



Fly Mark Manual



BEIJING JCZ TECHNOLOGY CO LTD

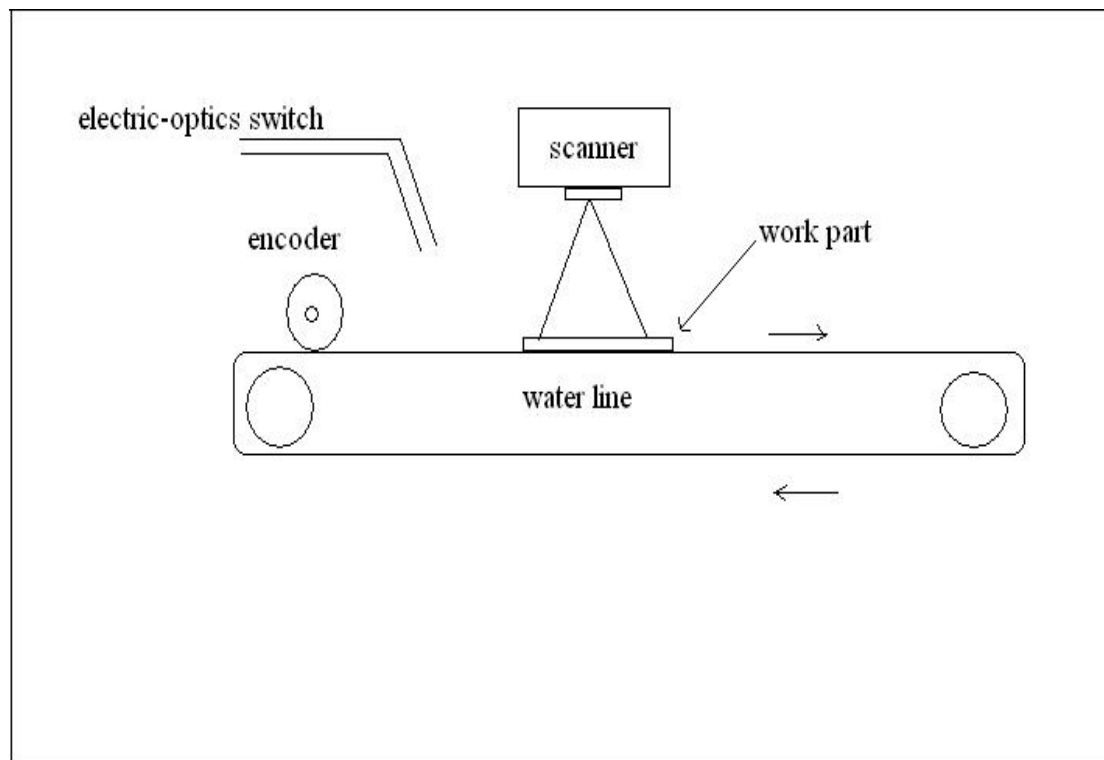
Overview

On-fly marking, in the contrast with static marking, is a marking method in which the scan head cooperate with a pipeline and the marking content adjust itself by hardware computing. The object needs marking can be continuous or scattered.

There are 2 working modes provided by this card: Mark on fly and Enable simulation.

Hardware on-fly is such a method that the speed of pipeline is traced and reported by a encoder and the encoder sends signal to the card. Using those signals the card can calculate the speed of the pipeline and control the scan head and laser to act correspondingly in a real time fashion.

Enable simulation is to pretend that the speed of the pipeline is a constant while there is no encoder involved at all. In this case a encoder is simulated so the motion of scan head have something to based on. This method can be used only when the pipeline is moving in a constant speed.



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Basic configuration

1. Hard ware

JCZ USB standard card (Open the **fly mark** function)

Differential Encoder (A+ A- B+ B- Z+ Z- 0V 5V)

Photoelectric Switch (NPN or PNP)

2. Software

Ezcad 2.12.0 or higher version

3. OS

Windows XP Professional /Corporate /Ultimate 32bit

Windows 7 Professional /Corporate /Ultimate 32/64bit

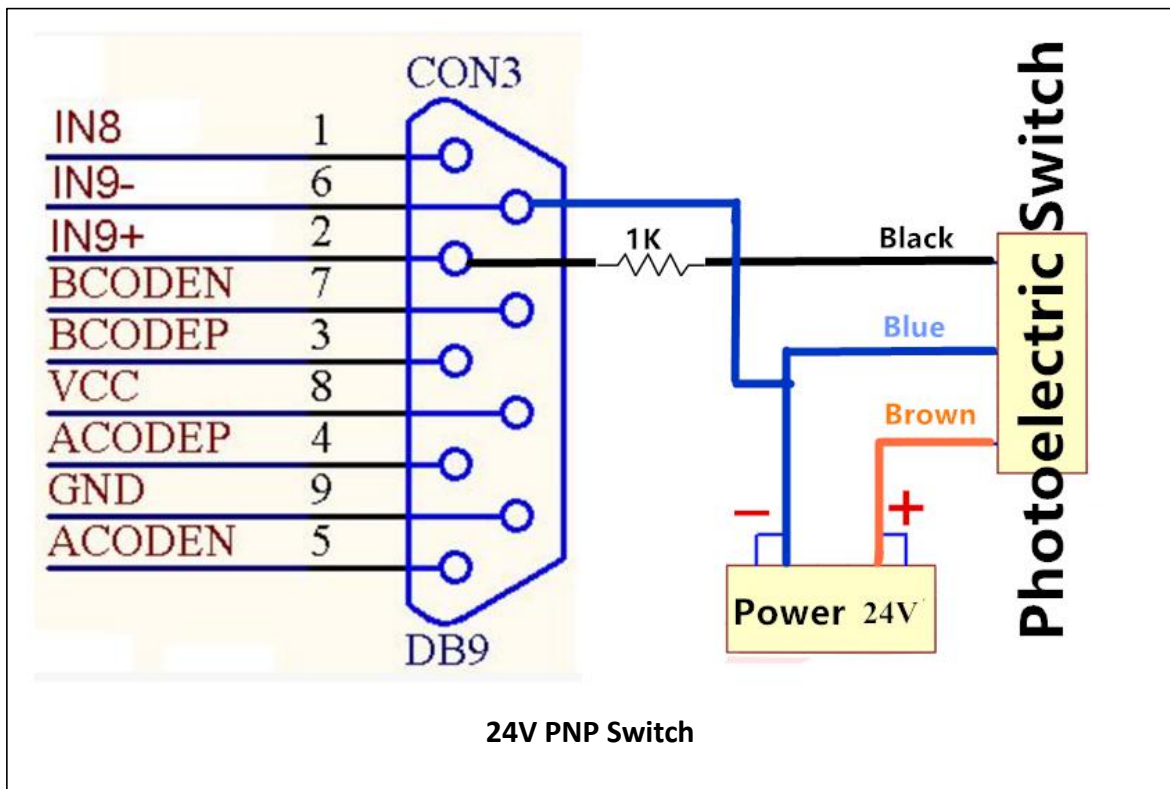
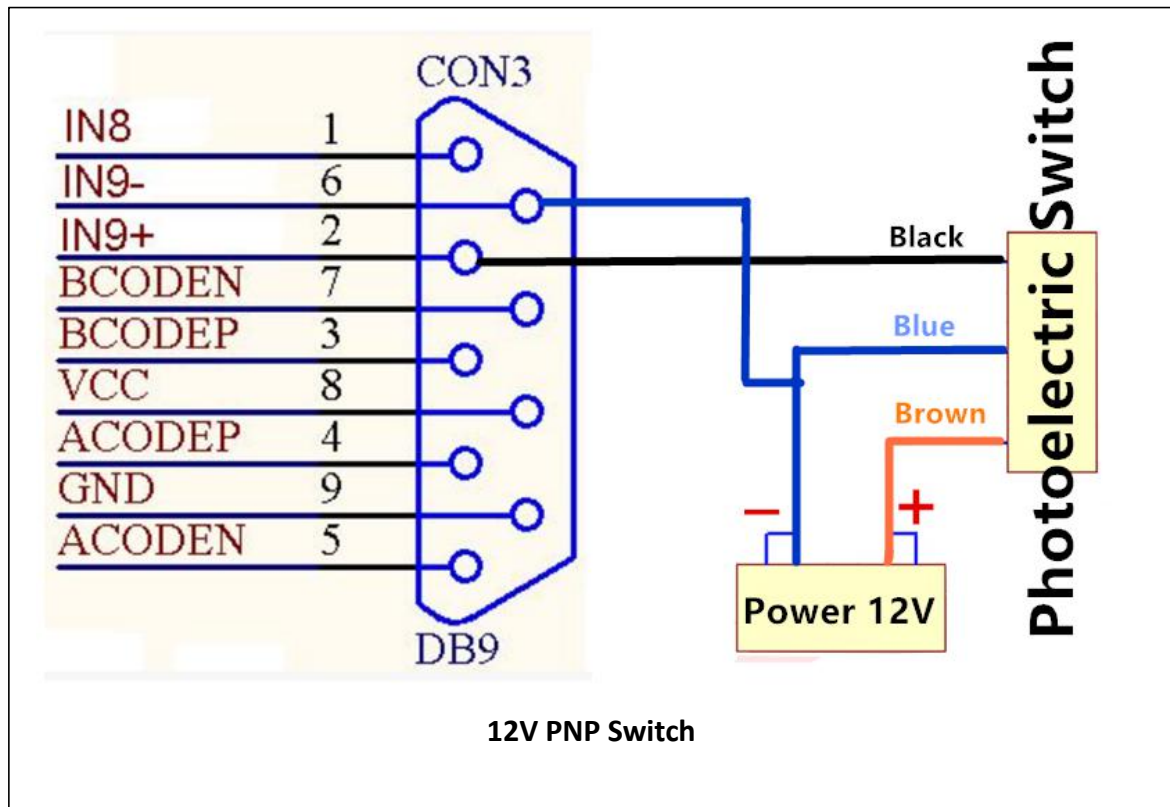
Windows 8 Professional /Corporate /Ultimate 32/64bit

Windows 8.1 Professional /Corporate /Ultimate 32/64bit

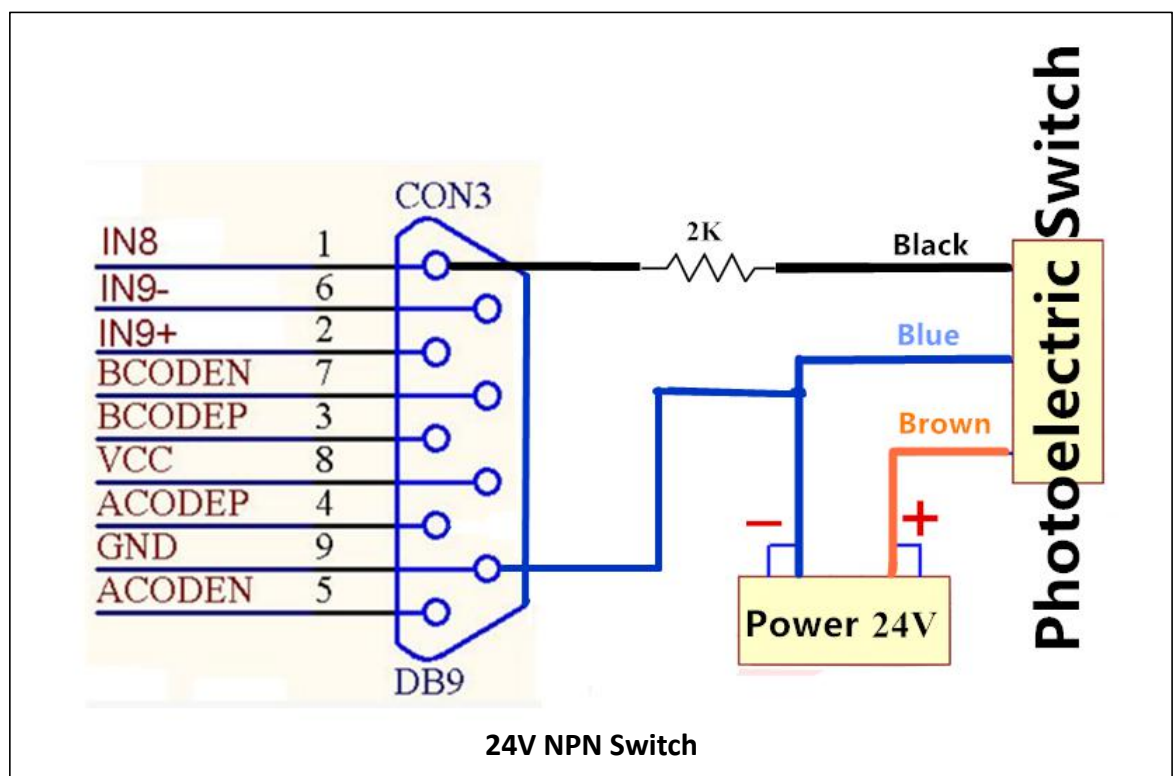
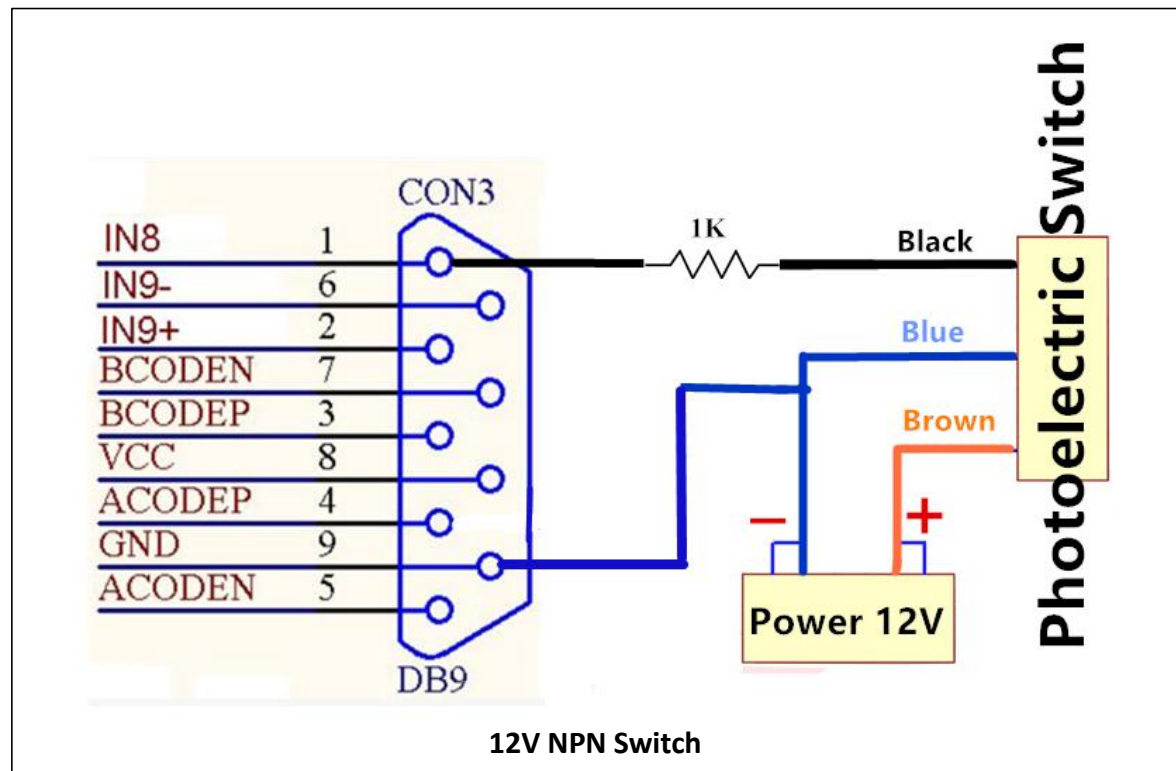
Windows 10 Professional /Corporate /Ultimate 32/64bit

How to connect the Photoelectric Switch

1. PNP Switch

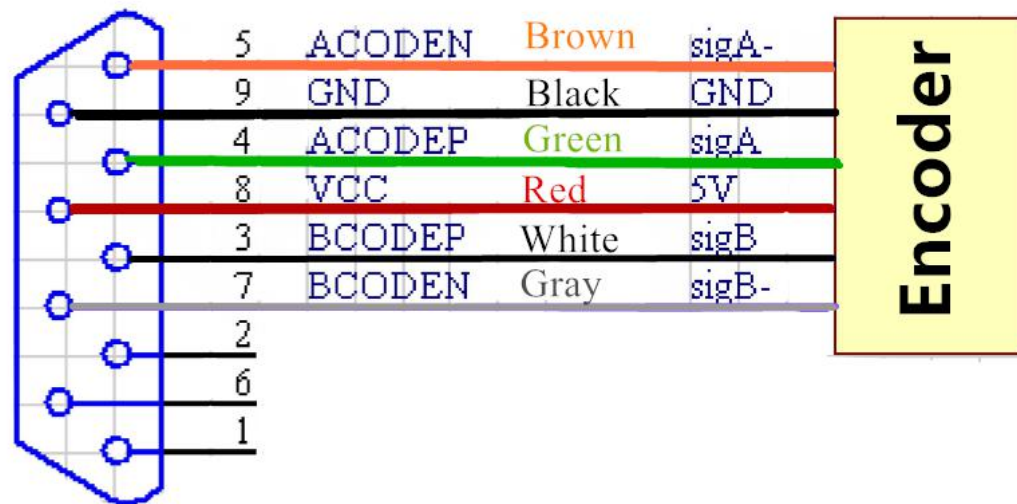


2. NPN Switch



How to connect the Encoder on the LMC card

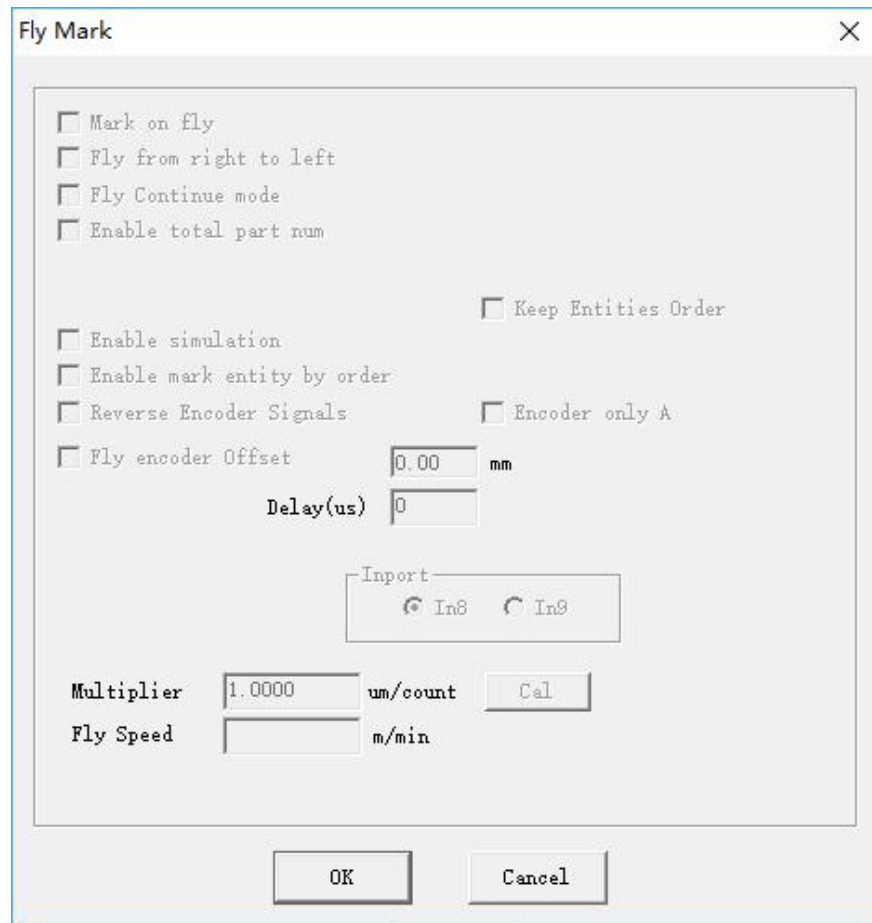
Notes: Need Differential Encoder (A+ A- B+ B- Z+ Z- 0V 5V)



CON3 DB9

Software Function

Open software , F3 - Other - Fly mark , presenting the dialog box shown in below graph.



1. Mark on fly

Choosing this item refers to enable “Fly mark” function.

2. Fly from right to left

Choosing this item indicates that stream line direction is from right to left.

3. Fly continue mode

Choosing it indicates mark object is continuous one, namely, we need to mark content on continuous object. (Such as: wire, cable and so on).

4. Enable total part numb

Selecting it indicates the mark “total number” set is effective.

5. Enable simulation

It indicates that using simulation hardware method produce linear speed. It requires appointing speed.

6. Reverse Encoder Signal

Simulate the situation that the encoder is rotating reversely. If this option is checked all the pulses are negative, which means that the speed is negative. When the pipeline moves if the speed shown in software is negative, choose this one.

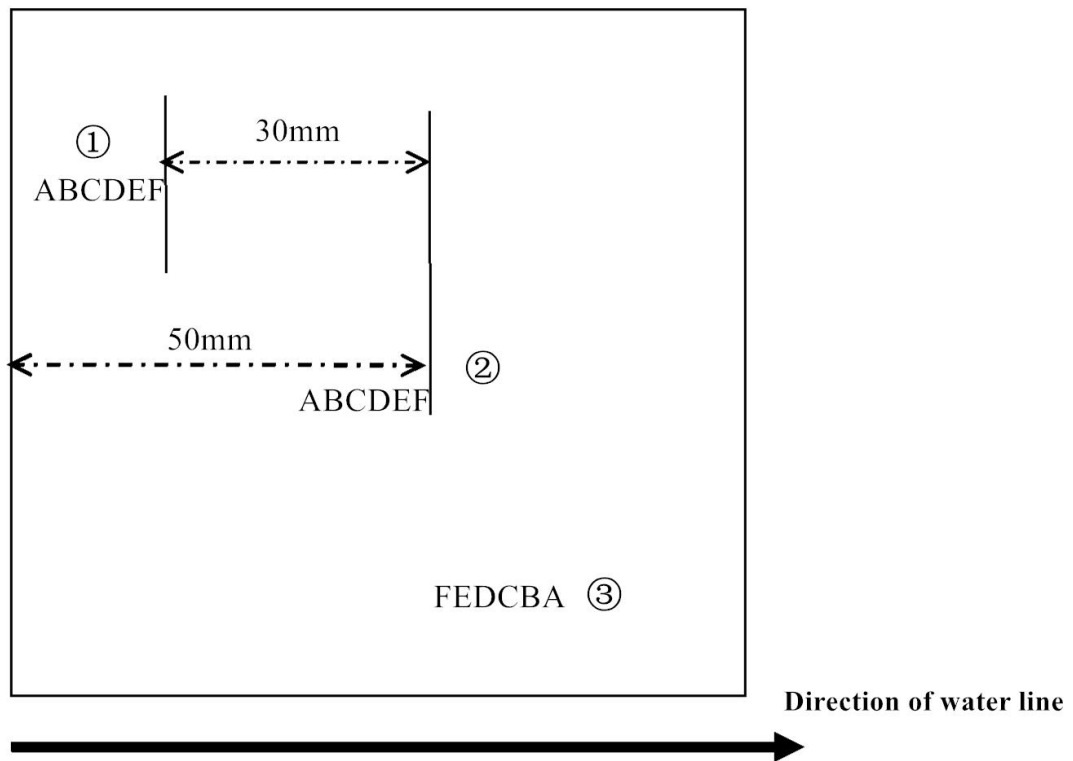
7. Fly encoder Offset

The position of marking is in front of actually.

As suggested in the picture below, assume ABCDF is the content that you want to mark, usually the content is put in the middle of the working area at ② . When the pipeline moves from left to right the software will mark sequentially from right to left, therefore the sequence of marking will be FEDCBA. Because the pipeline is moving the actual marking position will probably at ③ . In another word the while the pipeline moves the scanhead moves along with it. So the distance between characters are related with the speed of pipeline. As the speed goes up the distance gets wider and eventually the character will reach the edge, so if the character is located at the center of the working area, the actual mark able area is is between character F and the left threshold.

If the speed still needs to increase, the position of characters should be positioned at ① (moved to the left). This will give you extra 30mm to work with. You will still need to put all you characters in the working area or the won't be marked correctly. So the actual threshold will move 30mm to the left. But still you won't be able to use the full accessible area of scanhead.

To solve the problem we design a parameter "encoder distance offset", by setting that parameter a virtual offset is set up. If you put the pattern ② and set the encoder distance offset is set to -30mm you will get the same result as putting pattern at ② Theoretically, the up limit is 50mm which is the distance between F and left edge.



8. In Port

Choose port of flying signal for Board Version 2.12.0 or update.

Choose IN9 with PNP Switch , IN8 with NPN Switch

9. Multiplier

The calculation formula is shown as follows:

Fly speed coefficient = perimeter of coder tachometer wheel / coder pulse per revolution.

Calculate: This button is used to calculate the on-fly coefficient. After the pipeline runs

For a while, measure how long it goes, fill in the blank and the software will calculate the coefficient.

10. Fly Speed

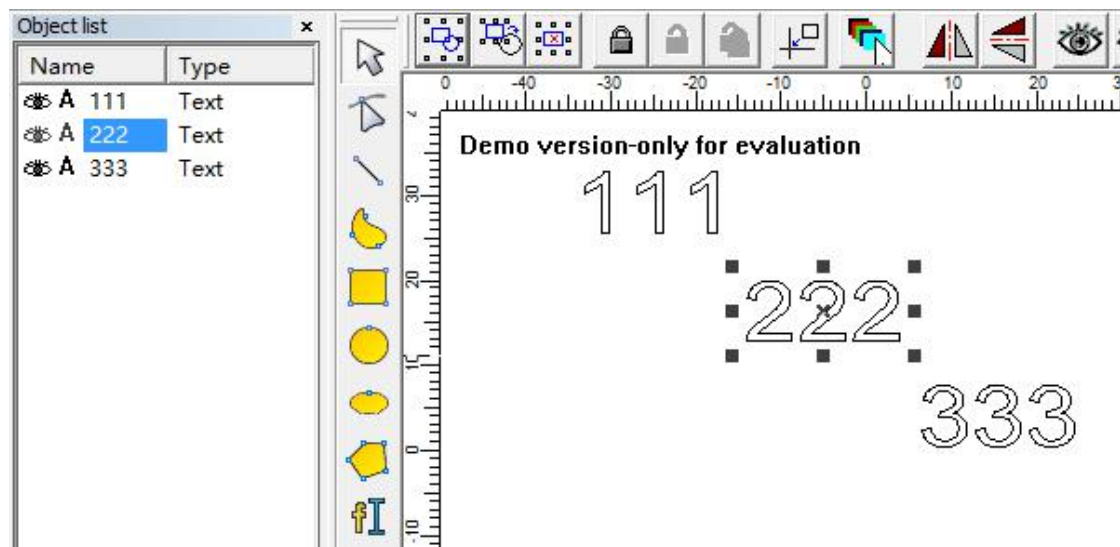
It a window that shows speed of the marking objects from encoder.

Notes : With Enable simulation , Please set the water line speed here.

11. Enable marking entity by order

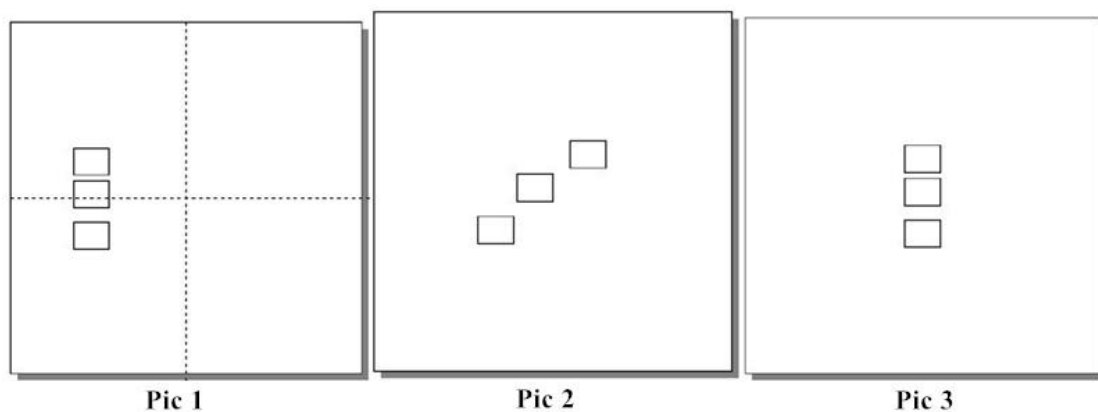
Selecting it indicates that software will mark content according to its order in the list in turns. Otherwise, software will mark content according to its position in working space from left to right.

As this picture shows: in the target list the order is 1-2-3, if don't choose the Keep Entities Order option, the marking order will be 3-2-1, if Choose, it will be 1-2-3.



12. Keep Entities Order

This is a optimization of on-fly marking process, assume you draw a pattern like pic 1, you will probably end up with something like pic 2. Check this option if you want to maintain the pattern.

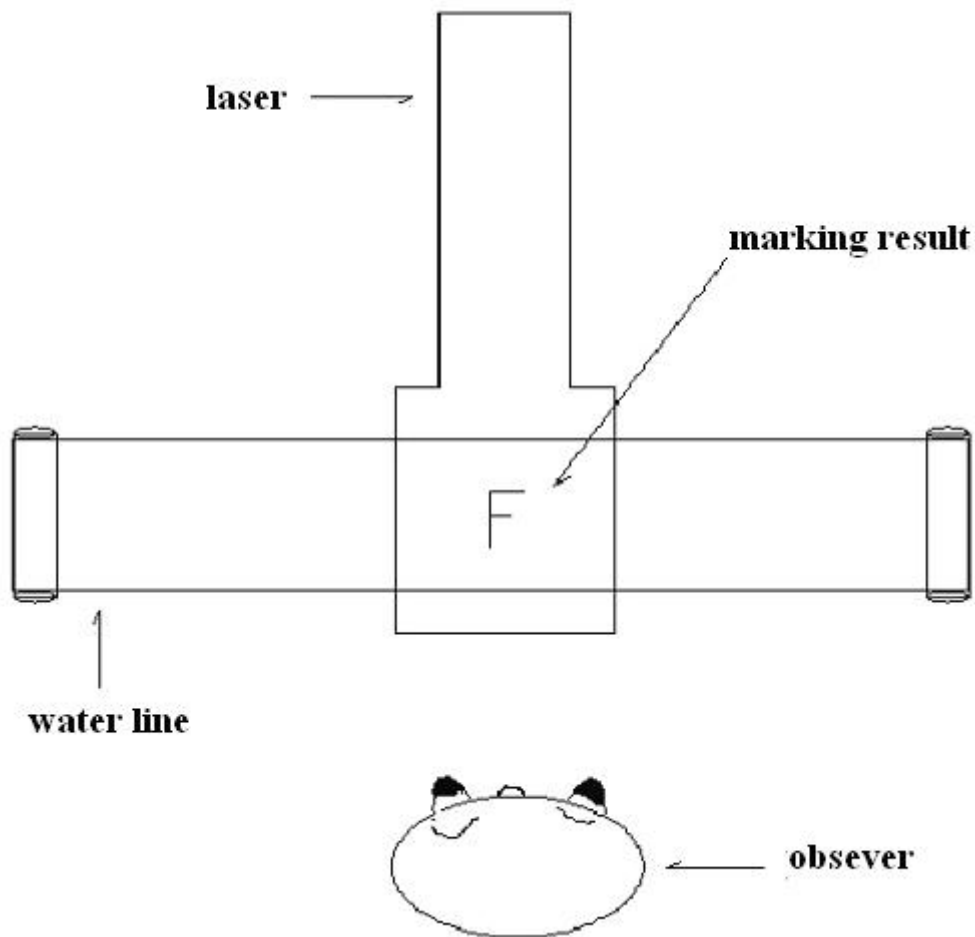


Operate Step

Step 1 : Preparation

Before you try to adjust your system, there are a few things that need to be clarified.

1. Please use the newest driver and software available.
2. Please note the position of the observer and the equipment shown in the picture below. Every statement we are going to make is based on that point of view. Also make sure that the pipe line is parallel to the x axis.



3. Please set Galvo 1=X in the software (press F3 --- Field --- Galvo 1 =X), then adjust the direction that the two mirrors move to make sure that the F you marked is just like the one shown in this picture

Configuration Parameters markcfg0

Field | Laser Control | Port | Other | HardInfo

Aspect

Field Size 100.00 mm

Offset X 0.000 mm

Offset Y 0.000 mm

Angle 0.000 Degree

☒ Galvo1=X

☐ Galvo2=X

☐ Use correct file

Step 2 : Scanner calibrate

A accurate scanner calibrate is needed before you perform On-fly mark. Ezcad supply 2 method to calibrate the scanner.

1. **9 Point calibrate** : Please double click Corfile.exe and follow the instruction. 【If you have problems ,please read the Manual of 9 Point calibrate. 】 After you get the .cor files , please upload it in the software.

☒ Use correct file

>>

2. **Inside calibrate** : Calibrate the scanner with inside method .

Galvo 1

☐ Negate

Scale 100.0000 >>

1.0000

1.0000

1.0000

Galvo 2

☐ Negate

Scale 100.0000 >>

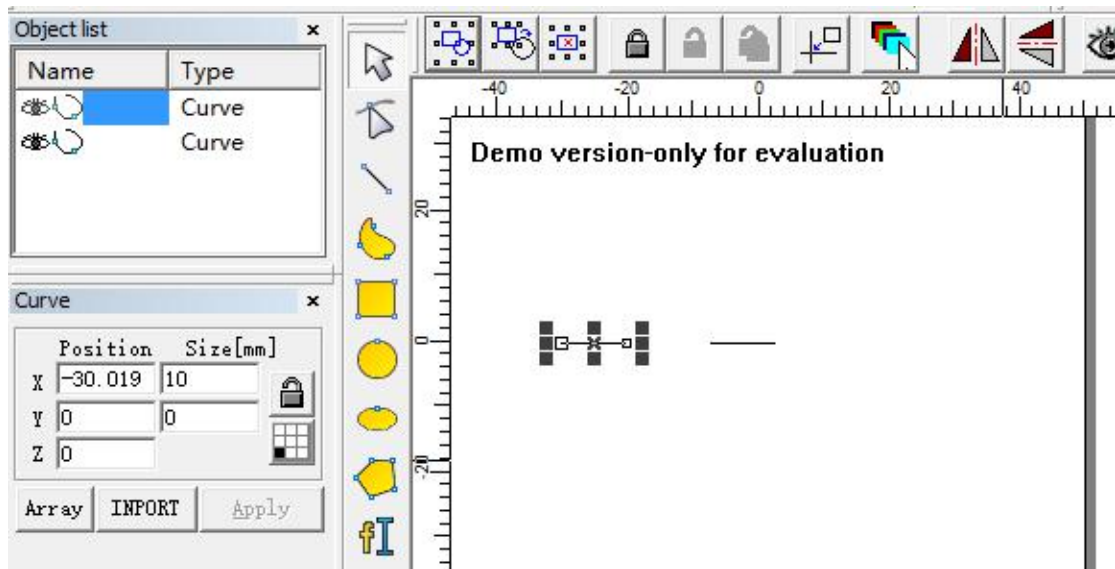
1.0000

1.0000

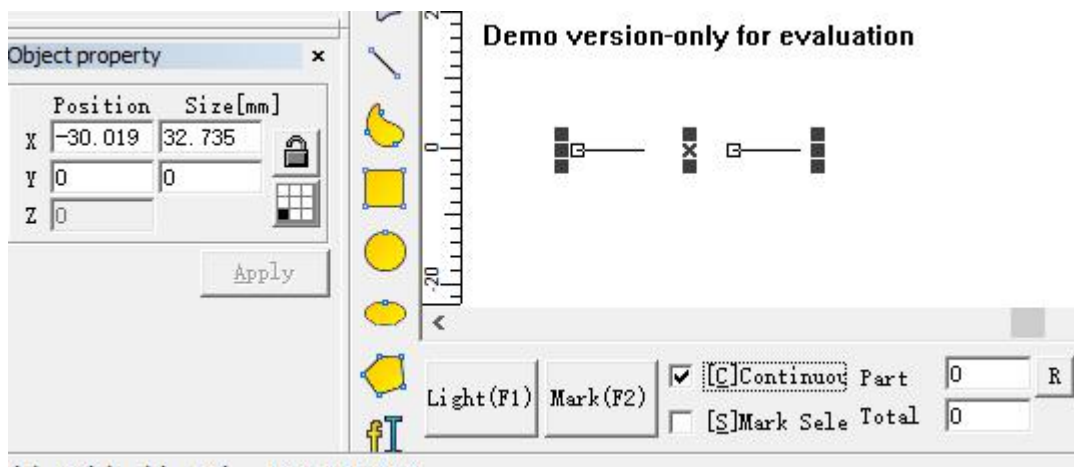
1.0000

Step 3 : Adjust position

In the software ,Draw 2 short line , and make sure they are on the same line.



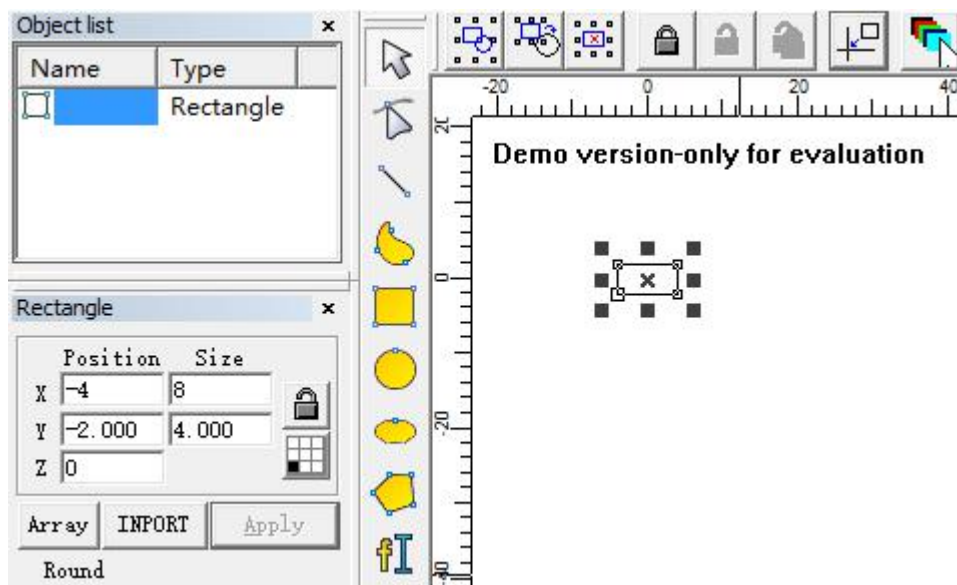
And Choose Continue mark , move your water line with a very slow speed .



Check the marking result . And move your water line or your marking machine very slowly , until the two short line is one the same line .

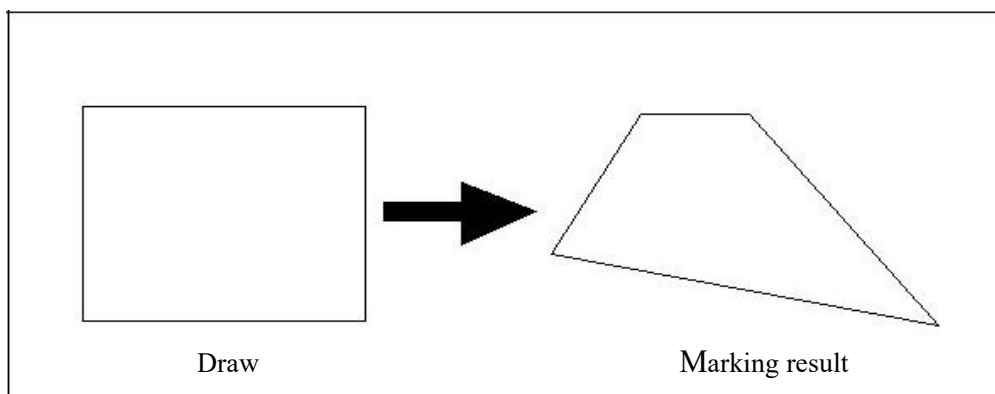
Step 4 : Adjust the Multiplier

Draw a square ,such as 8*4 , mark it with a stable water line speed , check the result. And adjust the multiplier until the square **Complete closure** .

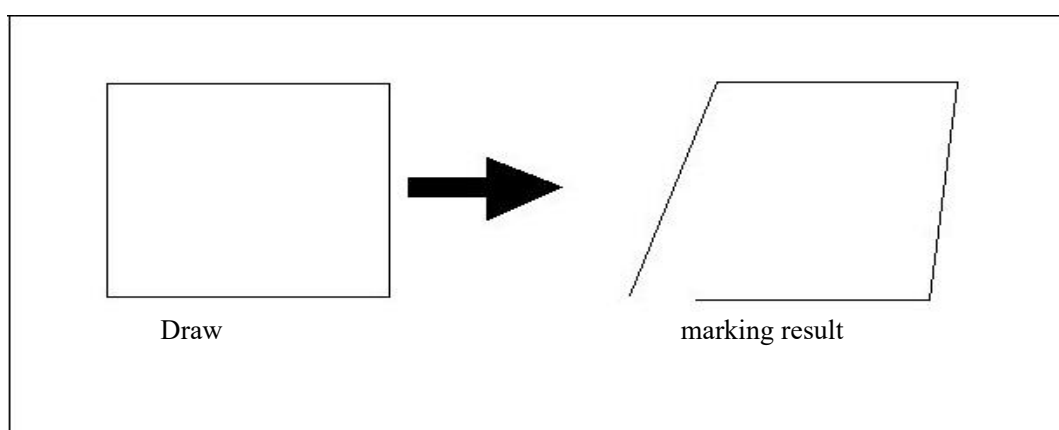


There maybe some result like below :

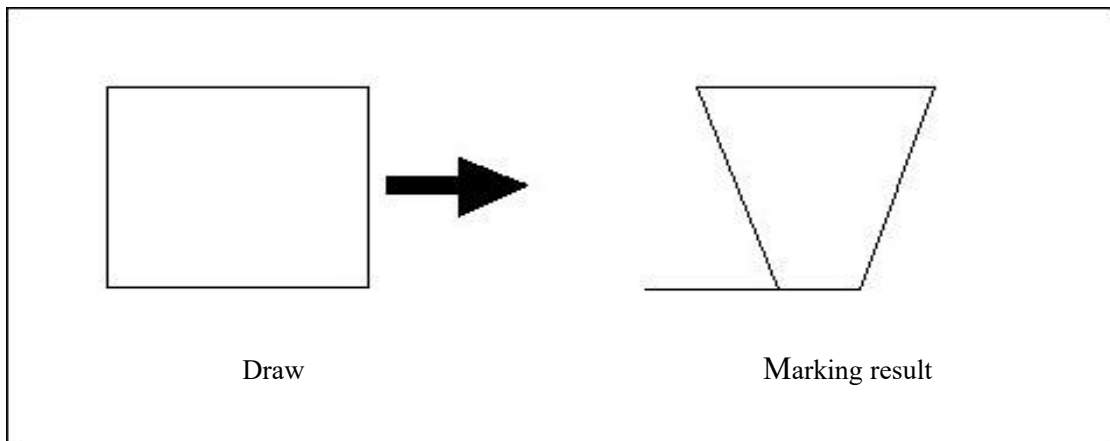
- This is because you mistakenly wire the X,Y signal to each other.



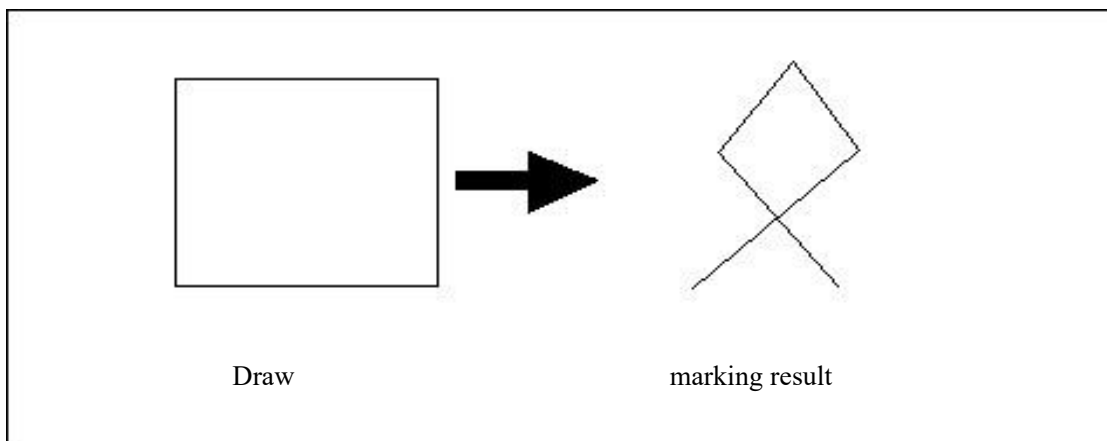
- This is because the on_fly coefficient you filled in is smaller than the actual one.



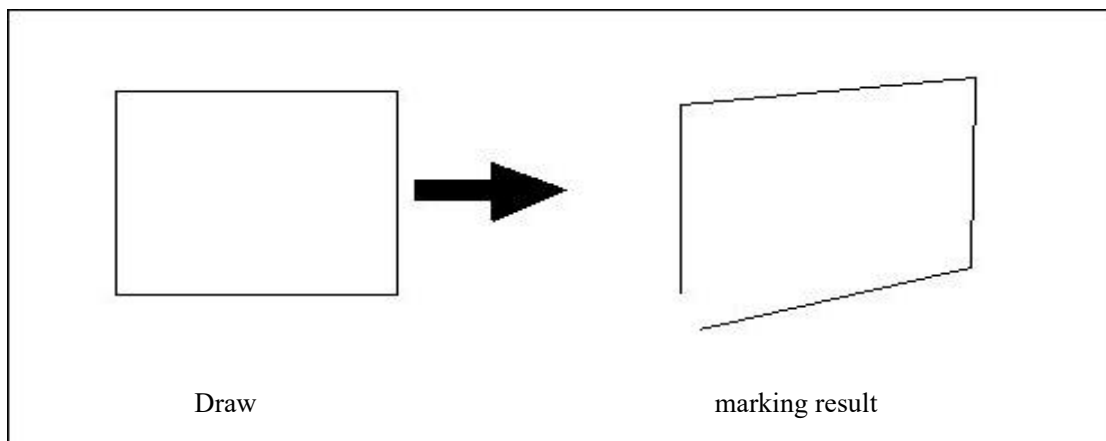
- This is because the on_fly coefficient you filled in is larger than the actual one.



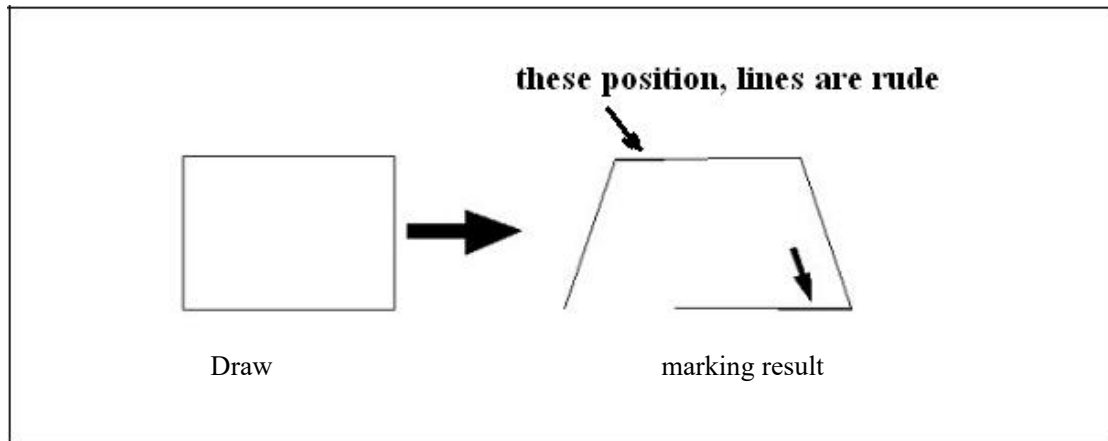
- This is because you choose mirror 2 as X, please go parameter-area and choose mirror 1 as X.



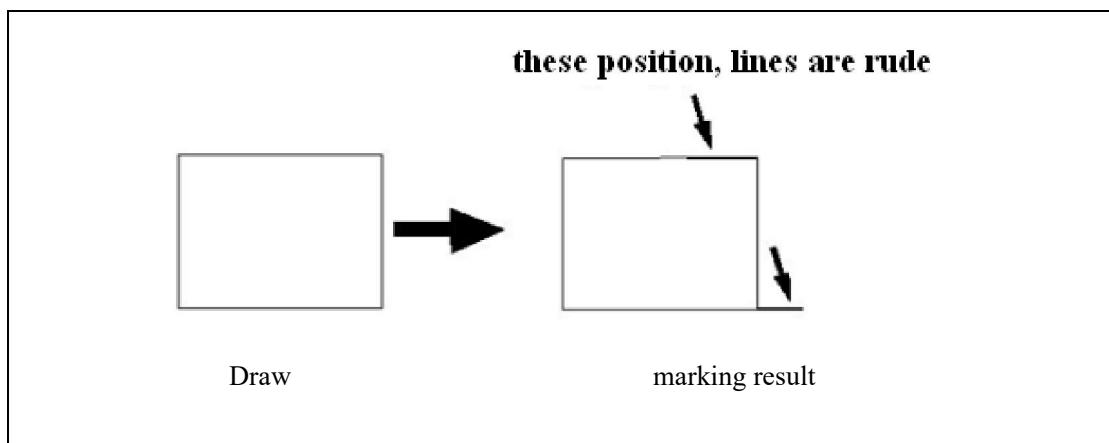
- This is because the pipeline is not parallel to the x axis.



- This is because you accidentally check the "encoder reverse" or your encoder is actually giving a negative speed.



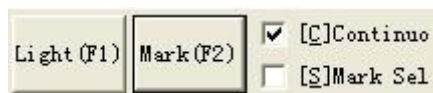
- This is because the scanhead isn't fast enough or the pattern you draw is out of working area.



Step 5 : Mark and adjust the speed / TC

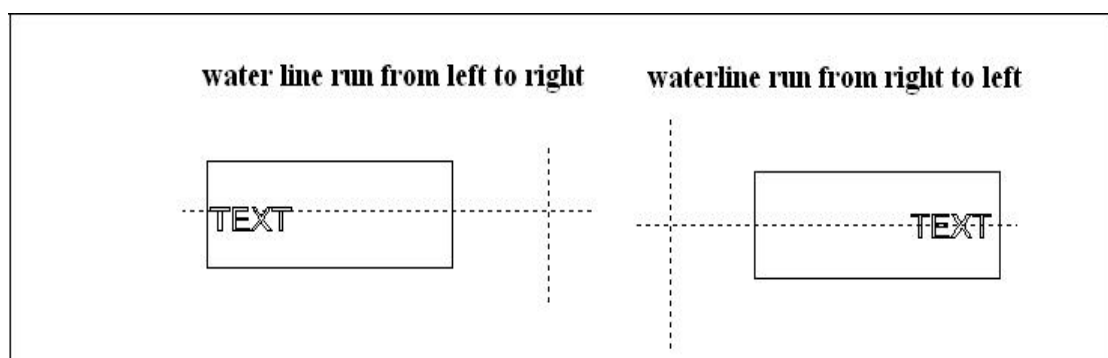
Set the mark files and Mark , adjust the marking speed and the TC to make a better result.
(The Definition of the TC , please read the standard software manual)

- Set the parameters correctly such as: speed, jump speed and all kinds of offsets. While maintaining the satisfying results the time duration of marking should be minimized.
(The main goals here is to adjust the marking speed and the jumping speed much greater than the pipeline speed. Otherwise it would be possible that before marking is finished the target has already moved out of the mark able area.)
- Generally the marking speed should be much greater than the pipeline speed.
- It's crucial that all the content you want to mark is in the working area.
- If the pipeline is moving in a high speed, please adjust the jumping speed and the jumping position offset we advice that jumping speed be maximum. When working in the On-fly mode, in current version of the software the continuous marking option must be selected.



Note

If the pipeline moves from left to right, the pattern or characters you want to mark should be put at the left threshold of the working area. The same rule applies when your pipeline moves from right to left, put your pattern on the right threshold. This is to allow the marking start as soon as a object is detected so the situation that the scanhead has to move to where the pattern is will be avoided.



Common problem and solution

1. Software on-fly and hardware on-fly

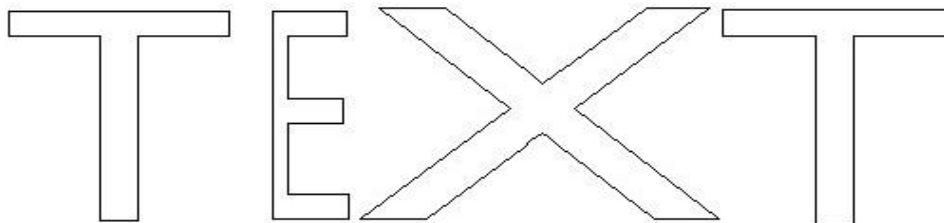
Software on-fly is a method that is used in the early version of our system. It simulates the movement of pipeline by software, therefore it's slow. To address that problem we developed the hardware on-fly method, it utilized a IC to calculate the movement and adjust the marking process.

2. Under on-fly mode, the timer and output/input ports aren't working.

Under on-fly mode, the software will change each target into a curve type object and meanwhile ignore everything that isn't a curve. So a timer will be ignored. If a non-curve object do be necessary please check "**Enable marking entity by order**" option.

3. The character is not equally big/wide.

If this happened you will need a encoder because the reason this happen is because that the pipeline is not moving in a constant speed while you assume it is. If you already had one working you need to adjust the on-fly coefficient to make it very accurate. Meanwhile all the offset and delays should be minimized. Also check if there is a tight grip between encoder and the pipeline.



4. In a continuous marking process, how to stop for a while after marking each pieces?

There are 2 ways to do this :

- 1) Go parameter-other-on-fly marking, check "**Enable marking entity by order**" option, then add a timer in the object list.
- 2) If you have a encoder to monitor the pipeline you can else choose a proper "encoder distance offset".

5. How to get "on-fly coefficient"?

On-fly coefficient = the distance pipeline moves for each revolve of encoder / pulse per encoder

Use the build in calculator:after the pipeline runs for a while, measure how long it goes, fill in the blank and the software will calculate the coefficient.

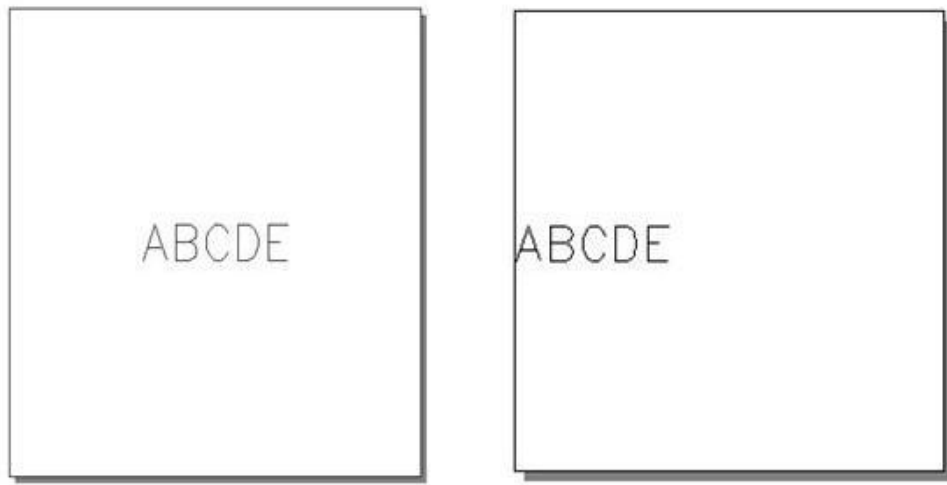
6. If the pipeline is unstable, which affects the marking, how to deal with that?

If this happens, it means that the software failed to respond to the speed variation of pipeline. To solve this problem we advice that while maintain the satisfying results set the beginning offset as small as possible.

7. It works fine while the option "continuous marking" is not checked, if it's checked there's no laser at all.

If this happens please check the "start marking port", for USB card it should be IN8 or IN9. Also check the wiring and all the equipment if they are working properly.

8. While marking that the pattern should be positioned at the edge at the working area. If pipeline moves from left to right then put it at the left edge. The same goes for the opposite.



Note:

If the result is not satisfying please recheck the wiring and the key parameters. For technical support please contact us.

Beijing JCZ Technology Co., Ltd.

Add: M3 building, No.1 East Road of Jiuxianqiao ,Chaoyang District ,Beijing ,China ,100016

Tel/Fax: +86-10-64426995/93

Email : Sales@bjcz.com Sophy@bjcz.com Technic@bjcz.com

Web: en.bjcz.com