S80 High-Level Automatic Cutting Machine User's Manual

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I. Instructions for use

1.1 Cautions

To use and operate the cutting machine correctly and to avoid potentially hazardous situations, it is important to comply with the contents of the instruction manual.

- The instruction manual provides the most important information for the operator to operate the machine safely;
- Anyone operating the machine must follow the instruction manual, especially the safety instructions;

In addition, to avoid safety accidents, the rules and regulations must be placed next to the operating machine, and the people involved must follow them.

Some special symbols are used in this instruction manual to indicate the following meanings:

Hazard Symbol

This symbol implies an immediate threat to an individual's life and health, and violation of these may cause serious harm to life and health.

Important Information and Tips

This symbol implies an important reminder of the correct operation of the machine, violation of which may result in the machine not functioning properly or damage to related parts.

1.2 Operator Responsibilities

The operator must observe the following before using the machine:

- Knowledge of basic job safety and accident avoidance rules, training related

to cutting machines, and ability to properly operate and use cutting machines;

- Has read the safety sections and warning notices in the instruction manual, understands them, and has signed to verify them;

Operators responsible for safety must check the safety awareness of their work without interruption.

1.3 Personal Responsibilities

Before anyone uses the machine, be sure to observe the following:

- Observe the basic rules of work safety and accident avoidance;
- Read the safety sections and warning notices in the instruction manual, understanding them, and having signed to verify them;

They must confirm by their signature that they have understood the content of the safety sections, warnings, and hazard notes.

1.4 Operational Hazards

The machine is manufactured by the standards of technical and safe rules. Nevertheless, its use may pose a danger to the operator or other persons and may cause damage to the machine (or other parts) or equipment.

The machine must be used under the following conditions:

- Normal use;
- Use under relevant safety conditions;

Any interference that could damage the safety of the machine should be corrected immediately!

1.5 Correct Use

We have designed the machine to be used under the conditions of the "Use of the

machine" section, and it is not appropriate to use the machine for any purpose other than its normal purpose, and the company will not be liable for the use of the machine under these conditions.

Proper use also includes the following:

- Observe all notes in the instruction manual;
- Keep up with inspections and maintenance work;

1.6 Rights and Obligations

The relevant terms and conditions regarding the sale and delivery are readily available and the user can contact us quickly through these. There is no coverage for injuries or damages caused to an individual or brought about if the injury or damage is caused by:

- Incorrect use of the machine;
- Incorrect assembly, operation, control, or maintenance of the machine;
- Unauthorized individuals perform assembly or maintenance work;
- Operating machines with safety defects or safety equipment that is not properly assembled or is not fully functional;
- Failure to follow the instructions in the instruction manual for transporting, storing, assembling, initializing, operating, maintaining, and preparing the machine;
- Altering the structure of, or connecting to, a machine for which there is no authorization;
- Use or replace non-original machine parts;
- Use of defective machine parts;
- Incorrect repairs;
- Damage to the machine caused by external objects or high pressure;

1.7 Security System

1.7.1 Organizational Measures

- Emphasize the need for the individual operator to protect the equipment;
- All existing safety equipment should be regularly inspected;

1.7.2 Safety Equipment

- Before using the machine, all safety equipment must be properly installed and functioning;

  Safety devices can only be removed under the following conditions:
- The machine is stopped and will not be turned on again unscheduled;
- According to the system, safety equipment should be correctly installed by the operator when handing over components;

- Changes in the structure of machines or adjacent equipment must be accompanied by the installation of safety equipment that meets the appropriate requirements, and the safety equipment must be verified by the relevant safety personnel;

1.7.3 Informal Security Measures

- The manual should always be kept at the machine's workplace;
- In addition, general safety rules and local regulations for accident avoidance and environmental protection should be readily available;
- All signs regarding safety and machine hazards should be kept in an easily visible place;
- Only trained and designated personnel can use the machine;
- Personal responsibility should be clearly understood when assembling, operating, preparing, maintaining and repairing machines;

- Trainers should only use machines under the supervision of experienced and trained personnel;

1.7.4 Machine Control

- Do not make programming changes in the software under any conditions;
- Only trained and qualified personnel are allowed to operate the machine;

1.7.5 Safety Measures for Normal Use

- Operate the machine only when all safety equipment is working properly;
- Before turning on the power, make sure that starting the machine cannot hurt anyone;

- Check that easily detectable hazard markers and safety equipment function properly at least once each time you move the machine;

1.7.6 Hazards of Electricity

- Compliance with safety regulations by DIN, VDE, and EN permits only experts to carry out energized work;

- The machine's electronics should be checked regularly;
- Only authorized personnel are allowed to open and use it with a key or tool;
- Loose connections, damaged wires/cables, or other safety-related damage should be removed or corrected immediately;
- The electrical cabinet and clamp box should remain closed;
- As the work requires the output voltage, valid safety regulations should be adhered to by DIN, VDE, and EN;

1.7.7 Hazards of Gas Use

- Pneumatic applications should only be used by persons with specialized

knowledge and experience in the field of pneumatics;

- Parts of the system and the pressure lines that will be opened should be free of pressure before work;
- The gas pipeline should be reasonably replaced, even if they do not show relevant safety defects;

1.7.8 Special Hazards

- See Chapter 8.2 for a list of hazards

1.7.9 Storage, Transportation, and Handling Conditions

Storage and Transportation Conditions

Ambient temperature: -25-55 C°

Ambient humidity: less than 80%RH

Operating Conditions:

Temperature: 5-40 C°

Relative humidity: below 10%-80%RH

Installation altitude: absolute altitude below 1000 meters

Power supply voltage: 380V (three-phase five-wires) (within +/-10% error)

Power supply frequency: 50±1HZ

Power supply line: the power supply line of each electric control box must be connected to the terminal in the electric control box through the waterproof connector.

Power protection: the main power line must be connected to the equipment after passing through the voltage stabilization device (equipped by the customer according to the actual demand).

Personal protection: no mandatory personal protective equipment for operators, operators can be equipped according to the actual personnel.

1.8 Service and Maintenance

- Requirements for conditioning maintenance and inspections should be carried out regularly;
- Before maintenance and inspection work, notify the appropriate operator;
- All components and operating media before and after the machine should be guaranteed to be used under license, e.g. pneumatic and hydraulic;
- During all maintenance, inspection, and repair work, the machine should be placed in the no-voltage state and the main switch should be ensured to be placed in the off state;

  If required, close and lock the main switch;

  Lock the switch and place a warning sign to stop the machine from powering on again;
- When location changes are required, larger component groups should be moved safely using a lifting device or platform;
- After completing maintenance work, the functionality of the safety equipment needs to be checked again;

II. Introduction to the system

2.1 Scope of Application

This machine can only be used in an efficient range of applications: cutting single or multiple layers of fabrics, mainly textiles. The number of layers and the height of the fabrics to be cut depend on the construction of the machine, the type of fabric, and several other relevant factors.

This machine can only be used in the special range mentioned above, not elsewhere.

The company will not be responsible for damage caused by abnormal operations. Effective use is as follows:

Comply with all terms and conditions stated in the operating manual

Comply with all terms of inspection and maintenance requirements

2.2 Basic Introduction

This system is an operating program for cutting machines. It makes the automatic cutting machine operation comfortable and simple and can be widely used. In addition to being able to realize basic functions, such as loading and processing markers, starting and cutting, etc., the system likewise has the function of parameter modification in real time, redistribution of the parameters of the notches and cutting, and the ability to find the breakpoint to continue cutting after the machine is interrupted.

The system provides the operator with a simple and easy operating environment that can be learned quickly even by those who do not have a basic knowledge of computers. This manual will help you use the system quickly and be a good machine maintainer in the future.

Beginners reading this book should test the corresponding functions of the system whenever possible. This book is made easier to use by accompanying the corresponding steps with corresponding screen pictures.

This introduction is closely followed by a description of the system. In the last chapter, you will find a list of functions and some tailoring of the structure, for which the service sector may be of more interest.

Feel free to offer your thoughts and suggestions, we are very much looking forward to hearing from you.

2.3 System Description

2.3.1 Necessary Hardware

CNC industrial computers are used for operating systems.

VGA graphics cards and high-resolution monitors.

To be able to handle a large number of files and a large number of points, at least 1GB of RAM and a 2GHz processor are required.

2.3.2 Required Software

In terms of the operating system, Windows 10 is required

If the operator of the cutting machine has administrator privileges, we strongly recommend that you run the disk defragmenter program regularly, as this is a guarantee that your computer will process data at high speed.

2.3.3 Overall Appearance

The overall appearance of the cutting machine is shown in Figure 2-1.

Figure 2-1 Cutting machine model S80

2.3.4 Control Panel

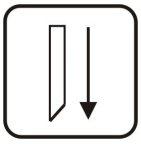
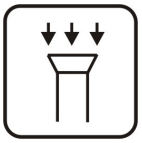
The control panel of the cutting machine is shown in Figure 2-2, using which the cutting machine can be operated manually.

Figure 2-2 Cutting Machine Control Panel

Attention:

Individual operating keys and sequences may vary depending on machine build and options. The machine can only be used if the main switch is turned on and the machine

is unlocked. The keys can only be operated in manual mode, except for individual keys.

Buttons	Function Description
	EMERGENCY STOP: Press this button in an emergency and it will stop all movements of the machine.
	POWER START: Turn this switch on to supply power to the servo.
	Power Off: Press this key to turn off the servo power.
	Lower Knife: In manual mode, use this key to lower and lift the knife.
	Lateral Cutting: In standby mode, press this key to perform a lateral cutting.
	Vacuum On/Off: With this key, the vacuum can be turned on/off.
	Manual mode on/off: Use this key to toggle the manual/standby operation mode, the light

on it is on to indicate that the manual mode is on.

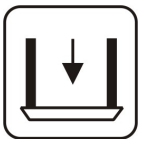
Knife Drive On/Off: In standby mode, use this key to turn the knife drive on.

Confirmation: Use this key to acknowledge a single pair of edge points when starting the trimming initialization sequence.

Locate the cutting area.

Reopen Cutting: Use this key to re-cut a stopped program.

Initialization sequence: rechecking the opposite edge points can be skipped and the cutter starts cutting immediately.



Lowering the knife plates: In manual mode, pressing this key will lower or raise the knife plates.

Interrupt: Pressing this key the initialization sequence can be interrupted and the cutter returned to the starting point.

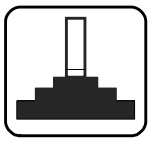
Stop: Stop the cutting program - use restart to continue cutting or to restart marker processing.

Mane Brick Conveyor Belt Forward: Press this button to tap the mane bricks forward.

Mane Brick Conveyor Belt Back: Pressing this button Mane Brick can be nudged backward.

Manual Bitefeed: simultaneous synchronized movement of the collecting table and the bristle bed.

Mane bed automatic conveyor: in standby mode, with this key, the mane bricks can be automatically moved forward a parameterized distance. Automatic cleaning of bristle beds: In manual mode, turn on the vacuum function and press this key to carry out automatic cleaning of bristle beds. The vacuum is used to suck up dust and rags during the cleaning process. To avoid the vacuum effect must be careful not to have adhesive paper over the bristle bricks, also note that the adhesive paper should be rolled up on the rod so as not to be sucked into the bristle bricks.



Joystick control button: In manual mode, when shaking the joystick, you have to press this button at the same time for the cutting head to move. After pressing this key, the laser light will be on. The duration of the laser light can be set by the software.

The laser point offers the possibility, which is linked to the software, to compare the dimensions of the entire nest with the actual fabric position on the cutting table. If the actual fabric placement is not straight, the initialized reference point can be adjusted with the laser point. Once the reference point has been confirmed, the machine makes automatic parametric compensation adjustments for the fabric that is not straight.

Sharpening button: In standby mode, pressing this button will start sharpening the knife, in manual mode pressing this button will only turn the grinding wheel.

2.3.5 Description of Basic Machine Parameters

Maximum line speed: 100m/min

Maximum acceleration: 9.8m/S².

Maximum blade frequency: 6000rpm

Cutting range: Length: 1800mm Width: 1800mm/2200mm

Cutting thickness: 80mm

Maximum Negative Pressure: ≧-0.2Bar

Noise: <75db

Supply voltage: 400V(3P+N+P)±5% 50Hz

Power: 34KW

III. Operational Process

3.1 Process Description

A cutting machine relative to other cutting tools is a more complex cutting machine, any operation may cause greater injury or accident, so the operation of the use of the process should be strictly by the operating procedures.

The operation process of the cutting machine consists of safety inspection, preparation for use, and operation of the cutting machine according to the instructions. This section describes the safety inspection and preparation for use, and the operation process will be described in detail in the next section. It is assumed that the cutting machine has been installed correctly according to the requirements.

Security Checks:

1) Check whether the external power supply is good and the power supply voltage is normal;
2) Check that the external air connection is normal and that there are no air leaks;
3) Check that the cutting head of the cutting machine is working properly and that the cutting tools are complete, including cutting knives, pens, punching tools, refueling, primary and secondary drills, and laser lights;
4) Check bristle beds and conveyor belts for proper functioning;
5) Check for proper vacuum;
6) Check each part of the cutting machine for any obvious damage or abnormality, if so, please repair or replace it promptly;

Preparation before Use:

1) Clean up the environment near the cutting machine to prevent operators from slipping and falling due to the ground conditions;

2） Check for obstacles around the cutting machine and put up signs to remind other people to stay away;

3） Turn on the external main power supply of the cutting machine and check if it works properly;

4） Turn on the power of the cutting machine and check whether the cutting machine is normal and whether the signal indicator is normal;

5） Turn on the power of the controller, start the industrial computer, and check whether the installation of the control software and cutting software is completed.

If all the above work has been completed and there is no abnormality, the following can operate the cutting machine. To prevent accidents, they use the first simple test or empty cut to ensure that the cutting machine works properly and then carry out the normal cutting process, the specific operating procedures will be in the next section for a detailed introduction.

3.2 Operational Processes

Procedure for Using a Cutting Machine:

First, turn on the external power and air connections; second, turn on the power to the cutting machine and activate the CNC controller; finally

Locate the cutter software icon  and double-click (or right-click) to open the software.

After opening the software of the cutting machine, the software is in a locked state, if you want to operate the cutting machine, you must first open the power switch  on the control panel of the cutting machine, and then click on the software unlock button  , then you can carry out various operations on the cutting machine.

3.2.1 Functional Testing

The digital signal input/output window is the collection of each action of the cutting machine and monitors whether each function of the cutting machine operates normally, so it is particularly important to test the digital signal input/output window.

1) Control Panel Testing

Cutting process, in manual mode to use the panel of the various functions, to ensure that can be normal cutting, to test the panel of the various functions. The panel test includes knife plate lift, knife drive lift, lateral cutting, knife drive vibration, vacuum switch, laser light, rocker and sharpening, and so on.

3) Positioning Test

Click the "Positioning" button on the toolbar allows, you to test the positioning function, which tests whether the connection between the software, the driver, and the cutting machine is normal.

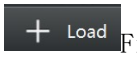
3.2.2 Empty Cutting Test

Empty cutting refers to the cutting process without sharpening, refueling, laminating, bitefeed, or other functions and normal cutting is the same. The main purpose of the empty-cutting test is to detect whether there is any abnormality in the cutting function and to determine a cutting path on the fabric.

Assuming that the previous steps have been completed, the steps for the empty-cutting test are as follows:

(1) Click the "Empty Crop" button on the toolbar  to open the Empty Cutting function and test the Empty Cutting function;

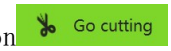
2) Confirm that the function display icon in the upper right corner of the interface is displayed normally;

3) Click the Open 

File button to enter the folder selection interface;

4) Select the CAD folder;

5) Select the CAD file  and click the Add button to add the CAD file;

6) In the work queue window, select the CAD file to be cropped and click the button 

to enter the cutting interface;

7) Click the Start Cutting button  to enter the positioning state;

8) Operate the rocker on the control panel to locate the specified position;

9) Click the confirmation button 

on the control panel three times to start the empty-cutting process.

3.2.3 Normal Cutting

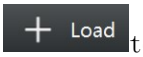
If the above instructions and steps are followed and all tests are correct, then normal cutting can be performed. First use the bristle bed drive to bring the fabric to the proper position, cover it with film, and then just start the vacuum to compress it.

The steps for normal cutting are as follows:

1) Click the "Empty Crop" button on the toolbar to close the empty-cutting function;

(2) Check whether the function display icon in the upper left corner of the screen 

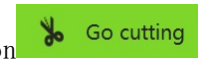
is displayed normally;

3) Click the Open File button 

to enter the folder selection interface;

4) Select the CAD folder;

4) Select the CAD file and click the Add button  to add the CAD file;

5) In the work queue window, select the CAD file to be cropped and click the button 

to enter the cutting interface;

6) Click the Start Cutting button  to enter the positioning state;

7) Operate the rocker on the control panel to locate the specified position ;

8) Click the Confirm button ENTER on the control panel three times to start cutting;

IV. System Functions

The system can be controlled in two ways: using the control panel located on the cutting head beam together with the keypad, or with the keypad alone, which is easier to operate. This chapter will give you an overview of the functions of the control software.

4.1 Introduction to Functions

4.1.1 Marker Processing

1) It can handle file types such as GERBER-ISO-Format;

2) All images can be rotated, scaled, and locally selected;

3) Automatic identification of notches;

4) Automatic sorting;

4.1.2 Cutting

1) Time optimization and movement control under predetermined parameters, such as speed, acceleration, and deceleration;

2) Automatic acceleration and deceleration of speed and acceleration dependent on arc radius and control parameters;

3) Smooth contour line cutting with approximate polynomial curves to ensure maximum cutting speed and reduce machine wear;

(4) The Selection Positioning function is used to locate the uncut pieces during the cutting process;

(5) Automatically lift the knife and lower the knife when the cutting direction changes too much; the change of key angle direction, overcutting, and heelcutting can be adjusted by parameters to optimize the lower knife lifting point and cutting direction;

6) Automatically add a sharpening cycle to the knife lift or if the sharpening distance in the parameter is exceeded it is necessary to interrupt the cutting to sharpen the knife;

7) Reduce the time of empty-cutting by optimizing the order of cutting and the strategy of cutting notches;

8) Provide more possibilities for redefining and adjusting the parameters of the notches;

9) Use the notches tool to work on the cutout;

10) Run an empty-cutting to simulate the cut path;

11) Can handle cylinder fabric cut pieces.

4.1.3 Split Window Cutting

1) End split-window cutting at the maximum X-axis position;

2) Different parameters can be set for different partitions;

4.1.4 Graphics

1) Multi-faceted functions to view marker processing, such as zoom, cut pieces selection, point selection, and cutout display;

2) You can see the real-time position of the cutter knife during the cutting process as well as the part that has been cut;

(3) After cutting an interruption, you can write down the interruption point so that you can continue cutting.

4.1.5 User Parameters

1) Different types of parameters can be modified to suit different applications;

2) Easy parameter modification interface;

3) Free size selection;

4) Optional classification parameters;

5) Automatic consistency check;

6) Provide different help files for all parameters;

7) The loading of data is dependent on the setting of parameters;

8) Generate and save new parameter settings;

9) The use of the tool also depends on the parameterization.

4.1.6 Standard Control Functions

1) Machine positioning;

2) No need to return to zero after emergency stop;

3) The machine is unlocked;

4) Suspension and continuation;

5) Cancellation;

6) Control the machine with the control panel switch.

4.1.7 Machines

1) Separate the conveying area from the cutting area;

(2) Tools: vibrating knife, main drill, auxiliary drill, knife cooling, broken knife detection and other devices;

3) Automatically start different drills according to different diameters without changing drills, you can choose one or two drills;

4) Different sharpening strategies: standard sharpening;

5) Automatic knife width correction by parameterized sharpening factor;

6) Automatic refueling for parameter adjustment;

7) Deviation correction of intelligent cutter knife;

8) Adjust the up and down vibration speed of the cutter knife;

9) It is possible to run the C-axis in particular as well as the bristle brick conveyor belt and the receiving table conveyor belt together or separately;

10) It is possible to run the Z-axis in particular;

11) Vacuum size is adjustable;

12) Joystick control.

4.1.8 Other Functions

1) Operating System

2) Configurable Windows interface

3) Networking

4) Detailed logging

5) Switching between different languages

6) Automatic mode switching

4.2 Operator Interface

The operation interface is designed based on the Windows technology standard and is operated by a mouse in principle. The operation interface of the cutting machine software is shown in Figure 4-1.

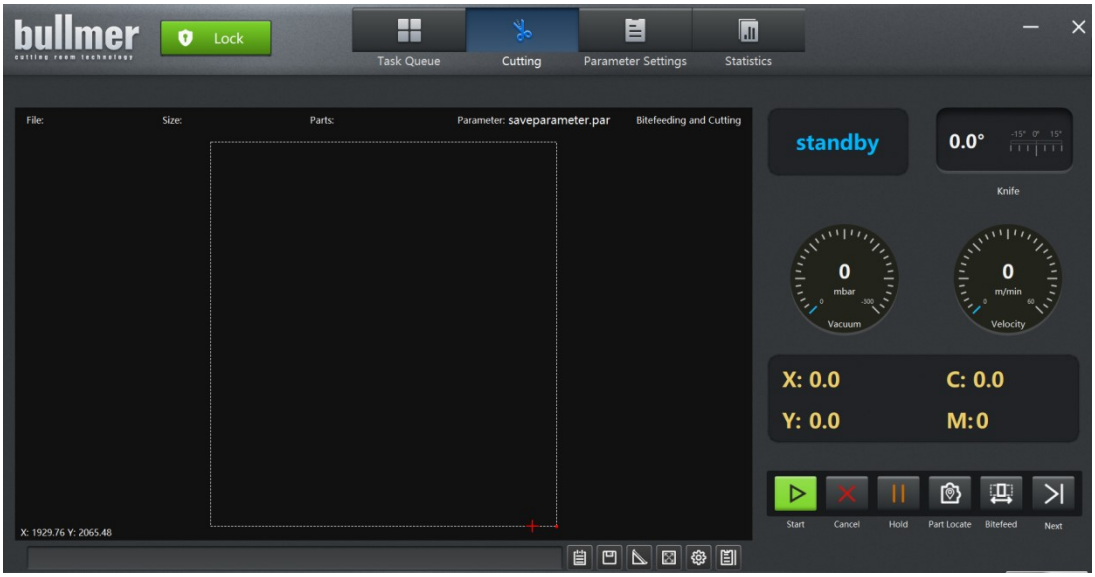


Figure 4-1 Cutting machine software operation interface

4.2.1 Information Display Window

1） Software Information Window

The software information window is located in the upper right corner of the screen and displays the basic information of the software, including the current cut CAD file, size, number of cut pieces, parameters, window mode, and progress. The software information window is shown in Figure 4-2.

Figure 4-2 Software Information Window

2） Position Coordinates Window

The Position Coordinates window displays the current position coordinates of the X-axis, Y-axis, C-axis, and Z-axis.

The Position Coordinates window is shown in Figure 4-3.

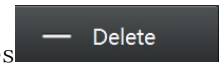
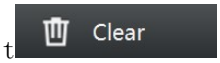
Figure 4-3 Position Coordinates Window

3） Status Message Window

The Status Information window is located in the upper left corner of the screen and displays important information about the machine. The current operating status of the machine is displayed in this window, including the current cutting speed, the maximum knife frequency, the bed vacuum negative pressure value, and the knife intelligent correction angle. You can use these to understand the current status of the machine during use, the status information window is shown in Figure 4-4.

Figure 4-4 Status Information Window

4) Work Queue Window

In the Cutting Job Queue Window, all rows selected for cutting markers are listed. CAD files can be added using the button "  ", unwanted CAD files can be deleted using the button "Delete files  " and the work list can be emptied using the button "Empty list  ", at this time All files in the worklist are deleted. The Work Queue Window is shown in Figure 4-5.

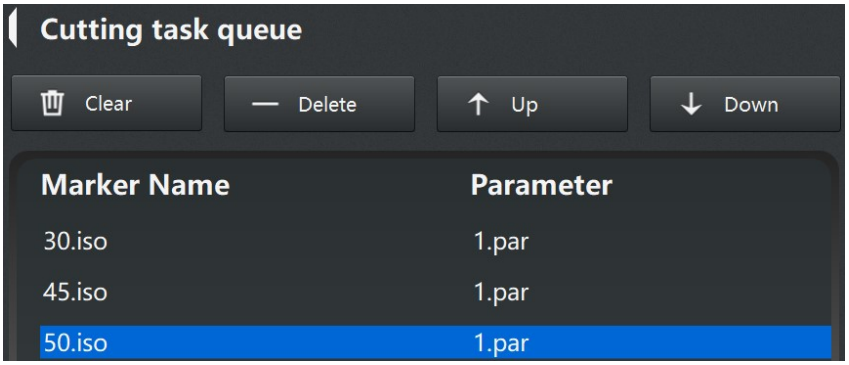


Figure 4-5 Work Queue Window

5) Operation Bar Window

The operation bar is located at the bottom of the main interface of the software, below the file display area. The operation bar is divided into 12 function buttons, which represent different meanings,  and two buttons represent the "previous page" and "next page" operations respectively.

The functions of each function button are described in detail below. The

operation bar is shown in Figure 4-6.

Figure 4-6 Operation Bar Window

Key Name	Functionality
Start	Click this button to start cutting.
Cancel	Stop the action.
Hold	Pause to hold the action.
PartLocate	Position cuts by corners for uncut pieces.
Bitefeed	They are used for over-window switching.
Dryrun	Activate the empty-cutting function.
Part Recut	Recut the selected cutout.
Back	Go back to the start point and re-crop the current window
Position	Positioning of X/Y/C/Z axes
TC Stop	Controls the automatic Bitefeed receiving table pause.
Log	Machine logs can be viewed.
Save Parts	Save selected cuts
Measure	Measurement of point-to-point dimensions within CAD.
Overall picture Preview	Open the global preview of the CAD layout
Display Settings	CAD layout information display settings
All Param	Perform all parameter-setting operations

6） Log Window

The system provides a powerful information system. At any time, information about the operation of the cutting machine can be seen. The last information is displayed continuously in the information window if you want to check the previous information you can scroll up the toolbar.

The list of messages is also named Log. In the log file, all messages and actions are recorded in real-time. Messages and records received by the system (function key confirmations, etc.) are also displayed in the Log window. Messages include icons, time, and message content. The Message Log window is shown in Figure 4-7.

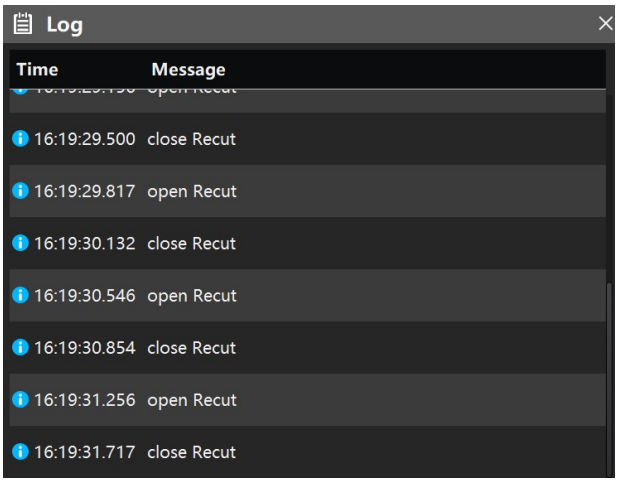


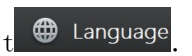
Figure 4-7 Log Window

In some error checking or machine maintenance, if there is more information in the information window, to prevent the current information from interfering, right-click on the "mouse" before operation, and select Clear Information, you can clear the existing information in the current window.

It is also possible to check all the details by selecting Edit.

4.2.2 Parameter Setting Window

The Quick Setup Window is used to set the common parameters of the cutting machine. The Quick Setup window is shown in Figure 4-9.

You can switch between languages in the language list 

. Currently,

we offer Simplified Chinese, English, Russian, Vietnamese, German, Arabic, Spanish, and Portuguese.

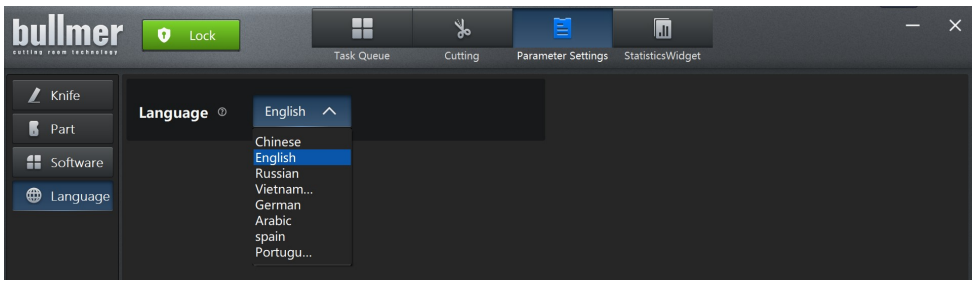


Figure 4-9 Quick Setup Window

4.2.3 Setting up the Window "⚙ "

For some special CAD files, you can set them through the Display Settings window to select the desired display format, such as displaying perforating, after selecting, the CAD file in the cutting area will display punched holes; otherwise, the punched holes will not be displayed. The Display Settings window includes display Outline, Inner line, Inner Paint lint, Text, Qual line, Qual zone, notch, Drill, Cutting Status Toggle, Hole Punch Outline, Paint Point, Start Point, Cutting Pieces Sequence, and Direction.

For complex CAD drawings with more lines, it is especially important to utilize this window for selective display. Set the window as shown in Figure 4-10.

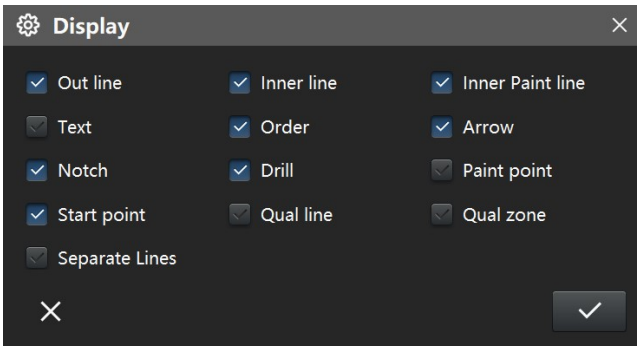
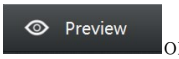


Figure 4-10 Display Settings Window

4.2.4 The Cutting File Queue Window

Here you can select the marker you want to cut to zoom by 

on the Cutting File Queue Window.

The Zoom Window is used to set the X and Y direction zoom ratio or zoom distance. After applying it the cutout will be scaled in an X or Y direction according to the set ratio. The Work Queue Window is shown in Figure 4-11.

Select the marker file that needs to be scaled and rotated, and click the Preview button to enter the marker editing interface, as shown in Figure 4-11 below, the scaling and rotating operation is finished click the "Preview"  button to preview the marker according to the transformation of the operation. Click the "Add" button  to add the marker to the cutting take queue. Click the "Reset" button  to revert to the original marker. Click the "Cancel" button  to exit the preview interface.

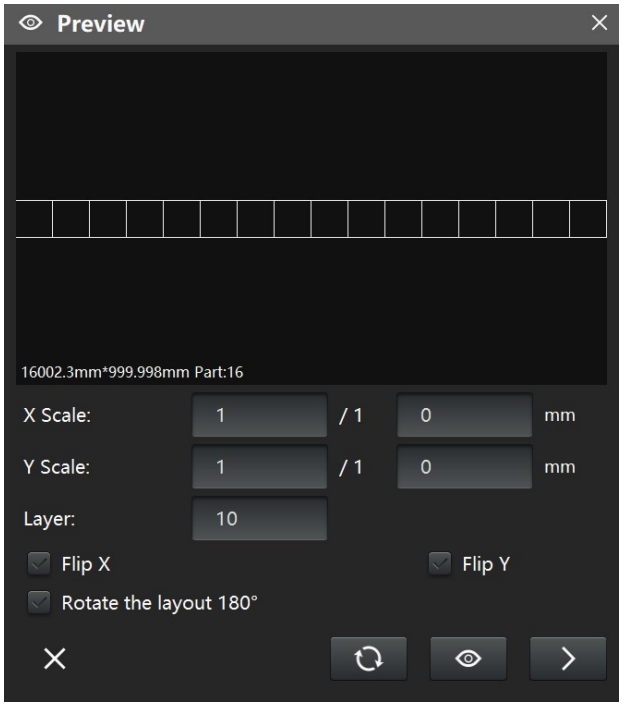


Figure 4-11Work Queue and Preview Interface

4.2.5 Statistical Information Window

The Statistical Information Window can automatically save reports for individual markers or current cutting markers in PDF format, as well as generate daily and monthly reports into an Excel sheet. The Statistical Information Window is shown in Figure 4-12.

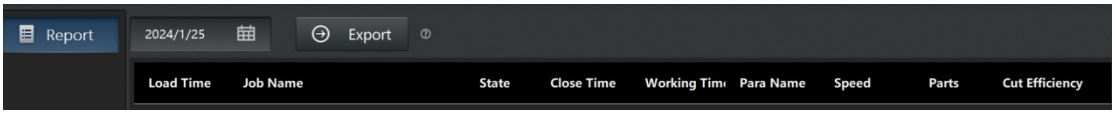


Figure 4-12 Statistical Information Window

4.2.6 Three-step Positioning Window

The three-step Positioning window allows you to locate the start point of the cutting head by X and Y coordinates. The three-step positioning window is shown in Figure 4-13.

Figure 4-13 Three-Step Positioning Window

4.2.7 PartLocate Window

After opening the PartLocate function  , double-click the cut pieces that are being cut or not cut within the cutting range, the outer outline of the cut piece turns yellow, click the Start button  to enter the PartLocate interface. As shown in Figure 4-14.

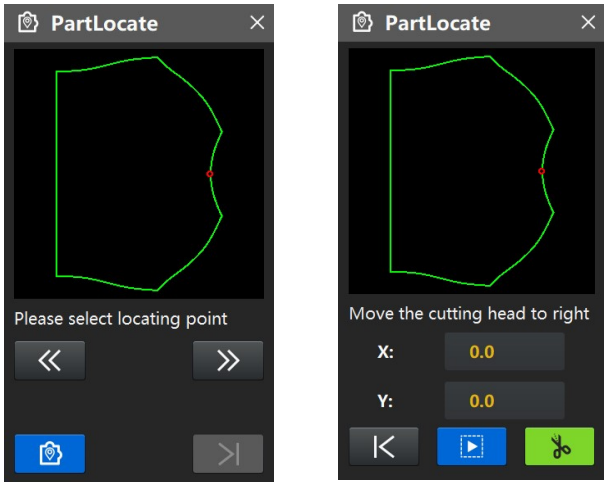


Figure 4-14 PartLocate Window

1) Displays the outline of the cut pieces.

2) Click the PartLocate button  to position the laser light to the selected positioning point.

3) Move the cutting head to the target positioning point via the control panel.

4)  Go to the next page and simulate the empty-cutting by previewing 

5) If the positioning is not accurate, go back to the previous page via  and repeat the above steps.

6) If the positioning is accurate, start cutting via  .

4.3 Launching Software

After starting the system software, the software is displayed as shown in Figure 4-14. The software is in a locked state after starting, if you want to operate the cutting machine, first turn on the power on the operation panel, and then unlock the software.

The steps are: turn on the power - and unlock the machine.

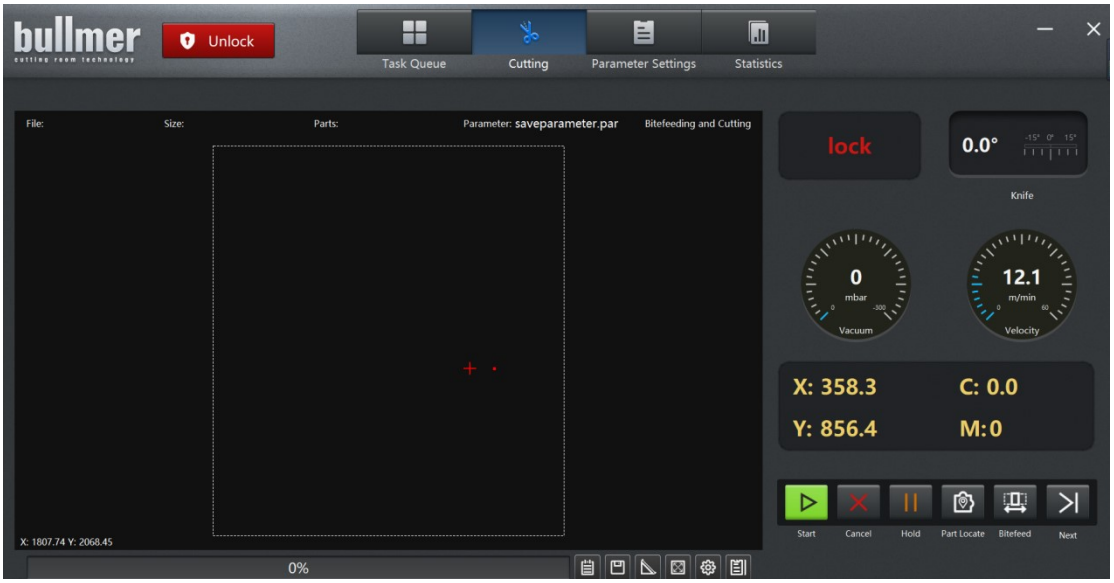


Figure 4-14 Cutting machine software interface

4.4 Starting a Row of Marker Processing

If you want to cut a new marker, you can add the CAD file to the work queue window through the Task Queue Window. The Edit Work Queue window is shown in Figure 4-15.

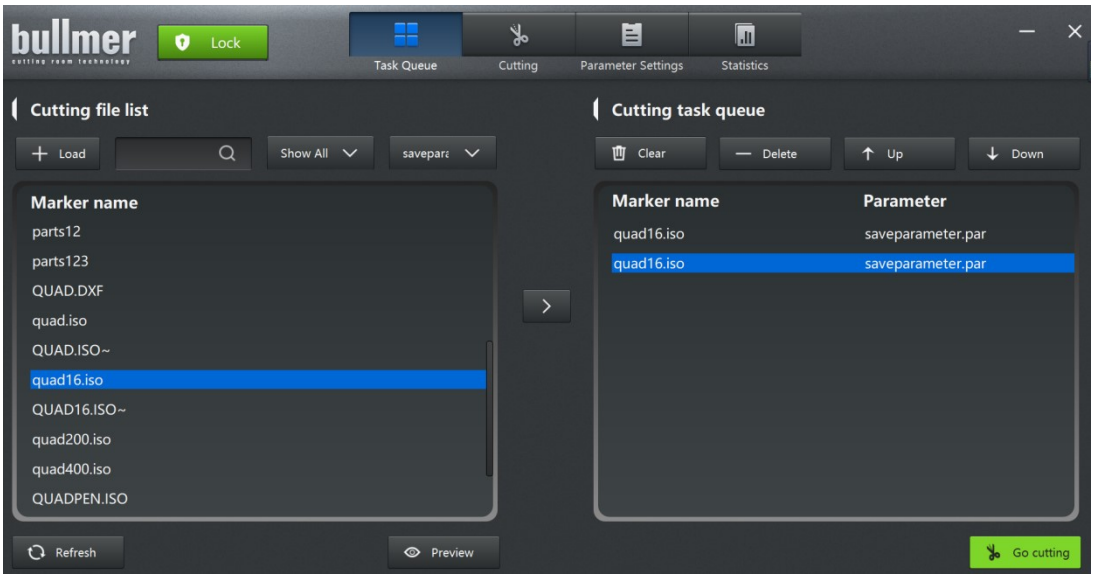


Figure 4-15 Edit Work Queue Window

In the "Edit File Queue Window", you can select the marker you need from the preview window, then select the "Add File" button to add the selected file to the work queue. In this window, you can also manually enter the number of layers and pieces, as well as zoom in and out of the marker.

4.5 Cutting Process

Start: if a new marker has been added. In standby mode, the manual mode can be accessed using the icon "Start" button, the "Confirm" and "Interrupt" buttons flash alternately to remind the manual positioning. After manual positioning, the markers will be cut in the order in which they have been arranged.

Hold: Cutting can be stopped with the "Hold" button. Since the machine is still in the current cutting process and active, no other more in-depth functions can be performed.

Cancel: If you want to cancel the cutting task during the cropping process, click this button.

1) Cutting Operation with Bitefeed

If the marker is longer than the working area of the cutting machine, that will be cutting with bitefeed. If you determine the start point of the marker, the system compares the working area of the cutting machine with the size of the marker and independently calculates which cut pieces are within the working area to be cut immediately. When these pieces are cut, the machine's bristle tile conveyor table automatically passes through the window for the next window of cutting.

2) Cutting Process with Bitefeeding

When bitefeeding and cutting, the cutting distance reaches the automatic bitefeed length, when a cutting window is completed the vacuum will be automatically lowered and the bristle brick conveyor belt will be transferred.

The bristle brick conveyor belt and the receiving table conveyor belt will move synchronously in the direction of fabric conveying, and the cutting action will not stop. During the cutting process, pay attention to the inclination of the fabric and correct it in time so as not to cut outside the area.

4.6 Ending the Software

You can end the program by clicking the close button (in the upper right corner of the main program). If you are in the middle of a cutting process, you must click on "Cancel" to interrupt the cutting task before exiting the system, and the program will end when the operation is complete.

V. Further Functions

5.1 Stop/continue Cutting

5.1.1 General

Normally (if no other function is selected by the operator) the cutting process will be displayed on the monitor. To interrupt the cutting program, there are several methods:

1) Pause the Cutting Program at the Machine Control Panel.

Simply press "Stop" on the control panel.

2) Interruptions by the Mouse of the Cutting Machine Computer

On the first toolbar, find the function "Stop" button and click on the corresponding icon with the mouse to stop the cutting program.

After stopping a cutting program, it is possible to continue it. It can be restarted by clicking on the corresponding icon with the mouse.

After stopping a cutting program, you have to make a break in cutting by restarting it on the control panel or by starting the cut on the toolbar.

3) Stopping by the Emergency Stop Button or Safety Device

Each cutting machine is equipped with an emergency stop button and corresponding safety device, On some special occasions, such as machine malfunction, misuse cutting error, etc., then you can quickly stop the machine through the emergency stop switch or safety device to prevent accidents.

5.1.2 Continuing to Cut After an Emergency Stop

If it is an emergency stop of the cutting program, the machine must be turned back on and initialized before you can continue. Since the cutting program is interrupted in a different way (cutting process or windowing process), a different

approach is required for the machine to continue working.

1) Cutting Stops During Bitefeeding and Cutting in a Non-bitefeed State

Click the button  or click the Restart  button on the control panel to start cutting.

2) Trigger Emergency During Bitefeeding and Cutting in a Non-bitefeed State

1. Restoration of the emergency stop button
2. Press the power start button (operator panel)
3. Unlocking
4. Turn on the vacuum
5. Start cutting

1) Cutting Stops During Bitefeeding and Cutting in a Bitefeed State

1. Open the "PartLocate" function and double-click to select the cutting piece
2. Click the Start button
3. In the pop-up window, position the cut piece
4. Simulation of empty cuts through "Preview", pending the end of the simulation
5. Click the "Start" button to begin cutting

4) Emergency Triggered During Bitefeeding and Cutting in a Bitefeed State

1. Restore the emergency stop button
2. Press the power start button (operator panel)
3. Unlocking

4. Turn on the vacuum

5. Open the "PartLocate" function and double-click to select the cutting piece.

6. Click on the Start button

7. In the pop-up window, position the cut piece

5.2 Graphic Functions

This graphic provides you with many features to help you view the details of the loaded function. If a marker is loaded, the system automatically displays the graphic in the window. When you open the cutter software, the default display is shown in Figure 5-1.

Figure 5-1 Default Display Interface

The following actions can now be performed in the graph:

Zoom in/out

Mouse on the specified graphics, scroll the mouse wheel to zoom in or out of the graphics, or hold down the left mouse button, to intercept the part to be enlarged, you can enlarge the graphics. This can better observe the detailed parts of the CAD drawing, you can click and press the mouse wheel to move the drawing left and right. If you want to reset the modified drawing, you can click the right mouse button and

the drawing will change to the default size when loaded.

5.3 Parameterization

5.3.1 General

You can change, store, and load parameters through the information setting page. A variety of parameters are set only for the execution of a particular machine and for the needs of optional equipment. Therefore, the parameter list needs to be adjusted according to the machine in each case.

If you are already familiar with the relevant parameters of the cutting machine, you can directly find the parameters you need according to the good classification in the parameter classification window, and then click on the corresponding classification, the parameters of the same category will be displayed in the list window, then select the parameters you need to modify.

For each parameter, the system has set a range of values that cannot be crossed. If the value range exceeds the predetermined limit, the value cannot be entered and the error message "Setting value is outside the parameter settable range, please check: (Illegal parameter)" appears.

5.3.2 Parameter setting

The parameter window is shown in Figure 5-2, which realizes the functions of classifying, displaying, modifying, and saving the parameters of the cutting machine.

Parameter classification: According to the parameter group to which the parameter belongs, the staff familiar with the parameters of the cutting machine can quickly find the corresponding parameter and carry out the operation of viewing and modifying. For example, if you need to modify "Vacuum Pressure", you can choose

Software Function->Vacuum Pressure.

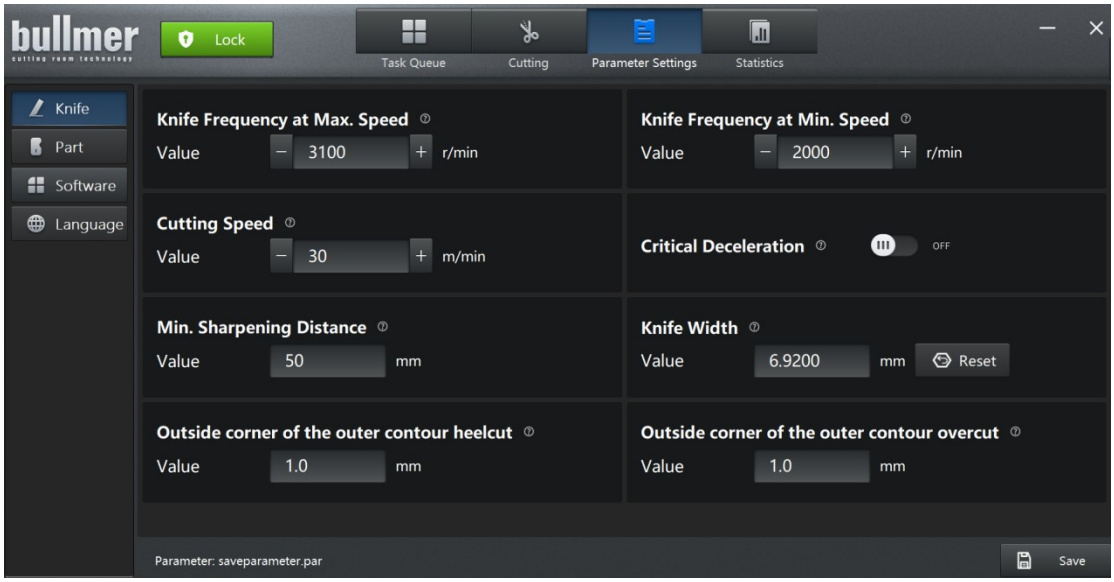


Figure 5-2 Parameter Window

Modify parameters: first, you can find the parameters you need to modify through the parameter classification, modify the corresponding parameters, modify the completion of the "Save" button, and click the "Save AS" button to save to the current call parameters.

VI. Interface Parameters

Parameters are divided into different categories according to their content, and users can click on the parameter type on the left to quickly locate the parameter they are looking for.

The following is a description of each of the user parameters by parameter type

6.1 All Parameters

Parameters are divided into all parameters  and parameter settings 

6.2 Parameter Saving

Engineers can save different parameter lists according to the customer's actual cutting fabric technology, where the serial number color is yellow marking can be customized according to the different technology parameters, the serial number is white is the general basic parameters; user parameters can be changed in all modes, the other parameters can only be changed in the standby and lock state.

6.3 Interface Parameters

Cutter Knife

Speed:

Maximum Knife Frequency [r/min]

This parameter indicates the knife drive frequency that corresponds to the maximum cutting speed when performing inverter cutting.

Minimum Knife Frequency for Cutting [r/min]

This parameter indicates the knife drive frequency that corresponds to the

execution of the minimum cutting speed in inverter cutting.

Max. Cutting Speed [m/min]

This parameter sets the maximum speed value of the cutting marker in [m/min]. The maximum value that can be set for this parameter is itself limited by the maximum speed of the machine parameter. The setting of the cutting speed depends mainly on factors such as the characteristics of the fabric and its height.

Critical Downturn

The critical speed reduction function switch reduces the cutting speed when the distance to the cut line segment is less than the critical deceleration distance.

Minimum Sharpening Distance [mm]

This parameter defines a sharpening action when the cut length reaches a certain distance and the knife is lifted.

Knife Width [mm]

The width between the knife front and knife back. Click the Reset button to return to the default initial knife width.

Outside Corner of the Outer Contour Heelcut [mm]

Extra cutting length of outline at plunging knife place.

Outside Corner of the Outer Contour Overcut [mm]

Extra cutting length of outline at lifting knife place.

Cut pieces:

Corner Lift Angle [°]

When the complementary angle of a corner is larger than the value of this parameter, the knife will be lifted to cut it.

Outer contour inside angle of tool lift [°]

The inner corner of the outer contour is cut using a lifting cutter when the complementary angle of the corner pinch point is greater than the value of this parameter.

Speed-limit at Max. Radius Rate [m/min]

In the curve speed calculation, the radius of curvature of each section of the curve is divided into different speeds; when the radius of curvature is equal

to the maximum radius of the curve identification use this speed cut.

Speed-limit at Min. Radius Rate [m/min]

In the curve speed calculation, the radius of curvature of each section of the curve is divided into different speeds; when the radius of curvature is equal to the minimum radius of the curve identification use this speed cut.

Depth of I-Notch [mm]

Depth of cutting I-Notch

Depth of V-Notch [mm]

Depth of cutting V-Notch

Software Features:

Vacuum Pressure at Bitefeed [-]

This parameter defines the input scale of the vacuum pump's analog quantity in bitefeed.

Vacuum [-]

This parameter defines the input scale of the vacuum pump's analog quantity in the manual mode.

Language:

The language can be switched as required.

VII. Other Functions

7.1 Safe Mode

Locked mode to Safe Mode.

7.2 Back to the Locating Point

During normal cutting in the current window, first click the Stop button  to stop running, then click the Back to Positioning Point button  , the cutting

head will automatically return to the starting point of the three-step positioning. Then click the Start button to start cutting, the system needs to re-position the cutting point and start cutting from the first piece of the current window. The Back to Positioning Point button is shown in Figure 7-1.

Figure 7-1 Return to Position Point Button Window

7.3 Selection and Saving

Press and hold the Ctrl key, and with the left mouse button, you can box and click to select the cutting piece to be saved. After selecting the piece that needs to be saved, you can release the ctrl key and click the operation of the block selection save button to save it. The mouse selection function is shown in Figure 7-2.

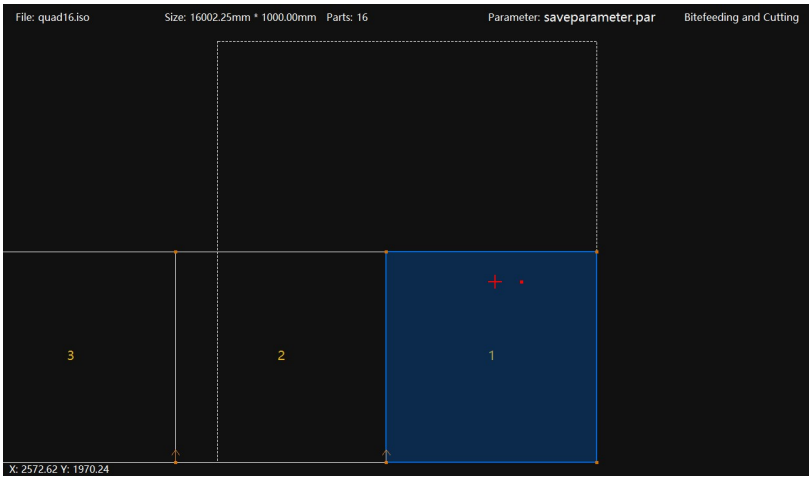


Figure 7- 2 Mouse Selection Window

7.4 Selection of Films Without Cutting

In standby mode or during cutting, double-clicking on a non-cutting piece by holding down the "Alt" key plus the left mouse button, will not be cutting.

7.5 Selection and Recut Function.

To turn on the  selection recut function, click a cut piece within the cutting area to reset its status.

7.6 Priority Cutting

In standby mode, hold down the "Shift" key and click the cut piece to be cut to realize the selected cut piece to stop after cutting. (Mainly to cope with the tilting of material in bitefeeding and cutting)

7.7 Marker Preview Function

After loading the marker, click  to preview it, in Figure 7-3.

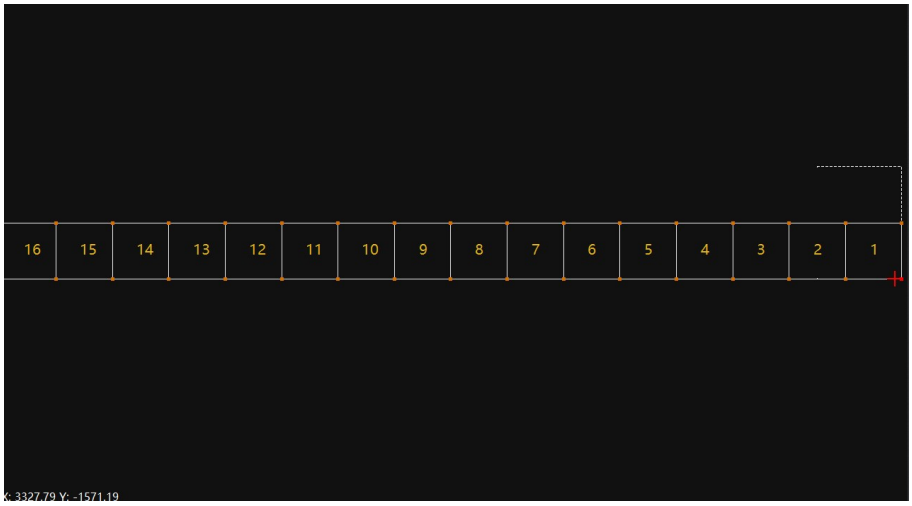


Figure 7-3 Layout Preview Function

7.8 Measurement Functions

After loading the marker, click  to open the measurement function. After you

open this function, you can find the position you want to measure in the marker, double-click the left button of the mouse after you find it, confirm the measurement start point and the measurement endpoint, and then get a triangle, XYL corresponds to the difference value of the two points in the X-direction, the Y-direction, and the direct distance, as shown in Figure 7-4.

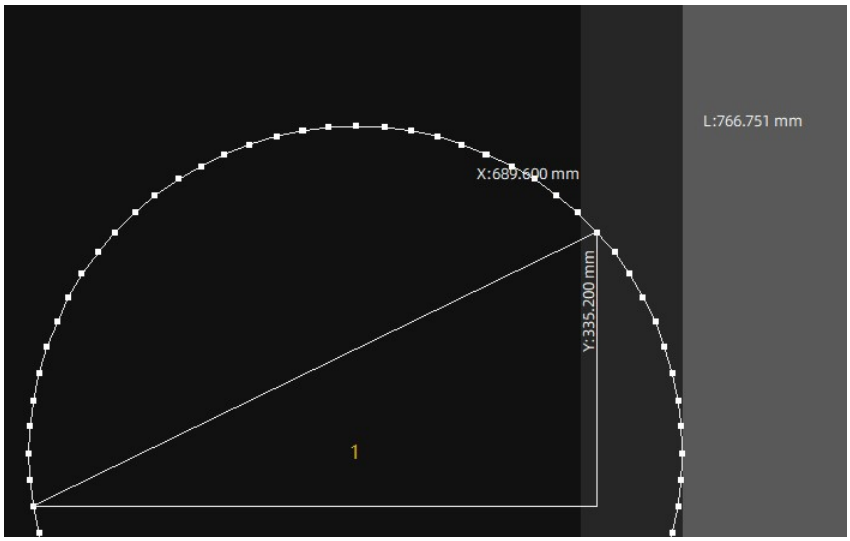


Figure 7-4 Measurement Functions

VIII. Maintenance and Technical Data

8.1 Service Functions

8.1.1 Machine Position

If you select the function, click on the button  to open the positioning window where you can enter the values for the X-axis, Y-axis, C-axis, and Z-axis (bristle bed). Select the "Start" button and the machine positioning is completed. The machine positioning window is shown in Figure 8-1.

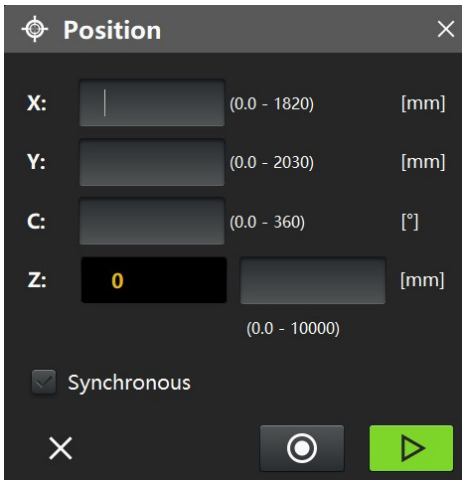


Figure 8-1 Machine Position Window

This function is only available in standby mode.

X- and Y-axis: With the help of this function, it is possible to position the machine in absolute coordinates according to its origin coordinates. Enter the desired positioning values and confirm with "Start". If the values provided are within the permissible range, the positioning is successful.

C-axis: The C-axis can be positioned by entering the desired angle value and confirming with "Start", that the C-axis will be turned to the desired position.

Z-axis: You can input the desired length to move the Z-axis and confirm with "Start" to move the Z-axis to the set position.

Synchronize: After checking the box, clicking the "Start" button will synchronize bitefeed.

8.1.2 The Markers of Adjust Machine

In a separate table, you can find some markers, mainly used for testing and tuning purposes. Depending on the functionality to be tested choose the test files that are not available and check if the corresponding functionality is intact. If the path of the file does not change with the installation, the table of functional test files is shown in the following table.

C:\cutter, these test files are used to test and adjust the machine parameters,

as well as being cut under a vacuum with paper underneath and film covering the top layer.

Marker name	Application Purpose
QUAD200.ISO	This area with an edge length of 200 mm can be used to check the offset of the knife tool (x- and y-distance to the laser point) The initial point is near the laser point, whose marking must be made on the plastic film before cutting can take place. Since there is only one area of the nesting, the initial point of the nesting chart should thus be aligned with the corresponding edge of this area. (The lower left edge of the area is executed on the left, and the lower right corner of the cutter is executed on the right). You can calibrate after cutting to see if the edges of the area (cut contour) are correctly at the laser point position. If this is not the case, you have to correct the corresponding parameter values for "Knife X-axis offset" and "Knife Y-axis offset".
QUAD400.ISO	This area with an edge length of 400 millimeters can be used to check the accuracy of the x- and y-axes. The edge length of this area - from the paper cut - must be exactly 400 mm. If there is an offset in length or width, the corresponding parameters "x-axis resolution " and "y-axis resolution " must be corrected.
KREUZ43.ISO	Check the drilling offset of the drill (M43). The hole must be drilled exactly at the intersection of the cutting line with the correct compensation of the tool "Drill 1 X-direction offset" and "Drill 1 Y-direction offset".
KREUZ44.ISO	If there is a second drill, it is used to check the drilling offset of the auxiliary drill (M44). With the correct compensation of the tool with the parameters "Drill 2 X-direction offset" and "Drill 2 Y-direction offset", the hole must be drilled exactly at the intersection of the cutting lines.
CTEST.ISO	Used to adjust the C-axis. Cut two circumferences and two rectangles at a time in the clockwise direction and once in the counterclockwise direction. If the two circumferences are not the same size, the insertion point is not on the mechanical pivot point

	of the knife drive (knife guide).
QUAD16.ISO	A 16-meter-long row of material was generated from an area with an edge length of always 1 meter and was used to test bitefeeding and cutting.

8.1.3 Tool-path Testing

Respectively in 0 ° / 90 ° / 180 ° / 270 ° position under the knife and up the knife, can be used to test if the knife track is normal, if you want to carry out the knife track test, it is recommended in the corresponding bristle bed position on the thick double-sided adhesive tape, and then use the laser lamp to align the center of the double-sided adhesive tape to the final test.

If the deviation is too large please contact the service for physical adjustment of the tool-path!

8.2 Hazard List

sequences	Hazard Type	cure	Precision to standard
1	Danger when moving the cutting beam	Pay attention to the operating instructions Watch out next to the machine. Safety block (stop in case of emergency)	EN 292 VBG

2	When the knife is cutting	Pay attention to the operating instructions Watch out next to the machine.	EN 292 VBG
3	When depressing the holder or moving parts	Pay attention to the operating instructions Watch out next to the machine.	EN 292 VBG
4	Working on a machine without turning it off or turning it on unconsciously	Pay attention to the operating instructions Watch out next to the machine.	EN 292 VBG
5	Squeezing the conveyor belt while transferring or moving the machine (mobile cutting machine)	Pay attention to the operating instructions Watch out next to the machine.	EN 292 VBG

8.3 Technical data

Working width		1800mm
Working length		1800mm
Maximum Cutting Height		Depending on the material 1 layer - 80mm (under vacuum)
Maximum positioning speed		Depending on the situation Maximum 100m/min
Maximum cutting speed		Depending on the situation Maximum 100m/min
bristle brick		Depending on the actual

		situation
maximum acceleration		Depending on the situation Maximum 1.5 g (g = 9.81 m/s2)
data format		ISO format GBR standard format
data transmission	offline (computing)	hard disk
	on-line	Network (Internet or other)
Access Voltage		400V/50Hz Special voltages on request
energy consumption	Vacuum equipment	Depending on the situation
	cutter	Depending on configuration
Pressure vacuum consumption during cutting		200 I/min at 6 atmospheres
environmental impact		The control panel voltage must be stabilized (maximum tolerance +/-5%) The environment (actual humidity and temperature) should be suitable for the fabric being processed (air conditions)

8.4 Frequently Asked Questions

8.4.1 Cutting Machine Software Issues

1) What if the software system crashes during use?

A: In the process of using the cutting machine, sometimes it will encounter interference, abnormal operation, or some other special circumstances, which will cause the software to crash. If you are in the process of cutting, please disconnect the power supply with the emergency stop switch or safety switch first, then close the software and reopen it.

2) What if I click on a CAD file in the work queue but it won't open?

A: At present, some larger CAD files are slower to load, please wait patiently for a while. If you still can't open it for a long time, please check whether the CAD file is in cuttable format first. To confirm that the above methods can not open the CAD file, please contact our technical staff or send the CAD file and the problem description to our after-sales mailbox, we will give you a solution as soon as possible.

8.4.2 Problems with Industrial Computer Controllers

1) What if the software does not operate and the driver is flashing?

A drive flicker is generated because the industrial computer control and drive communication disconnected, you should first check the drive communication cable and power cable connection is normal. If the cable is loose, just plug the cable firmly, otherwise, turn off the CNC controller, restart, and establish the connection again.

8.4.3 Operational Process Issues

1) Control panel power start button (green button) won't open.

A: Check that the emergency stop switches have all been reset.

2) Cutting machine software won't unlock when I open it.

A: Check the status of each module and signal output.

8.5 Contacts

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Corporate e-mail: info@topcut-bullmer.cc

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