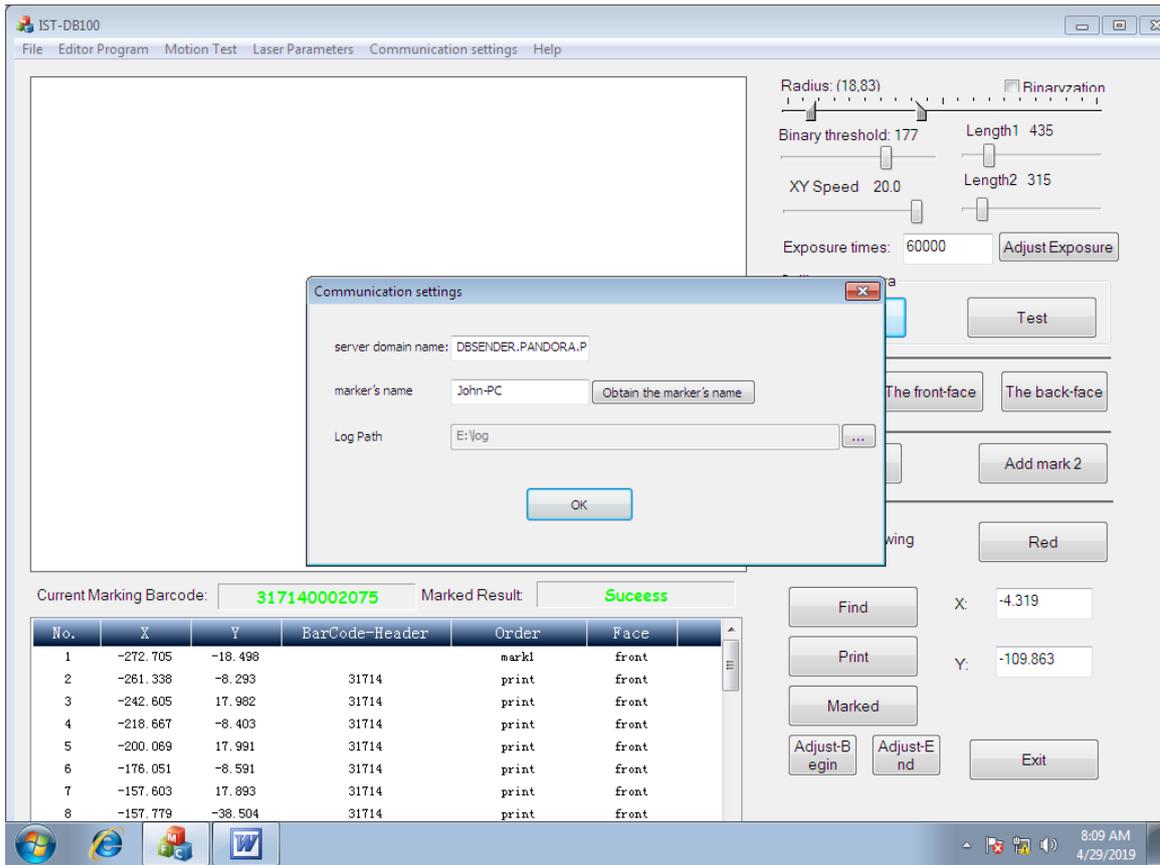


Fig 7

**Server domain name:** to set up the name of server and establish a connection

**Marker's name :** to set up the machine computer name

**Log path :** to bulid the path of NG mark photo saving.

# EZcad2

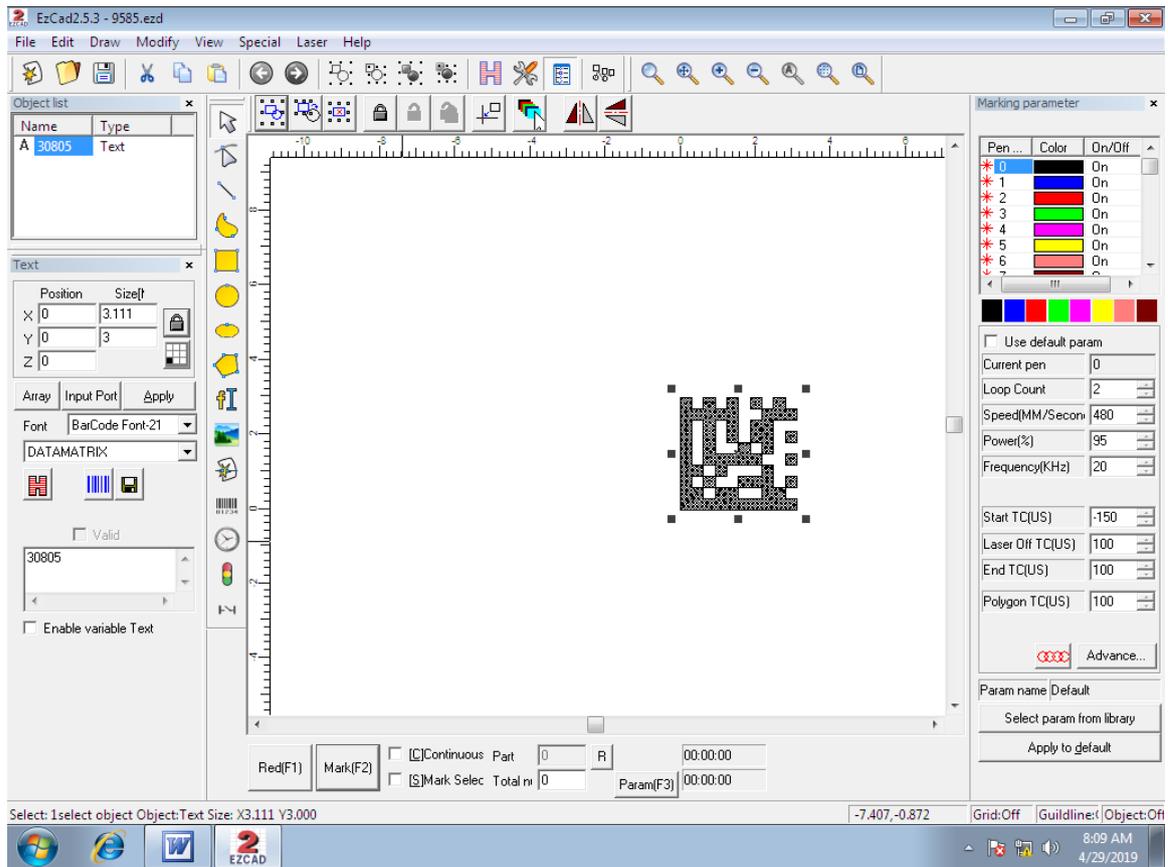


Fig 1

This software is for build a new template of barcode for **IST-DB100** reading and marking

Step1: Choose new file and name it

Step2: choose barcode font you want (in picture shows BarCode Font-21)

Step3: choose barcode format(in picture shows DATAMATRIX)

Step4: fill content(in picture shows 30805)

Step5: fill barcode size in X and Y (in picture 3.111 / 3)

Step6: set position X/Y/Z in 0

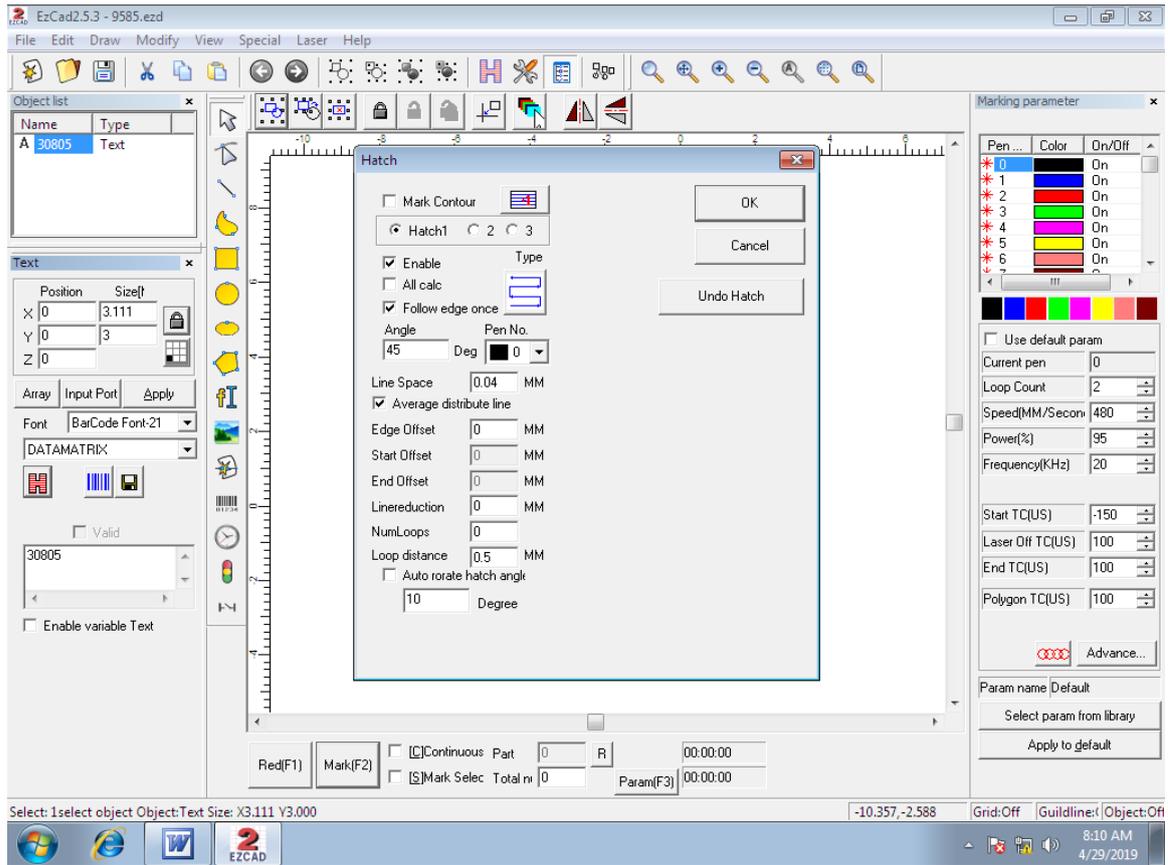


Fig 2

Step7: open Hatch , setting hatch 1& 2 as picture

Step8: check barcode and save file

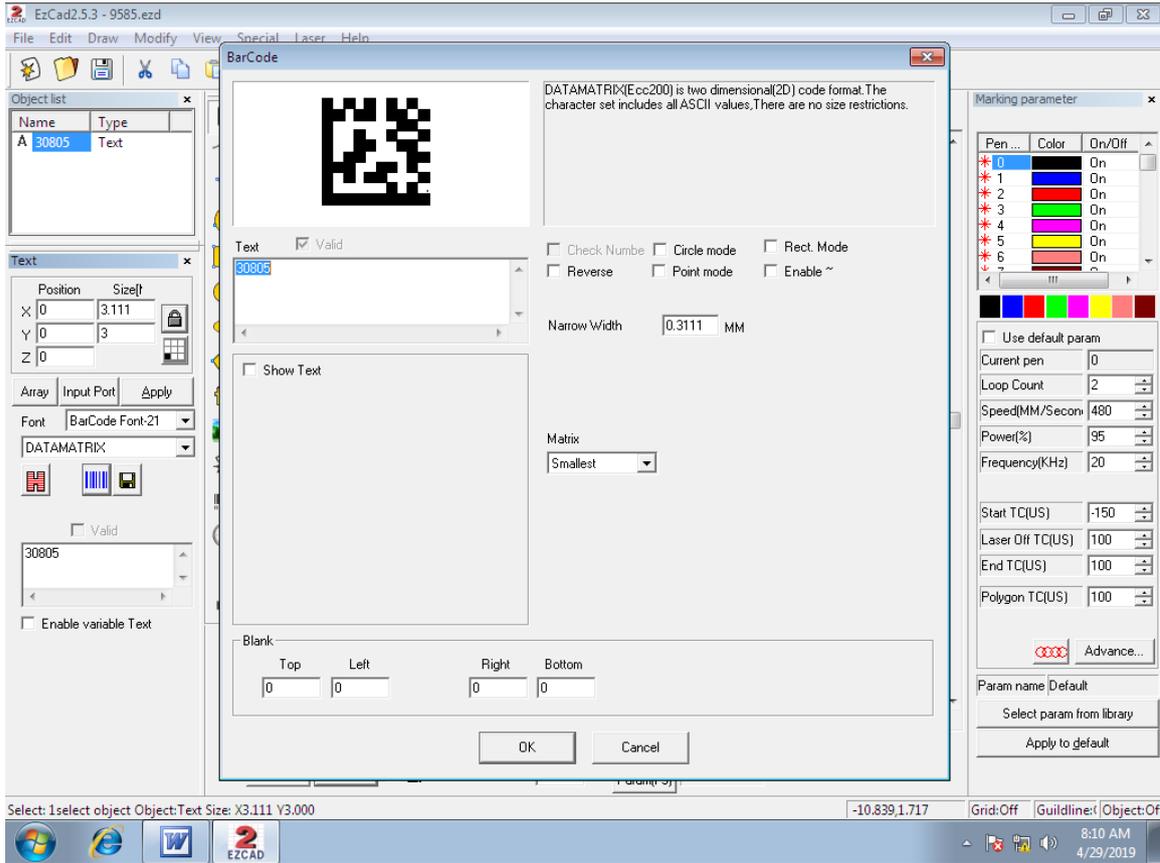


Fig 3

This page is for reverse barcode black and white color(if needs), choose “reverse” as picture shows.

After choose reverse function , barcode must add edge for normal display , in Blank area choose ”top” & “Left” & “Right” & “Bottom” ,and change the value from 0 to 0.5 (as picture shows).

The rest function and other page are **manufacturer only**