Manual For E80
Bummer Cutter

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CHAPTER I

General note

1.1 Observe notes in the instruction manual

Basic prerequisite for the proper use and the problem-free operation of this machine, is the
knowledge of the instruction manual with the danger- and safety hints contained therein.

This instruction manual contains the most important notes in order to operate the machine securely.

This instruction manual, especially the safety notes,
is to be observed by all persons, who operate the machine
In addition, the rules and regulations for prevention of accidents, that are in force at the place of operation, are to be observed.

In the instruction manual, additional signs are used with
the following meaning:

Marking of danger points

This symbol means a direct threatening danger for
the life and the health of persons.
The failure to observe these notes can lead to heavy ,all the way to life threatening injuries to life and health.

Important information and notes

This symbol gives important hints for the proper contact with the machine.
The failure to observe these hints can lead to faults at the machine or in the surroundings.

1.2 Obligations of the operator

The operator obligates himself to have only persons work on the machine, who:
· are familiar with the basic rules regarding work-safety and accident-prevention and who are trained regarding the handling and operating of the machine.

· have read the safety-chapter and the warning-hints in this instruction manual, understood them and have confirmed this with his/her/their signature.

The safety-conscious work of the personnel is checked in regular intervals by the securityrepresentative
of the operator

1.3 Obligations of the personnel

All persons, who are engaged with working at the machine, obligate themselves, before start:
· to observe the basic rules regarding work-safety and accident-prevention.
· to read the safety-chapter and the warning - and danger notes in this instruction manual and to confirm this by his/her/their signature.
They have to confirm through their signature that they have understood the safety chapter and the
warning and danger notes.

1.4 Dangers when operating the machine

The machine is built in accordance to the stand of the technology and the safety-rules. Nevertheless, dangers can occur by its use for health and the life of the operators or third persons and/or damages can develop on the machine or on other objects or devices.

The machine is only to be used:

- for its intended use
- in safety-related perfect condition.

Disturbances of any type, which can impair the safety of the machine are to be corrected immediately !

1.5 Appropriate use

The machine is designed only to be used in accordance to the chapter "Use of the machine “Use
deviating from or overreaching the intended purpose of the machine is inappropriate.
Topcut-bullmer GmbH cannot be held liable for damages occuring from such use.
Also included under the heading appropriate use are:
· the observance of all notes in the instructions
· the upholding of the inspection and maintenance work

1.6 Warranty and Liability

Our " general terms of sale and delivery “ are fundamentally valid.

These will be made available to the user upon closing of the contract at the latest.
Warranty and liability claims are not possible for personal injury or damage to property if the damage is due to one or more of the following reasons.:

- Inappropriate use of the machine
- Incorrect mounting, operating, controlling or maintenance of the machine
- Mounting or maintenance work being carried out by unauthorized personnel
- Operation of the machine with defective safety devices or safety devices which are not mounted properly or which do not function perfectly.
- Non observance of the notes in the instructions with regard to transport, storage, mounting, initial operation, operation, maintenance and preparation of the machine
- unauthorized structural changes made to the machine, as well as on the machines adjoining
- Installing or exchanging parts of the machine using non-original components
- Inadequate monitoring of machine parts which are subject to wear
- repairs carried out incorrectly
- disasters caused by foreign bodies or reasons of higher force.

1.7 Safety regulations

1.7.1 Organizational measures

- The required personal protection devices are to be made available by the operator
- All existing safety devices are to be checked regularly

1.7.2 Safety Devices

- Before every use of the machine, all safety devices must be installed correctly and must be functional

- The machine will not run without plans after being stopped.
- When delivering part components, the safety devices are to be installed by the operator according to regulations
- After structural changes at the machine or or on adjoining devices, the safety devices must be installed to the changed machines or components and be checked by the responsible safety representative.

1.7.3 Informal safety measures

- The instructions for use are to be kept at the workplace of the machine at all times.
- In addition to the instructions for use, the generally valid safety rules as well as the local regulations for accident prevention and for environmental protection are to be available and observed at all times.
- All notes on safety and danger signs on the machine itself are to be kept in a legible condition.

- Only trained and assigned personnel can work on the machine.
- The responsibilities of the personnel are to be clearly determined for the mounting initial operation, operation, preparation, maintenance and repair of the machine.
- Personnel to be trained may only work on the machine under the supervision of an experienced and trained person.

1.7.4 Machine Controls

- Under no circumstances may program modifications be made on the software.
- Only appropriately trained personnel is allowed to operate the control

1.7.5 Safety Measures for normal use

- Only operate the machine when all safety devices are fully functional
- Before switching on the machine, it must be assured, that nobody can be injured by the starting of the machine.
- At least once per shift the machine is to be inspected for superficial signs of damage and for the correct functioning of the safety devices.

1.7.6 Dangers through electric energy

- Working at the electric supply is only allowed for specialists, under observance of the valid safety regulations according to DIN/VDE and EN.

- The electric equipment of the machine is to be checked regularly.
- Access is only allowed for authorized personnel with key or tool.
- Loose connections , damaged wires and cables and lines or other safety relevant damages are to be removed immediately.
- The electrical control cabinet and the clamping boxes are to be kept closed.
- On necessary work on parts that give out electrical voltage, the valid safety regulations are to be adhered to according to DIN/VDE and EN.

1.7.7 Dangers through pneumatic energy

- Only personnel with specialized knowledge and experience in the field of pneumatic may work on the pneumatic appliances.
- Sections of the system and pressure pipes which are to be opened are to be rendered free of pressure before working on them.

- Pneumatic hoses are to be replaced at appropriate intervals , even if not showing any signs of safety relevant deficiencies.

1.7.8 Special points of danger

- A list of the dangers is included in Chapter 8.2.

1.7.9 Storage - transportation - and operating conditions

STORAGE - AND TRANSPORTATION-CONDITIONS:
Temperature: -25° to +55° Celsius
Relative humidity: less than 80 percent (doesn't condense)

OPERATING CONDITIONS:
Temperature: +5° to +40° Celsius
Relative humidity: 10 percent (doesn't condense) until 80 percent
Installation altitude: less than 1000 m absolute altitude
Connection values: 400V 50Hz (3 Phase/ 5 wires) (max. tolerance +/- 10 %).
Wires for power input: the power input wires for each control cabinet box must connected to the fixed terminal in the cabinet box by using waterproof joints.
Protections for power supply: the main power line must connect to the device by using the voltage regulators (equipped according to the actual needs of the customers).
Personal protection: there are no mandatory demands for personal protection objects, operators can equip according to personal demands.

1.8 Maintenance and Servicing / Trouble shooting

- Required adjustment maintenance and inspection work is to be carried out regularly.
- The operating personnel is to be informed before maintenance and inspection is done.
- All components in front of or behind the machine and operating media such as compressed air and hydraulics are to be secured against unauthorized use.
- On all maintenance, inspection and repair work done, the machine is to be switched to voltage-free and the main switch is to be secured against being switched back on unintentionally.

- **Turn off main switch and pull key if necessary**
- **Place lock and warning sign to stop the machine being switched on again**

- Larger component groups are to be securely affixed to cranes or platforms when being replaced.
- After finishing the maintenance work, the function of the safety devices has to be checked

CHAPTER II

Introduction and summary

2.1 Valid application

This machine is only to be used in a valid application, which is to cut contours from a single or multiple ply fabric lays, primarily textiles.
The number and height of the fabric lays depends upon the machine configuration and the type of the fabrics used, among other things.
The machine is exclusively limited to applications described in this instruction. Other use is invalid.
The company Bullmer GmbH is not liable for consequential damages.

Valid applications includes the following

- **Observance of all instructions from the operation manual**
- **Observance of all inspection and maintenance requirements**

2.2 Introduction

This program is for the operation of a bullmer cutter. It enables this automatic cutting machine to be operated comfortably and simply in a wide range of applications and requirements.In addition to the basic functions such as loading markers, starting and cutting, etc., it also offers the possibility to set parameters in real time, to reallocate notches and cuts, to parameterize and to determine a desired set point after an interruption to recontinue cutting.
The system offers the user a succinct and easy-to-use working environment that also enables inexperienced computer users to learn what is required very quickly. This

handbook is designed to help you get accustomed to using the system and to serve as a troubleshooter when working with the machine in the future.
The beginner should test the functions on the system itself, preferably while reading these instructions; this is made simple for the user because pictures of the corresponding screen in the handbook accompany all operating steps.
This introduction is followed by a description of the system. In the last chapter you will find a list of the functions that are of interest for servicing as well as pages with instructions on cutting.
We are always grateful to receive tips and ideas from you

2.3 System description

2.3.1 Hardware - prerequisites

A computer control type CNC is necessary for the operation of the system.
We assume that a VGA-card and a high-resolution color screen are available.
So that large files with a large number of points can be processed, at least 1 GB RAM and 2GHz processor must be available.

2.3.2 Software - prerequisites

As an operating system, Windows 7 or Windows XP is required.
If markers are to be administered via the hard disk of the cutter control we recommend going over the hard disk regularly with a de-fragmentation program. This ensures high speed of data access.

2.3.3 Total view

The total view of the cutter is shown as the graph 2-1

Picture 2-1 Cutter Type E80

2.3.4 Cutter Control Panel

The cutter control panel is shown as the graph 2-2, the cutter can be operated manually by using this control panel.

Graph 2-2 The Cutter Control Panel

Note:

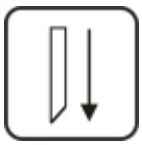
According to machine-execution and optional equipment the individual operation elements and their order can vary. The use of the machine is only possible if the main switch and control is switched on and the machine is unlocked. The key functions are, with individual exceptions, only feasible in the manual operation mode.

Key	Function Description

Emergency stop：Hit this button in an emergency situation. It stops all movements of the machine.

Control on:
The machine can be used only with control switched on and "unlocked".
Power the servo system.

Control off:
With this button, the control is switched off. Turn off the servo system.

With this  button, the knife-drive is plunged as well as lifted (manual operation).

Knife down:

Lateral cut:
With this button, the lateral cut is operated (under the standby mode).

Vacuum On/Off:
With this button, the vacuum is switched on/off.

Manual operation On/Off:
With this button, the operating mode is switched Manual/Automatic. The button lights up for manual operation.

Knife drive On/Off:
With this button, the knife drive is switched on/off
(under the standby mode)

Enter:
With this button, the single edge points will be confirmed during the reference sequence.

Restart:
A stopped cutting process can be restarted with this button.
Reference sequence: the reviewing of the edge points can be skipped; the cutter begins

to cut immediately

Presser foot down:
With this button the presser foot will be dropped as well as lifted (only with manual operation).

Abort: With this button, the reference sequence is broken off, the cutter returns to the start-point.

Stop:

Stop during cutting – continue with restart or new marker.

Advance conveyor:

With this button the conveyor can be moved forward.

Reverse conveyor: With this button the conveyor can be reversed.

Manual bitefeed:
Bristle band and transclear move simultaneously.

Cleaning of bristle conveyor:
To start a cleaning run press key “cleaning” first (to start the conveyor feed) and then switch on vacuum. During cleaning run the vacuum is used in the way to suck out the bristle conveyor. To avoid generating of vacuum during the cleaning run you absolutely have to pay attention that there is no cover foil on the table. Please pay also attention that cover foil is winded up in the way that it is not possible that it will be pulled on the table while cleaning run.

Joystick Controls Keys: Under the manual mode, press this key while shaking the joystick and then the cutting head can move. Press this key and the laser lamp will be on. The time in which the lamp is on can be set by software.

The light-pointer offers the possibility, in connection with the software (see chapter III, Software/Basis, reference sequence), to compare the total size of the loaded marker to be cut with the fabric lay. Additionally if a fabric lay is not lying straight, this can be corrected using the reference points checked with the light pointer. When these reference points are entered the marker is adjusted in the software to compensate for the lay not being straight on the cutting table.

CHAPTER III

OPERATION PROCESS

3.1 Process Introduction

The cutter is a complex cutting machine compared with other cutting tools, any

operation has the potential to cause a series hurt or accident, so the instructions should be followed rigidly when the machine is operated.

The operation processes for the cutter include safety check, preparation before operation, operation and so on, this section is going to introduce safety check and preparation before operation, the operation section will be introduced in the next chapter. Assume that the cutter has been assembled correctly.

Safety Check:

1) Check whether the connection of the external power supply is good. Check whether the voltage of the power supply is stable.
2) Check whether the outer air way is good and whether the leakage exists.
3) Check whether the cutting head of the cutter is good and whether the cutting tools are complete, including cut-off knives, pens, punches, oil feed, major drills, minor drills, laser lamps and so on.
4) Check whether the films are good.
5) Check whether the bristle band and the conveyor belt is good.
6) Check whether the vacuum is good.
7) Check whether there are obvious damages or abnormities. If there are damages and abnormities, repair or replace the components in time place.

Preparation before Operation

1) Make the environment near the cutter clean, in order to avoid operators slipping and being hurt
2) Check whether there are obstacles near the cutter and then hold up a sign to remind others not to come close.
3) Turn on the main external power supply, check whether it works well.
4) Turn on the power supply for the cutter and then check whether the cutting bed works well and whether the signal lamps work well.
5) Turn on the power supply for the controller, start CNC and check whether the controlling software and the cutting software have been installed.

If all the works above have been done without abnormities, the cutter then can be operated. In order to avoid accidents, simple test should be taken before the use. After ensure that the cutter works well, operation process will be taken, which will be introduced in detail.

3.2 Operation Process

The process of operating the cutter:

Firstly, turn on the external power supply and the gas ports; next, turn on the power

supply for the cutter and start the CNC controller; finally, find the icon of the cutter software  , double click(or right-click) to open the software.

After open the cutting software, the software is locked. Firstly the power switch  on the control panel must be turned on and then click the unlock button  , after finish these, the cutter can be operated then.

3.2.1 Function Test

The digital signal input/output window is the aggregation of all the actions and monitors whether all the functions of the cutter work well. So the test for the windows of the digital signal input/output is sufficiently important.

1) Control Panel Test

In the cutting process, the functions on the control panel are needed under the manual mode. In order to work well, the functions on the control panel need to be tested. The control panel test includes: cutter head up/down, cutter drive up/down, laterally cut, cutter drive vibrate, vacuum on/off, laser lamp, joysticks, stoning and so on.

2) Digital Signals input/output Test

Check whether the signal lamps for digital signals input/output work well. Check whether the tools on the cutting head work well, this window include all the functions on the control panel, the test is similar to the panel test and check whether the digital signal input/output window is correct.

3) Positioning Test

Click Positioning on the tools bar to take the positioning test. This function is used to test whether the connections between the software, drivers and the cutters are good or not.

3.2.2 Dry Run Test

Dry Run means no stoning, no oil feed, no covering films, no bit feed, but other functions are basically similar to the normal cutting. The main purpose for taking the Dry Run test is to check whether there are abnormities and confirm a cutting route on the cloth.

Assume all the works have been done before, the steps for Dry Run are shown below:

1) Press Dry Run on the tools bar, open Dry Run to take Dry Run test.
2) Confirm whether the icon  for showing functions on the top left corner displays well.
3) Click the Open File button  to enter in the interface for editing the working

lists.

4) Select CAD file, click Add Files  to add CAD files.

5) In the window of working list, select the CAD file which is going to be cut to display it in the cutting main window.
6) Select Start button  to enter in the manual mode.
7) Operate the joystick on the control panel then move it to a certain position.
8) Click the Enter button  on the control panel three times to start to Dry Run.

3.2.3 Cutting

Normal cut can be taken if all the tests are good according to the instructions and steps. Firstly use the bristle band to move the cloth to the appropriate position and then cover the cloth by films, finally start vacuums to compress it.

The steps for normal cut are shown below:

1) Click the Dry Run button on the tools bar to turn off the Dry Run function.
2) Confirm whether the icon  for showing functions on the top left corner displays well.
3) Click the Open File button  to enter in the interface for editing the working lists.
4) Select CAD file, click Add Files  to add CAD files.

5) In the window of working list, select the CAD file which is going to be cut to display it in the cutting main window.
6) Select Start button  to enter in the manual mode.
7) Operate the joystick on the control panel then move it to a certain position.
8) Click the Enter button  on the control panel three times to start to cut.

CHAPTER IV SYSTEM FUNCTIONS

The System can be used either by the control panel (button field at the cutter bridge) together with the ASCII-keyboard, as well as only by the keyboard. The operation by the control panel is limited by the most important functions. The handling of the system by keyboard is more comfortable.

4.1 Functional overview

4.1.1 Marker

- Handling of GERBER-ISO-Format
- Rotation, zoom and reflection of all parts or choose parts
- Automatic notch identification
- Optimising of the cutting sequence
- Recording of markers
-

4.1.2 Cutting

- Time optimized moving control with compliance of predetermined parameter such as speed, acceleration and jerk limit values
- Automatic speed and acceleration reduction dependent on curve radius to control with parameter
- Maximum cutting speed and low machine strain possible with smoothing of cutting contours through spline approximation
- Automatic compensation of the distance between knife edge and knife centre and extensive neutralisation of the knife radial force through adjustment of the tangential knife setting angle dependent on curve radius.
- Automatic lifting and plunge of the knife at angles with too big direction changing. Critical angle of direction changing, overcut and heelcut are adjustable with parameter.
- Automatic insertion of grinding cycles at the lifting points or if necessary cutting interruption for grinding cycles if the parameterised grinding distance is overstepped.
- Optimising of cutting sequence and notch sequence for minimising of empty

drives.
- Multifaceted possibilities for re-defining and parameterise for notches.
- Prick out the notches with a notch drill
- Start of the marker with dry run to simulate the cutting route.
- Special handling of doubled parts.

4.1.3 dividing cut

- Preliminary end dividing cut so that it's possible to change fabric roll already before cutting end
- End dividing cut with maximum x-position
- Different speed for dividing cut, parameterised separate
- Continuous dividing cut at the end

4.1.4 Graphics

- Multifaceted graphic functions for visualisation of the marker, for example zoom, parts selection, point selection, notch display
- Visualisation of cutting processes with online display of knife position and marking of finish cut parts
- Mark of any continuous point after breaking off

4.1.5 Parameter

- Adaptation to customer requests with multiple parameterise possibilities
- Comfortable parameter dialogue
- Free choose of dimensions
- Optional sorting of parameter
- Automatic consistency check
- Different help texts for all parameter
- Loading of material dependent parameter sets
- Generate and storage of new parameter sets
- Tool dependent parameter

4.1.6 standard control functions

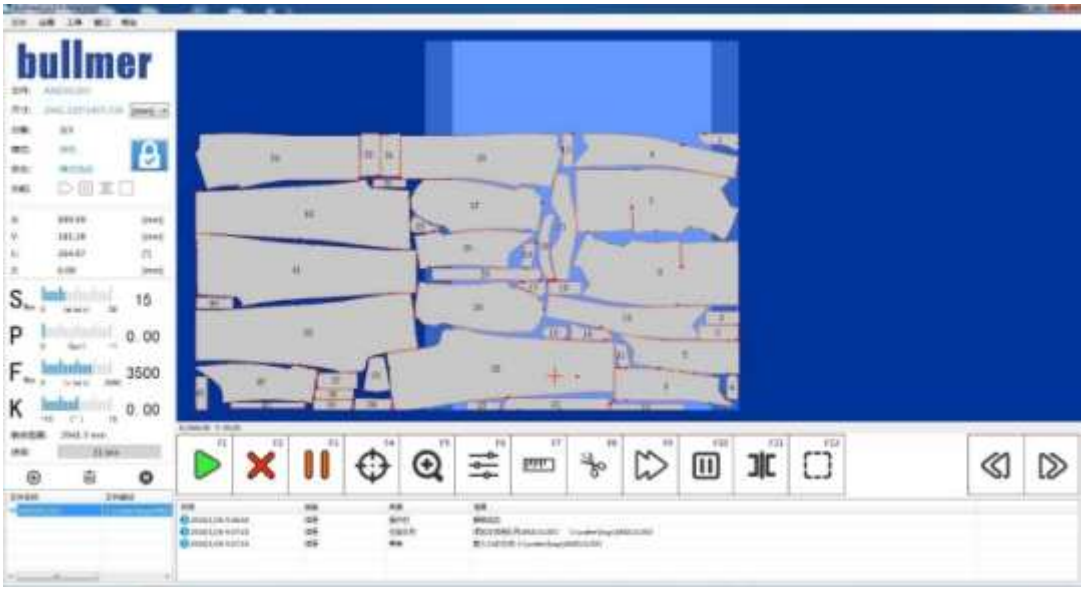
- Positioning of machine
- Emergency stop without reference loss
- Unlock machine
- Break and continue
- Cancel
- Control of machine with button at separate console

4.1.7 Machine

- Separation between drive and working area
- Tools: Rotary knife, stitching knife, drag knife, notch chisel, drill tool, camera, pen or spraying device
- Activation of different drills with different diameters with automatic drill changing; optional one or two drills
- Different grinding strategies: Standard grinding
- Automatic knife width correction over wear-out-factor and measuring of grinding cycles
- Parameterise of oil injection
- Knife offset correction respectively knife intelligence
- Knife lifting frequency dependent on speed for the oscillating knife
- Cutter special execution with separate second c-axis and dichotomy of table in conveyor and cutting strip
- Cutter special execution with a z-axis for the mould
- Vacuum regulation
- Control of a joystick

4.1.8 Others

- Operating system
- Windows surface which can be configured
- Network
- Detailed logging
- Optional language choose
- Optional mode choose



Picture 4-1 the operating interface for the cutter

4.2 Operator Interface / General

The operator interface is programmed in window technology in accordance with the modern standard. In principle, the operation takes place with the mouse. Normal functions can also be selected using the function-buttons <F1> to <F12>. In this way either functions are started or further menus are accessed, the interface of the software for operating the cutter is shown as the picture 4-1.

4.2.1 Information Display Window

1) Software Information Window

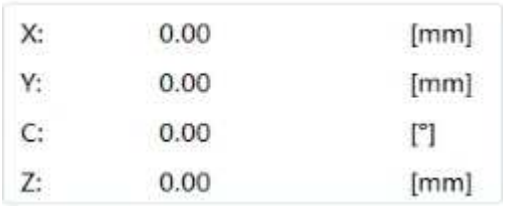
Software information window display the basic information of the software, including the current CAD file, the size, the number tasks, the mode, the state of the machine and the function chose. The software information window is shown as the picture 4-2.

Picture 4-2 Software Information Window

2) Positions and Coordinates Window

The positions and coordinates window displays the coordinate of the current position int the x-axis, Y-axis, M-axis and C-axis.

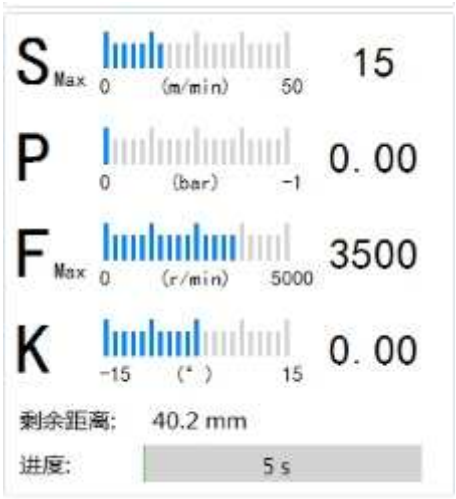
The positions and coordinates window is shown as the picture 4-3.



Picture 4-3 The positions and coordinates window

3) Information state window

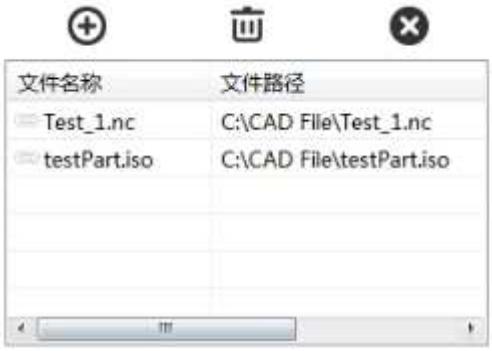
The state information window displays the important information of the machine on the top left corner. The operating state of the machine is displayed in this window, including the max cutting speed, the max frequency for the knife, the pressure of the cutter when it is in vacuum, the correction angle of the knife intelligence, the rest distance for the version and the cutting state. The current state of the machine can be known thorough these. The state information window is shown as the picture 4-4.



Picture 4-4 state information window

4) Work list window

In the work list window, all the markers which have been chose to cut will be listed. CAD files can be added by using the Open File button, unnecessary CAD files can be deleted by using the Delete File button, use Clear All button to clear the work list, in this case, all the files in the work list will be deleted, the work list window is shown as the picture 4-5.

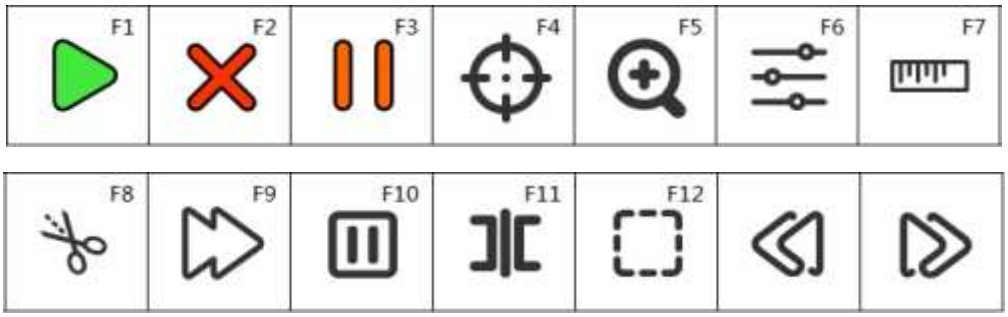


Picture 4-5 work list window

5) Operation Bar widow

The operation bar is on the bottom of the main interface of the software, below the file display area. The operation bar has 14 functional buttons, which have different uses. The first 12 functional buttons can be operated by using the shortcut key F1 to F12 to operate, the rest two buttons represent The Previous Page and The Next Page.

The introduction for each functional button is shown below. The operation bar is shown as the picture 4-6.



Picture 4-6 operation bar window

Shortcut Key	Functions
F1 Start	Press the button to start to cut
F2 Stop	Stop the action
F3 Pause	Pause and keep the action
F4 Open the position window	Open the position window
F5 Display the cutting piece	This functional button is used for display the entire version for the picture
F6 Quickly Set	Click this button to enter the sub-window quickly to set the normal parameters for the cutter
F7 Measure CAD	Used for measuring CAD
F8 Choose the cutting piece and restart to cut	Restart to cut the chosen cutting piece

F9 Pause the bitefeed	Pause the bitefeed
F10 Pause the TC	Pause the bitefeed TC
F11 Multitask line	Used for control or not display the multitask lines
F12 Dry Run	Start to dry run
The previous page	
The next page	

6) Logs window

The system provides a powerful information system. The related information of the machine can be checked on the bottom of the window (information window) in theoretic. At any time, the operation information of the cutter can be checked . The latest information is showed in the information window continuously. You can check the old information by rolling up the tools bar.

The final information list is named EventLog. In the log files, all the information and actions are recorded in real-time. The information and records (functional confirm key, etc.) will also be displayed in the logs window. The information includes signs, time, types, sources and information contents. The information logs window is shown as the picture 4-7.

Picture 4-7 Logs Window

Right click the information window and the menu for search the content of the information will appear. You can search the types of the information in order to search more conveniently. If the information n the information window is too much when some wroth checks or reparations are taken, right click the mouse button and choose Clear the Information to clear all the information in the current window in order to

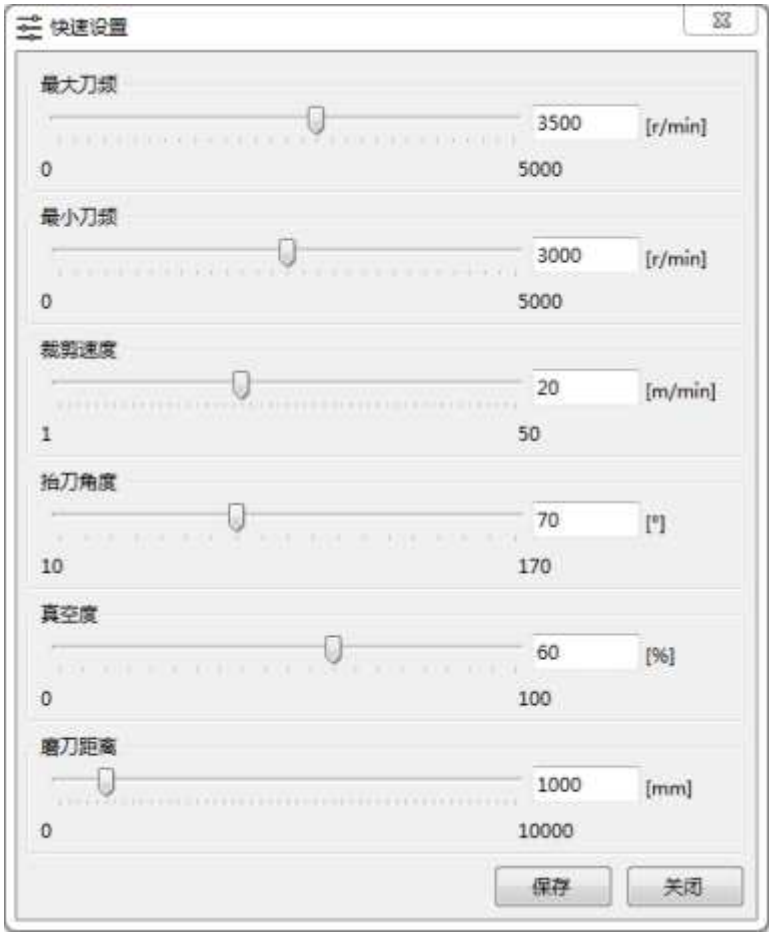
avoid the interrupt of the current information.

The sources of the information has higher level software and lower level software, the faulty source can be determined easily thorough the information source, which is easily to check and maintain. There are three types information included: wroth information, warning information and regular information. Users can take the related measures according to the information provided. The logs selecting window is shown as the picture 4-8.

Picture 4-8 The logs selecting window

4.2.2 Quickly Setting Window

The quickly setting window is used for setting the normal parameters of he cutter, the quickly setting window is shown as the picture 4-9.



Picture 4-9 quickly setting window

4.2.3 Display Setting Window

Some special CAD files can be set through the display setting window. Choose the form needed, for example, display punching. Select and then punching will be displayed in the CAD files in the cutting area, if not select then the punching will not be displayed. The display setting window includes: outer contour lines, inner cutting lines, inner drawing lines, words, high quality lines, notches, punching, changing the state of the notches, punching contour, drawing points, original points, the order of the cutting pieces, the display of the direction control.

For the complex CAD graphs, there are many lines, so it is especially important to select some of the information to display by using this window. The display setting window is shown as the picture 4-10.

Picture 4-10 Display Setting Window

4.2.4 Zooming Window

Zooming window is used for setting the zooming proportions and the zooming distance in X and Y direction. The cutting pieces will zoom in or zoom out in X or Y direction according to the setting proportion after it is applied.

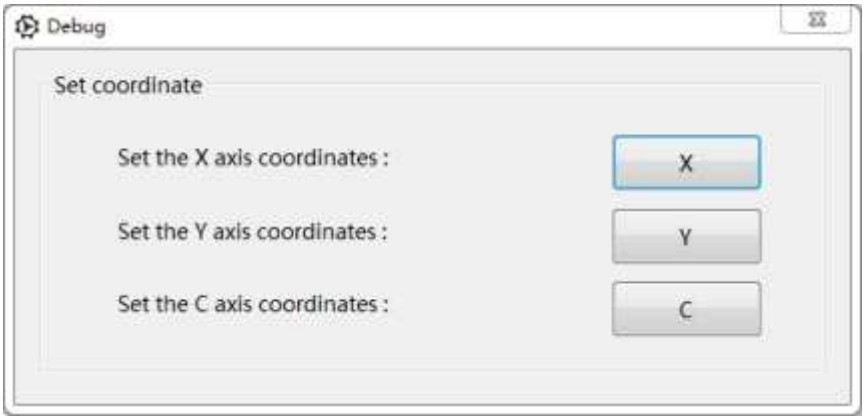
The zooming window is shown as the picture 4-11.

Picture 4-11 Zooming Window

4.2.5 Original Point Setting window

Open the Original Point setting window. Under the standby mode, the original points in X-axis, Y-axis and C-axis can be set correspondingly.

The Original Point Setting window is shown as the picture 4-12.



Picture 4-12 Original Point Setting Window

4.2.6 Testing Tools Window

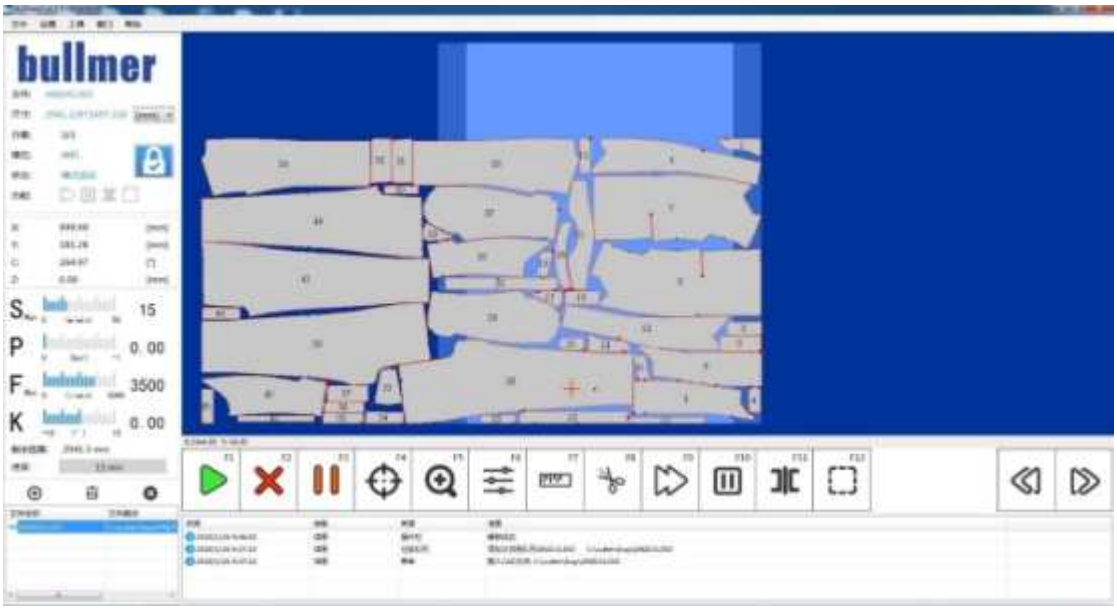
Testing Tools Window is mainly used for the debugging and the supervision of some functions and the test of the PLS variables. The testing tools window is shown as the picture 4-13.

Picture 4-13 Testing Tools Window

4.3 Start the software

The software displays as the picture 4-14 when the system software starts. The software is in locked state after starts. In order to operate the cutter, the power in the control panel need to be turned on to lock the software.

The concrete operation steps are: Turn on the power--> Unlock the machine

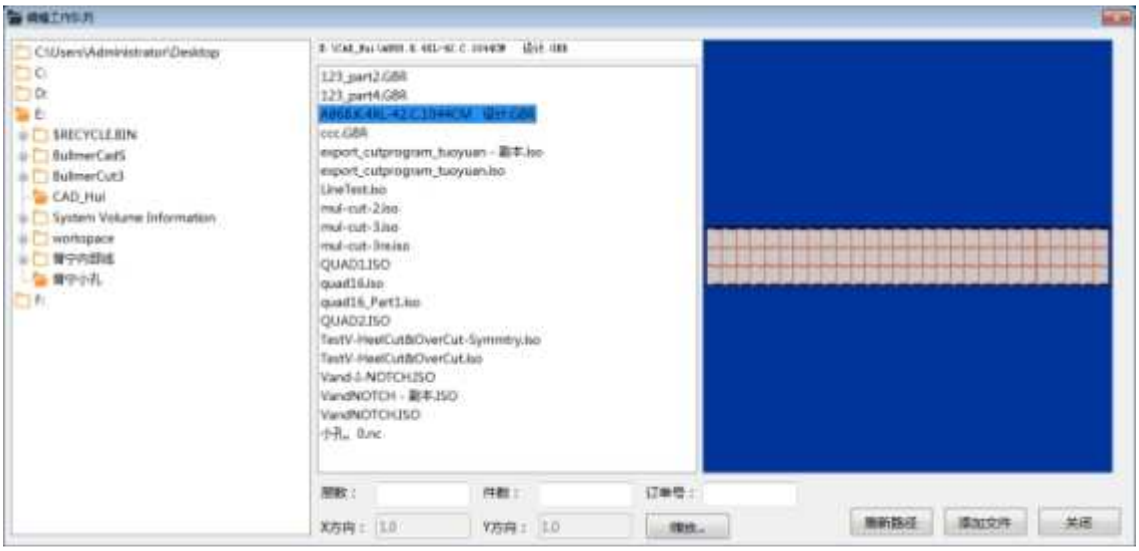


Picture 4-14 Cutter Software Interface

4.4 Start a Marker

If a new marker needs to be cut, the CAD files can be added to the work list window thorough the *Editing the Work List* window. The *Editing Work List* window is shown

as the picture 4-15.

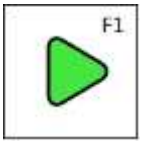


Picture 4-15 Editing Work List Window

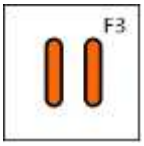
In the Editing Work List window, the marker which is needed can be previewed through the preview window, the select Add Files button to add the selected files to the work list. The number of layers, amounts, the number of orders and the zooming in/out can be input manually in this window.

If the marker expected has been existed in the correct position in the window, click Start to start manual mode, then use the joysticks on the control panel to locate manually, and then click Enter button to start to cut the marker, the original point from which the cutting starts is set as the manually positioned point.

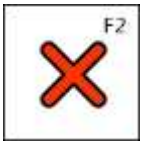
4.5 Cutting Process



F1 Start to Cut: A new marker has been added. Under the standby mode, use the icon Start to Cut to enter in the manual mode. Enter and Pause button twinkles alternately to notify that the manually positioning process has started. After manually positioned, cut in the order which has been made.



F3 Pause: Use Pause button to stop bitefeed. The machine is till in the current cutting process and been unlocked, so other essential functions can not been taken.



F2 Stop: If the cutting task need to be canceled in the cutting process,

press this button.

1) Cutting with bitefeed operation

If the marker is longer than the working area of the cutter, it will be cut with bitefeed operation. If you fix the start-point of the marker, the system compares the table dimensions with the dimensions of the marker and calculates independently which parts are in the working area and can be cut immediately. After cutting of this cutting window a bitefeed of the bristle conveyor will happen automatically so that you can start with the next cutting window directly.

2) With marker in the bitefeed, the cutting process:

At the cutting of the first cutting window, a so called bitefeed plunge is carried out at the end of the cutting window. The vacuum will be drop automatically at the end of a cutting window and the bristle conveyor will be carried out.

Bristle conveyor and the cloth conveyor are moved synchronized ahead and the material is transported in direction of the clearing conveyor so that the area of the second cutting window is on the working area. The cutting head is positioned on the bitefeed plunge.

You have to confirm now the position of the bitefeed plunge with the <Enter>-key at the operation terminal, another reference sequence can be carried out (checkpoints of the second cutting window). Afterwards the next cutting window will cut. This process will be repeated until all cutting windows of the marker are cut.

4.6 Finishing Program

You can finish the program by clicking the closer (the cross on the right-hand side above in the main window) of the system window. If a cutting process is

active you first have to break it off by clicking Cancel before try to leave the system. The program is finished after the confirmation.

CHAPTER V FURTHER FUNCTIONS

5.1 Stop/Continue Cutting

5.1.1 General

Usually (if the operator has not selected another function) the marker, i.e. the cutting process is shown in the monitor while cutting. To interrupt the cutting procedure you now have several possibilities as follows:

- Break off the cutting procedure at the machine terminal.

Simply press the STOP key at the machine terminal.

- Interrupt with the mouse or the keyboard of the cutter computer.

On the first toolbar you can find the function Stop. If you Click with the mouse on the corresponding icon or press the functional key F2, the cutting procedure will stop.
After breaking off a cutting procedure you can continue again directly. Press the functional key F1 or click the corresponding icon then it will restart.
You have to use the Restart in the panel or the Start in the tools bar to continue cutting from the breakpoints after the cutting program is stopped.

5.1.2 Continue after Emergency stop

If a cutting-process is stopped through an emergency stop, the machine must be unlocked again and be initialized before you can continue. Dependent on at which action the cutting process was interrupted (cutting or bitefeed), continuation of the machine must be executed in different ways.

1) Emergency-stop during cutting

1. Recover the Emergency button
2. Press the Power In button (control panel)
3. Unlock (icon unlock)
4. Switch on vacuum
5. Start to cut

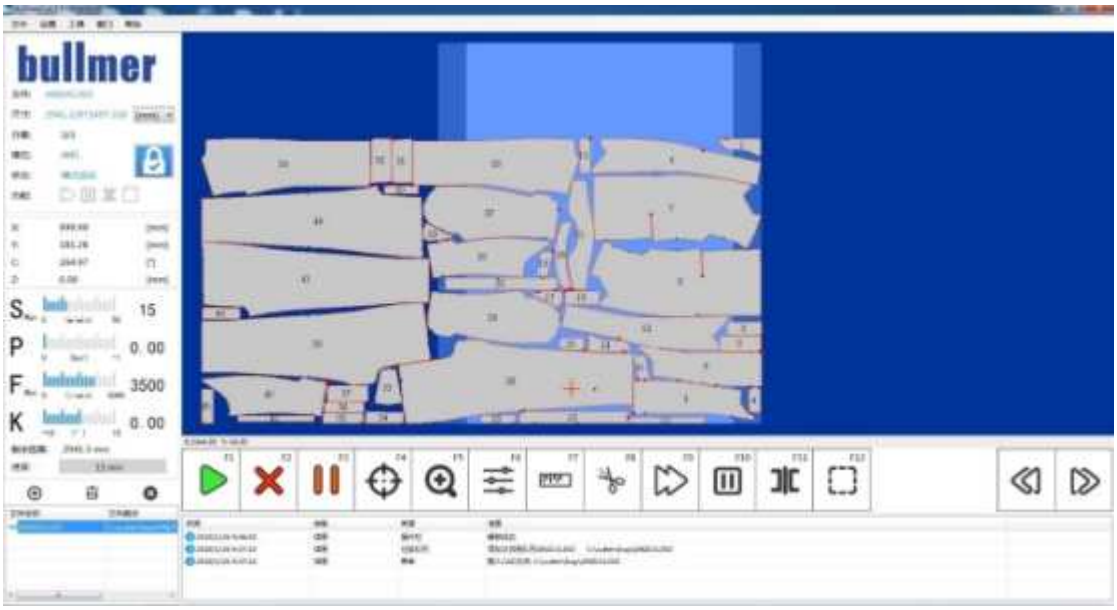
2) Emergency-stop during bitefeed

1. Recover the Emergency button

2. Press the Power In button(control panel)
3. Unlock (icon unlock)
4. Switch on vacuum
5. Start to cut
6. Select whether to continue to bitefeed or not

5.2 Graphics Functions

The graphics provide many functions for you, help to check the functional details for loading. If a marker is loaded, the system will display the graphics in the window automatically. After open the cutter software, the original display interface is shown as the picture 5-1.



Picture 5-1 Original Display Interface

Now the following operation can be made in the graphics:

1) Zoom in/out

The pointer is put on the pointed graph, the picture can be zoomed in or zoomed out by rolling the roller on the mouse to check the details of the CAD picture more carefully. If the graph changed needs to be reset, right click the mouse and then the graph will change to the original size.

2) Cutting pieces rolling over

Open Settings--> Parameters Settings--> Assistant Operation--> X domain--> Rolling Over in the Y-axis--> Domain 180° Rolling Over, then the CAD graph can be rolled over by 180° along the X-axis or Y-axis in the window.

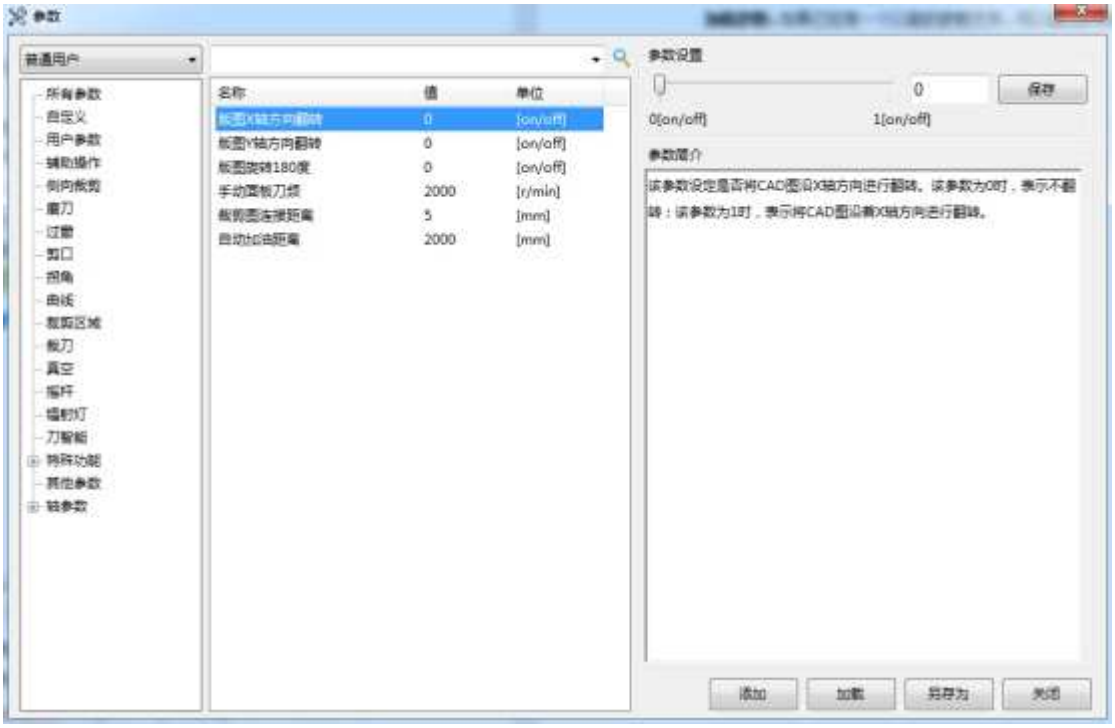
5.3 Parameters Setting

5.3.1 General

You can select Setting--> Parameters Setting to open the parameters setting window. The instructions of the changing, storing and loading of the parameters can be found in the Parameters Setting.
All kinds of parameters are set only for a certain action of the machine and the needs of a optional device. So the parameters list should be adjusted under the different mode.
The parameters in the parameter list can be searched by using the function of searching parameters. Enter a part of the name of the parameters to filter the words, then the parameters which includes those part of words will be displayed. Also, all the parameters are classified by different mode. If you select the list which is on the left of the dialog box, the parameters for this class will be displayed in the parameters list. Then each parameter and in which parameter class you can find the parameter will be told in the following.
If the you are familiar with the related parameters, then you can find the needed parameters according to the classification which is in the parameters list, then click the related classification, the parameters which are included in the same class will be displayed in the list window, now the parameters can be selected to do change.
For each parameter, the range of value has been set and can not be exceeded. When the value exceed the preset range, the value can not be input and the error *The Value Is Out Of The Range* will occur.

5.3.2 Parameters Settings

The Parameters window is shown as the picture 5-2, the window achieves the functions of the *classification*, *display*, *quickly searching*, *adding parameters*, *loading parameters*, *changing parameter*s and *saving the parameters as* for the cutter parameters.
Parameters classification: Classify the parameters according to their belonging parameters class. The stuff who is familiar with the cutter can find the related parameters quickly, then does the operation of Check, Change and so on. For instance, if the Cutting Angle Limit need to be replaced, then select *Cutting Angle--> Cutting Angle Limit*.
Parameters Display:
Parameters display includes two parts, one is in the center of the window to display the simple information of several parameters; the other is on the right of the window to display the information of a single parameter, including the range, unit and instructions of the parameters.



Picture 5-2 Parameters Window

Quickly Searching:

If the name of a parameter is known, then the parameters can be located quickly by using the function of searching. There are two ways for you: Accurate search and Fuzzy search. For example, if the Cutting Angle Limit need to be replaced, then you can input Cutting Angle Input to take accurate search, or you can input Angle to take fuzzy search.

Change Parameters:

Firstly you can find the parameter which needs to change by parameters classification or search, then you can change the related parameters according to the range of the value provided. After finish parameters change, click Save button.

Save the parameters as:

Different cutting cloth may need different cutter operation parameters, the change of the parameters needs to be taken every times when cut a type of cloth. If the cloth need to be cut alternatively everyday, it will be very messy to change the parameters again and over again, because it will cost a lot of time and lower the working efficiency. In this case a parameters file can be created named as the cloth name, in which includes all the parameters for one type of a cloth, so the next time when you need the parameters file, just use the parameters file.

If the parameters file is kept for the next cutting, you can click sa*ve as* button, then a dialog will be popped-up, then you can select route and enter the name of the file to keep this parameters file in order to use it conveniently next time.

Load the parameters:

If there as been a parameter file, the old parameters can be loaded into the current parameters window by using the Load function in the parameters window, for the cutting use.

CHAPTER VI USERS PARAMETERS

The parameters setting window includes three types of authority setting: normal user, administrator, technicians. The parameters contents for the three types have some differences and increase progressively.
Parameters can be classified into different class according to different contents, users can locate the needing parameters quickly by clicking the parameters mode on the left. The types of parameters include All Parameters, Custom, User Parameters, Auxiliary Operation, Laterally Cut, Stoning, Bitefeed, Punching, Angle, Curve, Cutting Area, Vacuum, Joystick, Lasers, Knife Intelligence, Special Functions, Other parameters, Axis Parameters.
The user parameters will be introduced respectively according to the parameters type, It will be introduced in detail for those parameters which can only be seen in the certain authority.

6.1 All Parameters

All parameters display all the parameters under the three authorities, the parameter content can be seen in the parameter list in the center.

6.2 Custom

Users can add the parameters which needs to be changed frequently into the related parameters class according to users' personal need, in order to operate conveniently.

6.3 User Parameters

Cutting speed[m/min]
The maximum cutting speed for cutting.
This parameter set the maximum speed for cutting the marker, the unit is [m/min]. The maximum value of this parameter is limited by the maximum speed of the machine parameter. The setting of the cutting speed mainly determines on the nature of the cloth, heights and so on.
Cutting angle limit[°]
When the corner angle is less than this parameter, lift the knife when cut this corner angle.
Knife frequency at maximum speed[r/min]
This parameter shows the frequency of the knife drive in the muti-frequency cutting when the cutting speed achieves the maximum value.

Knife frequency at minimum speed[r/min]
This parameter shows the frequency of the knife drive in the muti-frequency cutting when the cutting speed achieves the maximum value.
Over-cut for outer contour line of the knife head[mm]
The extra cut for the outer contour line at the knife lifting area.
Over-cut for outer contour line of the knife tail[mm]
The extra cut for the outer contour line at the knife falling area.
Sharpening distance[mm]
This parameter defines that when the cut has reached a certain distance, take a sharpening action.
Knife width[mm]
The distance between the tip of the knife and then back of the knife.
Vacuum[%]
This parameter defines that analogue vacuum proportion of entering under the manual mode.

6.4 Auxiliary Operation\

Domain rolling over in X-axis[on/off]
This parameter determines that whether to roll over the CAD graph along the X-axis. The parameter 0 means that it does not roll over, the parameter 1 means that the CAD graph rolls over along the X-axis.
Domain rolling over in Y-axis[on/off]
This parameter determines that whether to roll over the CAD graph along the Y-axis. The parameter 0 means that it does not roll over, the parameter 1 means that the CAD graph rolls over along the Y-axis.
Domain rolling over for 180 degree[on/off]
This parameters determines that whether to roll over the CAD graph for 180 degree, it means that the CAD graph rolls over in the X direction and Y direction at the same time.
Manual panel knife frequency[r/min]
The parameter represents that the oscillation speed for the knife drive to control the knife drive oscillation button on the panel.
The connection distance for the cutting graphs[mm]
This parameter represents the shortest distance between two CAD graphs after connecting two CAD graphs.
Automatic refueling distance[mm]
After the distance of the knife drive move achieves this parameter, the refueling action will be taken.

6.5 Lateral Cut

Lateral cut frequency [r/min]
Lateral cut means cut along the Y-axis,this parameter represents the frequency for the

oscillation of the knife drive in lateral cut.

Lateral cut speed [m/min]

This parameter represents the cutting speed along the Y-axis when the cutting head take the lateral cut.

Lateral cut length [mm]

This parameter represents the cutting distance along the Y-axis when the cutting head take the lateral cut.

6.6 Stoning

Stoning left angle[°]

When this parameter defines stoning, the C-axis rotate to the needed angle on the left of the stoning, the left side means the left hand side when the person face to the blade.

Stoning right angle[°]

When this parameter defines stoning, the C-axis rotate to the needed angle on the right of the stoning, the right side means the right hand side when the person face to the blade.

Stoning Distance[mm]

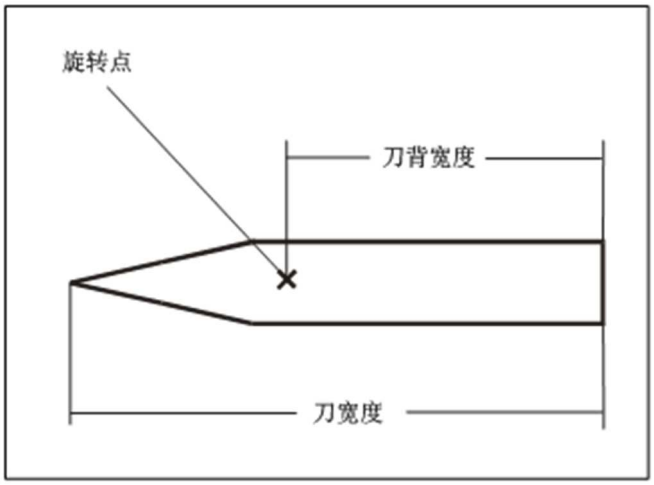
This parameter defines that when a certain distance has been reached during the cutting, stoning the knife after lift the knife.

Knife width[mm]

The distance between the tip of the knife and the back of the knife. The knife width of the back of the knife represents the distance between the rotating point and the position of the knife back.

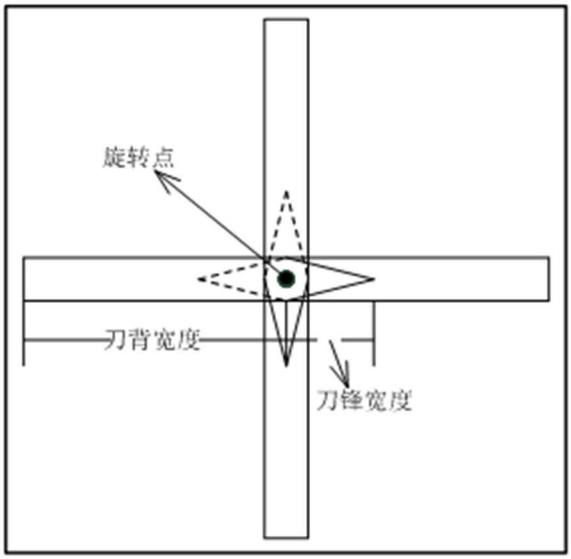
The movement of the knife needs to be calculated during the cutting process, the control software requires that the current measures keep the same. The width of the blade will decrease every time after one circulatory friction. So the parameter needs to be corrected after using for some time to get the accurate parameters and use the knife in the best way.

After the cutting knife is changed, the parameter for the knife width must be reset, the new knife width needs to be set manually. The knife introduction is shown as the picture 6-1.



Picture 6-1 The cutting knife

In the actual operation, the adjusting effect of the tool path can be verified according to the rotating point. Normally we can determine the rotating point of the knife by using the cross. Firstly, set the C-axis angle to be 0, the knife falls down to cut a straight line, and then cut a straight line when rotating the C-axis by 90 degree again and over again. The cross point is the rotating point of the cutting knife. The picture of the way for determine the rotating point of the knife is shown as the picture 6-2.



Picture 6-2 The rotating point of the cutting knife

The least knife width allowed[mm]

When the knife width of the software is less than that parameter value, we suggest that do not use it anymore.

The following authorities can not be seen by users:

Stoning time[ms]

The single side stoning time, the stoning time for a single side

Stoning frequency[r/min]

This parameter defines the oscillation frequency of the knife drive during the stoning.

Stoning abrasion[mm]

Stoning causes abrasion, as result, the knife width decreases. This parameter estimates the width decreased(the abrasion for each time), we suggest that change the range to 0.01-0.015mm.

Positioned Stoning[on/off]

This parameter determines whether to turn on the stoning function or not. Positioned stoning means stoning during the movement of the cutting head lift the knife.

6.7 bitefeed

Vacuum increases delay after bitefeed[ms]

This parameter represents the time costs for the transfer of the the bitefeed vacuum percentage to the manual vacuum percentage.

Vacuum decreases delay after bitefeed[ms]

This parameter represents the time costs for the transfer of the the manual vacuum percentage to the bitefeed vacuum percentage.

The following parameters can not be seen by normal users:

Bitefeed strategy[-]

When the parameter is 0, the cutting head moves to the start point of the next window directly without the movement of the bristle band after finish cutting and make a cross. When the parameter is 1, the cutting head moves with the bristle band synchronously and then the cutting head moves back to the start point of the next window after finish cutting and make a cross. When the parameter is 2, the cutting head moves down to the border of the cutter firstly, then moves to the original point along the border. Then the bristle band moves, finally the cutting head moves to the cutting start point of the next window.

Cross strategy[-]

The strategy for making a cross

Bitefeed vacuum percentage[%]

This parameter defines the analog input proportion for the vacuum pump when take the bitefeed.

Z-axis break distance[mm]

This parameter defines the positioning accuracy for the bristle band during the bitefeed.

Turn on the bitefeed keeping[on/off]

Turn on the bitefeed keeping function.

Cross point deviation[mm]

This parameter represents the deviation for the cutting head when make a cross. Setting the parameter larger than 0 can avoid damaging the cutting pieces when make a cross.

The length of the transfer panel[mm]

The length of the transfer panel, the unit is mm.

Press cloth switch[on/off]

The switch for the pressing cloth device

Z-axis coder accuracy[mm]

The accuracy adjusting parameter for the bristle band coder.

6.8 Punches

Cut the punches or not[on/off]
This parameter determines whether to cut the punches. When the parameter is 1, cut the punches; when the parameter is 0, ignore the punches without cutting.
Punches cutting angle[°]
This parameter defines the cutting angle for the V-type punches
Punches cutting depth[mm]
This parameter defines the cutting depth of the punches.
Punches distinguishing angle[°]
This parameter is used for distinguishing punches, its angle must be less than this parameter to be distinguished as an angle. If it is larger than this parameter, it will be regarded as an outer contour line.
Punches distinguishing upper limit[mm]
This parameter is used for distinguishing punches, defines the maximum depth of the punches.
Punches distinguishing lower limit[mm]
This parameter is used for distinguishing punches, defines the minimum depth of the punches.
The following parameters can not be seen by normal users:
Punches distinguishing supplement angle upper limit[°]
This parameter is used for distinguishing punches, if the supplement angle is larger than this parameter, then it can not be regarded as a punch.
Punches distinguishing supplement angle lower limit[°]
This parameter is used for distinguishing punches, if the supplement angle is less than this parameter, then it can not be regarded as a punch.
I-type punches cutting angle[°]
This parameter represents the angle between the I-type punch and the direction of the knife movement.
I-type punches cutting strategy[]
This parameter is used for the line-type cutting method when adjust the inaccurate knife width. If the knife width is accurate, select default strategy 0. 0 means that if the knife width is inaccurate, select knife tip supplement strategy when cut the line-type punches; 1 means that if the knife width is inaccurate when cut the line-type punches, select knife propulsion method to cut.
I-type punches knife tip supplement[mm]
This parameter means the supplement for the knife width when the knife width is inaccurate.
C-axis propulsion angle for the I-type punches cut[°]
This parameter represents the C-axis rotating angle of the knife cutting when the knife width is inaccurate.
I-type punches cutting speed[]

This parameter represent the punches cutting speed for the line-type cutting speed, line-type cutting speed=parameter value* the maximum cutting speed

V-type punches cutting speed[]

This parameter represent the punches cutting speed for the V-type cutting speed, line-type cutting speed=parameter value* the maximum cutting speed

Punches cutting parameters setting[on/off]

When the parameter is 1, the cutting angle and the depth are relevant parameters; when the parameter is 0, the cutting angle and the depth are CAD data.

Punches lifting cutting[on/off]

When the parameter is 1, cut all the punches of the current cutting piece firstly, then cut the contour line; when the parameter is 0, cut the contour line and cut the punches at the same time.

6.9 Corner

The corner parameters can not be seen by normal users:

Fixed knife width proportion[-]

This parameter defines the datum point of the knife when cut the corner angle.

Corner delay[mm]

If the parameter is larger than 0 when cut the corner angle, the cutting knife will move beyond a presetting distance and then rotate C-axis; when the parameter is less than 0, the cutting knife will rotate C-axis before the certain distance; when the parameter is 0, the parameter is invalid.

Corner angle cutting errors[mm]

The corner angle errors defines the maximum errors allowed at the corner. This parameter affects the smoothness of the corner, the parameter is smaller, the cut is more accurate at the corner angle. The suggesting parameter range is 0.01-0.5mm.

Corner angle cutting strategy[-]

Cutting strategy is a fixed width, it means that a point of the cutting knife is always on the side. The determination of this point relies on the fixed knife width proportion parameter.

Corner angle cutting quality[°]

This parameter defines the positioning accuracy of the corner angle. The parameter gets larger, the cutting accuracy decrease, the cutting speed is high. But it does not mean that it's better to set the parameter less, because when increase the accuracy of the cutting, the cutting efficiency decreases.

Corner angle distinguishing angle[°]

This parameter is used for distinguishing the corner angle. When the angle in the CAD graph is less than this parameter, it can be distinguished as a corner angle.

Corner angle distinguishing fault-tolerance[mm]

When the curve smoothness is on, make a triangle by using the three adjacent points of the corner angle. If the perimeter of the triangle is less than the parameter, it can be regarded and settled as a curve, 4.5mm default.

Corner angle minimum speed coefficient[%]

The minimum speed for the corner angle. The speed parameter of the corner angle when the current corner angle is close to the lifting knife angle.

Corner angle maximum speed coefficient[%]

The maximum speed for the corner angle. The speed parameter of the corner angle when the current corner angle is close to the lifting knife angle.

6.10 Curve

The following parameters can not be seen by normal users:

The minimum radius[mm]

This parameter represents the minimum radius of the curve. The curve speed is calculated according to the curvature combined with the maximum radius.

The maximum radius[mm]

This parameter represents the maximum radius of the curve. The curve speed is calculated according to the curvature combined with the minimum radius.

Curve smoothness[on/off]

This parameter determines whether to handle the curve smoothness. When the parameter is 0, it means that the curve smoothness is not handled; when the parameter is 1, it means that the curve smoothness is handled.

Add points to the curve at the C-axis turning angle[%]

This parameter means interpolation points is needed when the C-axis turning angle is too large. If C-axis turning angle is larger than this parameter, points will be interpolated.

The maximum knife frequency cutting speed[m/min]

This parameter represents the executable maximum cutting speed in the muti-frequency cutting.

The minimum knife frequency cutting speed[m/min]

This parameter represents the executable minimum cutting speed in the muti-frequency cutting.

The distinguishing upper limit for the C-axis compensation angle[°]

If the C-axis supplement angle is not 0 and the angle between the current and 2 previous continuous coordinate points is less than this parameter and larger than the distinguishing upper limit for the C-axis compensation angle, take compensation for the C-axis turning angle.

The distinguishing lower limit for the C-axis supplement angle[°]

If the C-axis compensation angle is not 0 and the angle between the current and 2 previous continuous coordinate points is larger than this parameter and less than the distinguishing upper limit for the C-axis compensation angle, take compensation for the C-axis turning angle.

C-axis angle compensation[°]

Take deviation compensation on the basis of the previous trajectory when cut the curve. If the parameter is larger than 0, deviate to the exterior for the center of the circle; if the parameter is less than 0, deviate to the center of the circle.

C-axis delaying deviation maximum length[mm]

In general, C-axis angle is the line direction of the current point and the previous point. If the length between the current point and the next point is larger than that parameter, use the line direction between the current point and the next point as the C-axis direction. The function is turned off by setting 0.

The curve minimum speed coefficient[%]

The minimum curve speed. The speed coefficient when the current curve radius is less than or equal to the minimum curve radius.

The curve maximum speed coefficient[%]

The maximum curve speed. The speed coefficient when the current curve radius is larger than or equal to the minimum curve radius.

6.11 Cutting Area

The following parameters can not be seen by normal users:

Valid cutting width[mm]

This parameter represents the valid cutting length in Y-axis.

Valid cutting length[mm]

This parameter represents the valid cutting length in X-axis.

Right protection width[mm]

Set the unavailable cutting area on the right(X-axis direction), the right protection width is the protecting width set for avoiding cutting the right side of the cutter in the cutting process.

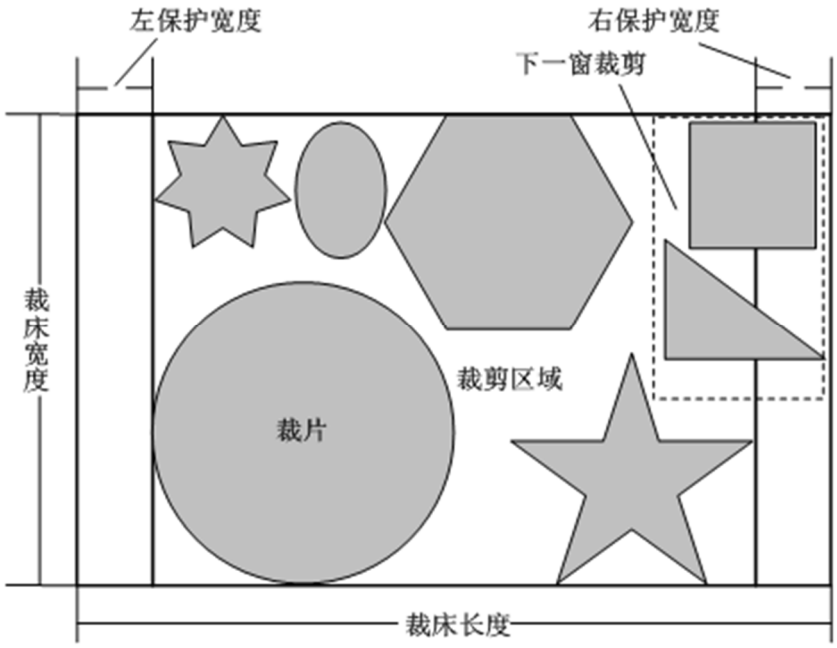
Left protection width[mm]

Set the unavailable cutting area on the left(X-axis direction), the left protection width is the protecting width set for avoiding cutting the left side of the cutter in the cutting process.

Left protection width[mm]

Right protection width[mm]

In order to do better in protecting the cutting table and the cutting head, set Left Protection and Right Protection in the Cutting Protection class. The left protection width is the protecting width set for avoiding cutting the left side of the cutter in the cutting process, the right protection width is the protecting width set for avoiding cutting the right side of the cutter in the cutting process. After set up Left Protection, when the CAD graph is loaded, deviate it behind the Left Protection automatically; after set up Right Protection, when cut and bitefeed, take the graphs in the Right Protection area as the next window. The means for the parameter Left Protection and Right Protection are shown as the picture 6-4.



Picture6-4 cutting protection

X-axis protection range[mm]
This parameter defines the protection range of the machine electronic control in X-axis, the parameter is suggested to be larger than the positive limit of the X-axis.
Y-axis protection range[mm]
This parameter defines the protection range of the machine electronic control in Y-axis, the parameter is suggested to be larger than the positive limit of the Y-axis.
The following parameters can only be seen by technician authority.
X-axis negative limit[mm]
The software negative limit in X-axis direction.
X-axis positive limit[mm]
The software positive limit in X-axis direction.
Y-axis negative limit[mm]
The software negative limit in Y-axis direction.
Y-axis positive limit[mm]
The software positive limit in Y-axis direction.

6.12 Cutting Knife

Knife width[mm]
The distance between the knife tip to the knife back.
The minimum cutting knife width allowed[mm]
When the knife width is less than this parameter, it is suggested not to use anymore.
Automatic oiling distance[mm]
When the operating distance of the knife drive reaches this parameter, an oiling action will be take automatically.
The following parameters can not be seen by normal users:

Stoning abrasion[mm]
Stoning will cause knife width decrease, which is abrasion. This parameter estimates the width decreases each time(abrasion for each time), the changing range is suggested to be 0.01-0.015mm.
The width of the knife back[mm]
The distance between the center of the knife and the back of the knife.

6.13 Vacuum

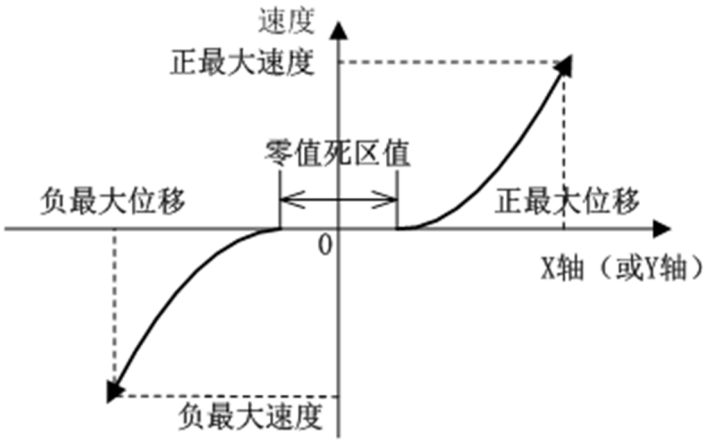
Vacuum increasing delay after bitefeed[ms]
This parameter represents the time delay of transferring the bitefeed vacuum proportion to the manual vacuum proportion after bitefeed.
Vacuum increasing delay before bitefeed[ms]
This parameter represents the time delay of transferring the manual vacuum proportion to the bitefeed vacuum proportion before bitefeed.
Vacuum concentration[%]
This parameter defines the proportion of the vacuum pump analog input in the manual mode.
Vacuum emergency stop strategy[on/off]
Vacuum emergency stop
The following parameters can not be seen by normal users:
Bitefeed vacuum percentage[%]
This parameter defines the vacuum pump analog input proportion when take the bitefeed.

6.14 Rocker

X-axis rocker speed[m/min]
In the manual mode on the control panel, this parameter defines the maximum speed which can be reached in X-axis direction.
Y-axis rocker speed[m/min]
In the manual mode on the control panel, this parameter defines the maximum speed which can be reached in Y-axis direction.
The following parameters can not be seen by normal users:
Rocker zero dead-zone value[-]
This parameter is used for defining rocker dead-zone value to control the influence from the rocker to the cutting head movement. When the parameter is large, it requires to oscillate the rocker substantially to move the cutting head. In contrast, if the parameter is small, the oscillation of the rocker required for moving the cutting head decreases.
Zero Dead-Zone Value[]
This parameter means that in the X-direction and Y-direction, the value in the zone is set to be zero. Set this value can improve users' experience to a certain extent.
If the **Zero Dead-Zone Value** is set to be small(or zero), it will be very sensitive

when use the rocker, move the rocker gently can get a large speed, the movement of the rocker will not be very horizontal(or vertical), other axis will move together; if the **Zero Dead-Zone Value** is set to be large, the rocker may die after a certain time, sometimes it will be mistaken thought that the cutter has some problems. So we suggest to set a reasonable parameter value when adjust the rocker parameter to enhance the comfort of using the cutter rocker. The parameters of the rocker is shown in the picture 6-5.

Note: The maximum displacement of the rocker is 127, so the **Zero Dead-Zone Value** should be less than the maximum displacement, it means that the **Zero Dead-Zone Value**<=127, it is set to be 30-60 in general.



Picture6-5 Rocker

6.15 laser Lamp

Lighting time for laser lamp[s]

This parameter represents the lighting time fro each time the laser lamp lighting button is triggered.

The following parameters can not be seen by normal users:

X direction laser lamp deviation(knife)[mm]

This parameter represents the distance between the laser lamp and the cutting knife in the X direction.

Y direction laser lamp deviation(knife)[mm]

This parameter represents the distance between the laser lamp and the cutting knife in the Y direction.

X direction laser lamp deviation(main drill)[mm]

This parameter represents the distance between the laser lamp and the main drill in the X direction.

Y direction laser lamp deviation(main drill)[mm]

This parameter represents the distance between the laser lamp and the main drill in the Y direction.

6.16 Knife Intelligence

Knife intelligence parameters can not be seen by normal users:
Knife intelligence function[on/off]
In the cutting process, in order to get a better cutting result, set Knife Intelligence Switch parameter. When the parameter is 0, do not turn on the knife intelligence switch; when the parameter is 1, turn on the knife intelligence switch. This parameter is used with the Knife Intelligence Intensity and the Knife Intelligence Sensitivity.
Knife Intelligence correcting intensity[V]
Measure the curves degree of the cutting knife by using the sensor signal and then adjust the parameter of the correcting intensity according to the curves degree. If the input value of the sensor is in the dead-zone of the knife intelligence sensitivity, the output is 0.
Knife intelligence right dead-zone value[V]
Different knife intelligence sensitivity need to be set according to different needs when cut different cloth. The parameter is smaller, the sensitivity of the curves degree is larger; the parameter is larger, the sensitivity of the curves degree is smaller. Then the cutting knife can swing to different extent to get a better effect in cutting process.
Knife intelligence left dead-zone value[V]
Different knife intelligence sensitivity need to be set according to different needs when cut different cloth. The parameter is smaller, the sensitivity of the curves degree is larger; the parameter is larger, the sensitivity of the curves degree is smaller. Then the cutting knife can swing to different extent to get a better effect in cutting process.
The maximum value for the knife intelligence[V]
The maximum value of the correcting angle when define the knife correction.
The minimum value for the knife intelligence[V]
The minimum value of the correcting angle when define the knife correction.

6.17 special functions

- **Inner angle**

1. Inner angle do not lift knife switch
The definition for the inner angle cutting strategy. 0. if the lifting condition is satisfied, lift the knife; 1. no mater whether the lifting condition is satisfied, do not lift the knife.
The following parameters can not be seen by normal users:
1. Inner angle over-cut[on/off]
Whether to handle the tail over-cut specially at the lifting knife which is larger than 180°.
2. Inner angle tip over-cut[mm]
Extra cut at the lifting knife when the angle is larger than 180°.
3. Inner angle tail over-cut[mm]
Extra cut at the falling knife when the angle is larger than 180°.

- **Inner Line<not for normal users>**

1. Inner line knife tip over-cut[mm]
The extra cutting for the inner cutting line at the knife lifting.
2. Inner line knife tail over-cut[mm]
The extra cutting for the inner cutting line at the knife falling.

- **Punching**

1. Punching function[on/off]
When the parameter is 0, ignore punching; when the parameter is 1, take punching action.
2. Main drill keeping time[ms]
The punching drill keeping time during the punching.
3. Punching order[]
Set the punching order, 0 means punching first and cutting second; 1 means cutting first and punching second.

The following parameters can not be seen by normal users:

1. X direction laser lamp deviation(main drill)[mm]
This parameter represents the distance between the laser lamp and the main drill in the X direction.
2. Y direction laser lamp deviation(main drill)[mm]
This parameter represents the distance between the laser lamp and the main drill in the Y direction.

- **Cutting Order**

1. Sort cutting pieces automatically[-]
The order of the cutting pieces are optimized automatically, 0 means do not optimize it, 1 means optimize it, 2 means optimize it automatically and cut the smaller pieces first.
2. X direction typesetting width[mm]
This parameter represents the width in X direction when the cutting pieces are sorted.
3. Y direction typesetting width[mm]
This parameter represents the width in Y direction when the cutting pieces are sorted.
4. Small pieces area[-]
In the condition of cutting the small pieces first, cut the small pieces which is in the actual cutting typesetting width. The unit is the area of the small pieces, the small piece is smaller than this area, 5000mm default.
5. Cut in inverse order[om/off]
When optimize the cutting order, set the cutting order inversely.
6. Sorting range display[on/off]
After the parameter is opened, the order range of the X-axis and Y-axis can be displayed.

- **Do-not-cut selection**

1. Intelligent do-not-cut selection[on/off]

The following parameters can not be seen by normal users:

- **CAD correction**

1. Deleting threshold
This parameters is used for controlling the sparsity of the controlling points, the

suggesting parameter range is 0-0.3mm.
2. Curves adding-points button[on/off]
This parameter defines whether to add points on the curve .
3. The distance for the adding points on the curve[mm]
This parameter defines the distance for the adding points on the curve, after the function is on, when the distance between two points is larger than this parameter, do not add points between these two points.
4. Curves smoothness angle[°]
This parameter defines the curves smoothness, three points defines a curve. Handle smoothness work to the part where the turning angle is larger than the smoothness angle in the curve.
5. Curve smoothness switch[on/off]
This parameter defines whether to turn on the curve smoothness. Curve smoothness function means to adjust the position of the points to make the curve seem to be more smooth.

- **Lifting and falling knife delay**

1. Lifting knife delay[ms]
This parameter represents the delay during the time between the knife drive lifting and the knife plate lifting.
2. Falling knife delay[ms]
This parameter represents the delay during the time between the knife plate falling and the knife drive falling.

- **Critical deceleration**

1. Turn on critical deceleration[on/off]
The speed will decreases after the function is turned on when the pieces which has been cut is less than the critical deceleration distance.
2. Critical deceleration coefficient[%]
When critical deceleration works, the speed decreases to the percentage of the preset speed.
3. Critical deceleration distance[mm]
This value represents the maximum value for the critical deceleration, any value which is less than this parameter must decrease.

- **Fracturing knife check**

1. Fracturing knife check[on/off]
Fracturing knife check switch.
2. Pressure check[on/off]
Pressure check switch.
3. Knife cooling check[on/off]
Knife cooling check switch.

6.18 Other Parameters

Other parameters can not be seen by normal users:
HSC Conterror Value[mm]

This parameter do not need to change, using the default value is OK.

Automatic transferring frequency[Hz]

The automatic transferring button in the control panel is used for controlling automatic transferring, this parameter represents the transferring speed of the bristle band and the transclear.

The minimum knife frequency factor[r/min]

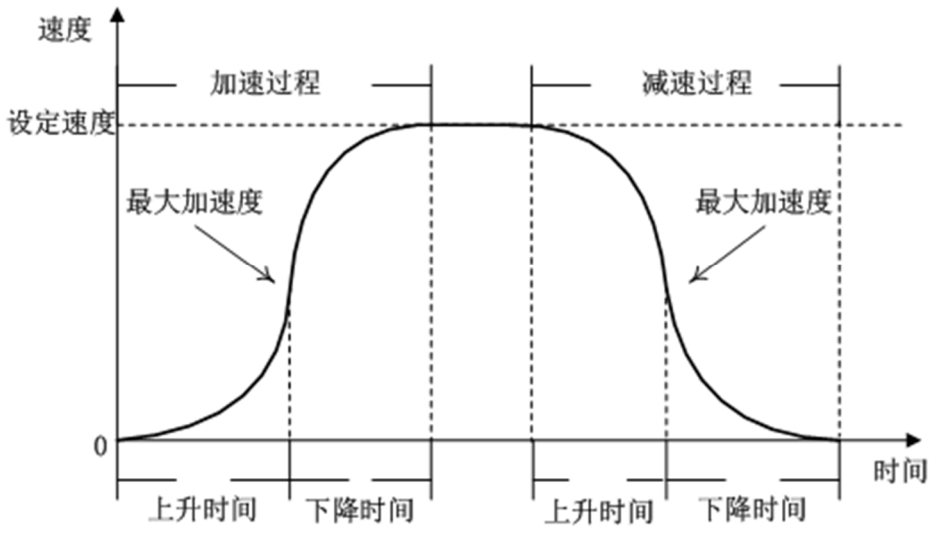
This parameter do not need to change, using the default value is OK.

6.19 Axis Parameters

Axis parameters can only be seen under the technicians' authority:

In the parameters class, axis parameters is an important part in the cutting function of the cutter. Axis parameters includes X-axis, Y-axis, C-axis and M-axis parameters, the basic functions for the four axis are the same. The following introduction does not appoint a specific axis and list all the possible parameters, this parameter can be used for all the axis parameters. For some axis, they have less parameters, only consider a part of them is OK.

The picture for the machine acceleration and deceleration is shown as the graph 6-6.



Picture 6-6 Acceleration/Deceleration Process

Maximum speed[m/min]

The upper limit of speed is allowed to set. This parameter should be larger than the speed which has been set(include the positioning speed and the interpolation speed value)

Acceleration[m/s2]

Set the acceleration during the interpolation, this parameter should be less than the maximum acceleration parameter.

Deceleration[m/s2]

Set the deceleration during the interpolation, this parameter should be less than the maximum acceleration.

Speed at G00[m/min]

The speed when the machine is located, this parameter should be set to be less than the maximum speed.

Deceleration at G00[m/s2]

The sets of the acceleration when the machine accelerates and deceleration when the machine decelerates during the machine positioning process are the same parameter. The set of this parameter should be less than the maximum acceleration parameter.

The maximum acceleration[m/s2]

The maximum acceleration allowed in the X-axis is the upper limit of all the acceleration in X-axis. This parameter represents that when the speed increases(decreases), the maximum acceleration allowed to set is the upper limit for all the acceleration set.

Emergency stop acceleration[m/s2]

This parameter represents the acceleration at the emergency stop, which works during the deceleration when CNC reports errors or the emergency stop button is triggered. The parameter should be set to less than the maximum acceleration parameter.

Lifting and falling time at G00[ms]

This parameter represents that the time costs for the acceleration and deceleration when the machine is positioned. This value should be set to larger than the minimum lifting time allowed parameter.

Acceleration lifting time[ms]

This parameter represents that when the speed increases, the acceleration lifting time works with the acceleration together, this value should be set to be larger than the minimum lifting time allowed parameter.

Acceleration falling time[ms]

This parameter represents that when the speed increases, the acceleration falling time works with the acceleration together, this value should be set to be larger than the minimum lifting time allowed parameter.

Deceleration lifting time[ms]

This parameter represents that when the speed increases, the deceleration lifting time works with the deceleration together, this value should be set to be larger than the minimum lifting time allowed parameter.

Deceleration lifting time[ms]

This parameter represents that when the speed increases, the deceleration falling time works with the deceleration together, this value should be set to be larger than the minimum lifting time allowed parameter.

Axis accuracy supplement

The adjusting parameter for the X-axis, Y-axis cutting accuracy.

CHAPTER VII OTHER FUNCTIONS

7.1 Reset Knife Width

After replace a knife, the knife width in the software must be changed to the related actual knife width size. The system provides the convenient mode to change the knife width in the software, the window of the resetting knife width is shown as the picture 7-1, select the related knife width size please.

Picture 7-1 Resetting Knife Width Window

7.2 Back to the positioning point

When it cut normally in the current window, press F2 firstly to stop running and then click the Back to the Positioning Point button, the cutting head will automatically move back to the start point of the three steps location. Then click F1 to start cutting, the system need to restart to set points and cut, the cutting will start at the first cutting piece in the current window. The Back to the Positioning Point window is shown as the graph 7-2.

Picture 7-2 Back to the Positioning Point window

7.3 Safe Mode

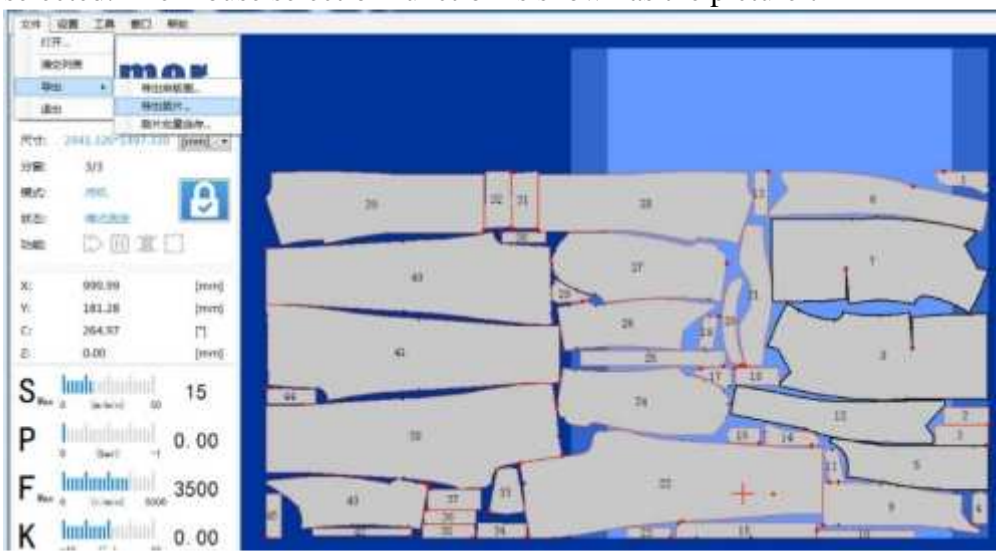
Press Ctrl+F3 under the manual mode to enter in the safe mode. Or you can press Safe Mode button shown as the picture 7-3 under the manual mode to enter into the safe mode.

Picture7-3 Safe Mode button window

7.4 Selecting and saving cutting pieces

7.4.1 Mouse selection

Press and hold ctrl to frame selecting and clicking the cutting pieces which is needed to save. After finish selecting the cutting pieces which are needed to save, release ctrl and use *File-->Export-->Export cutting pieces* to save the cutting pieces which are selected. The mouse selection function is shown as the picture 7-4



Picture 7-4 Mouse Selection Window

7.4.2 Select in order

Use the button by clicking *File-->Export-->Cutting pieces Saving in Batch* and a dialog will be popped, which is shown as the picture 7-5. Enter the cutting order of the starting cutting piece and the finishing cutting piece to achieve saving cutting pieces in order.

Picture 7-5 Selecting cutting pieces in order window

7.5 Select pieces not to cut

Under the standby mode or during the cutting, double click the mouse to choose the cutting pieces which have not been cut yet, the system will not execute to cut the piece.

7.6 Connection Function

The main use is to regard two cutting files as one cutting file to cut. Firstly add some cutting files which need to be cut, then right click the mouse at each cutting file, finally set the first cutting file as the connection point. The connection function window is shown as the picture 7-6.

Picture 7-6 Selection in order window

7.7 unit Conversion

This system provides the size cutting files, the conversion between the metric system and the British system. As shown in the picture 7-7, the units can be converted by using the drop-down menu directly.

Picture 7-7 Unit Conversion Window

CHAPTER VIII MAINTENANCE AND TECHINICAL DATA

8.1 Service Function

8.1.1 Machine Position

If the function positioning is chosen, press F4 and the positioning window is opened, in which you can input values for the axes X, Y, C, Z (bristle conveyor). By selecting the “Position” button the machine is positioned. The machine positioning window is shown as the picture 7-1.

Picture 7-1 Machine Positioning Window

To do this the machine must be in the STANDBY MODE.

X-AXIS AND Y-AXIS:

With help of this function, the machine can be positioned at an absolute coordinate with reference to the machine origin. Put in the desired position value and confirm with the “Position” button. Positioning takes place provided the value is within the allowable borders.

C-AXIS:

To position the C-Axis, you input the desired angle, in degrees, and confirm with the “Position” button. The C-Axis then turns to the desired position.

Z-AXIS:

To move the Z-Axis, you input the desired distance, and confirm with the “Position”

button. The Z-Axis then moves to the desired position.

8.1.2 Digital Input

Select *Tools-->Debugging-->Digital Input* to enter in the digital input window, the window surface is shown as the picture 7-2.

Picture 7-2 Digital Input Window

If the corresponded entrance is 1 or 0, you can catch the sight of the LED color displayed.

8.1.3 Digital Output

Select *Tools-->Debugging-->Digital* Output to enter in the digital output window, the window surface is shown as the picture 7-3.

The functions of this system can be debugged manually.

Notice: These switch-functions are used for service purposes – if used incorrectly they can lead to damage!!!

In the list of the digital outputs a checkbox is placed beside the displayed LEDs. Only when the checkbox is selected, the corresponding output can be switched by clicking onto the displayed LED.

Picture 7-3 Digital Output Window

IMPORTANT NOTE:

If you manipulate one of the exits through choosing the check box (mark) you have to pay attention absolutely that you switch off the check box before you leave the window.

The mark then will delete and the exit can take on the condition which is given from the program. Make sure that before you leave the window all marks are removed. If this will not happen a perfect SPS function can not guaranteed.

8.1.4 Markers for adjustment

In a separated table, you find some markers, which were produced for test - and adjustment purposes. Choose different testing files according to different testing functions to check whether the related functions is perfect. If the table statement is not altered with the installation, these are in following table:

C:\cutter

These test files are used for testing and adjustment of machine parameters and should be cut, with foil and under vacuum, on paper.

The list of the markers is:

Marker name	Application-purpose
QUAD200.ISO	The square with 200 millimeters of edge length can be used for checking of the tool offsets (x - and y-distance to the light pointer) for the knife. Before the cut the start point, which is approached with the light pointer, must be marked on the foil. Since the marker consists of only one square, the start point of the marker corresponds with the corresponding edge of the square (left low edge of the square with left execution, right low corner of the cutter with right execution). You can check after the cut, whether the edge of the square (the cut contour) is exactly on the marked light pointer position. If this is not the case, the values of the parameters "x-Offset knife" and "y-Offset knife" must be corrected accordingly.
QUAD400.ISO	The square with a edge length of 400 millimeters, is used, to check the accuracy of the x - and y-axis. The edge length of the square - cut from the paper – must be precisely 400 millimeters. If deviations in length or width occur, the corresponding parameter (dissolution xaxis or dissolution y-axis) must be corrected.
QUAD.ISO	Checking of the parameters dissolution x-axis or dissolution y-axis (sees QUAD400.ISO). This test file can also be used in order to check whether the bridge is standing diagonally on the machine table. If the bridge is not standing

	straight, the parts do not meet each other in x - and in y-direction in a 90° angle (parallelogram). This becomes clear if the cut square is folded diagonally.
KREUZ43.ISO	Checking of the bore offsets for the drill (M43). At right attitude of the tool offset (parameter "x-offset drill and "y-offset drill"), the boring must be precisely on the intersection of the cutting-lines..
KREUZ44.ISO	Checking of the bore offset for the help drill (M44), if a second drill marking device is existing. At right attitude of the tool offset (parameter "x-Offset Helpdrill" and "y-Offset Helpdrill") the boring must be precisely on the intersection of the cutting-lines.
NOTCH.ISO	Adjustment of the tool offset for the notch (Only for machines with separate notch tool). The pinches must be exactly in the middle of each edge of the square and must show all the pre-determined pinch depth. With deviations, the parameters "x-offset notch" "yoffset notch" and "pivot notch" must be changed.
CTEST.ISO	For adjustment of the C-axis. Two circles and two rectangles will be cut once clockwise and cut once counterclockwise. If the two circles are not equally big, this points out that the pinch is not in the mechanical pivot of the knife drive (knife guiding).
QUAD16.ISO	16 meters long marker, existing from squares with in each case 1m edge length. Is used to test the bitefeed.

8.2 List of dangers

No.	Type of danger	Solution principle	Acc. To standard
1	Danger through moving of the cutting bridge	Note in the operation manual Note at the machine Protective bow (EMERGENCY STOP)	EN 12100 VBG
2	Danger through cutting on the cutting knife	Note in the operation manual Note at the machine	EN 12100 VBG

3	Danger through crushing on the low holder or on moving parts	Note in the operation manual Note at the machine	EN 12100 VBG
4	Danger through working on the machine at not switched off machine and against unintentional switching on of the protected machine	Note in the operation manual Note at the machine	EN 12100 VBG
5	Danger of crushing on the conveyor, on transfer or moving of the machine (Mover-Cutter)	Note in the operation manual Note at the machine	EN 12100 VBG

8.3 Technical Data

Working Width		1800mm 2000mm 2200mm Special width need to be customized
Working length		That depends
The maximum cutting height		Depends on the material One layer-80mm(in vacuum condition)
The maximum positioning speed		It depends The maximum is less than or equal to 100m/min
The maximum cutting speed		It depends The maximum is less than or equal to 100m/min
Bristle Block		It depends
The maximum acceleration		It depends

		The maximum is 1.5g（g=9.81 m/s2）
Data Type		ISO Type GBR Standard Type
Data transmission	Offline	Hard disk
	Online	Networks (Internet or other networks)
Voltage in		400V/50Hz Special voltage is determined by needs
Power consume	Vacuum device	It depends
	Cutter	It depends on spec
Pressure vacuum costs while cutting		200 I/min at 6 Atmospheric pressure
Environmental effects		The control voltage for the controlling cabinet must be stable(the maximum tolerance+/-5%) The environment(actual temperature and moisture) should be suitable for the cloth which is handled(air condition).

8.4 Frequent Asked Questions

8.4.1 Cutter Software Problem

1) Q: What if the software collapse while using it?

A: In the process of using the cutter, some specific situations such as interruption,

abnormal operation and so on may happens, results in the collapse of the software. If in the cutting process, please use the emergency stop or safe button to power off the machine, and the turn off the software, then restart it.

2) Q: What if click the CAD files in the working list but can not open?

A: Some big CAD files will be loaded slowly, please wait for a while patiently. If they can not be opened for a long time, check the type of the CAD files firstly to ensure the types are available to cut. After confirm that the ways above can not open the CAD files, pleas contact our technicians or sent the email which includes the CAD file and the description of the question to our post-sale mail box, we will deal with it as soon as possible.

8.4.2 CNC controller problem

1) Q: What if the cutter software can not be operated and the driver is always twinkling?

A: The twinkling of the driver is caused by the connection break between the CNC control and the controller communication, the driver communication line and the power line connection should be checked whether is correct or not. If the cable is loosening, plugged the cable in securely, or turn off the CNC controller and restart it, then build the communication again.

8.4.3 Operation process questions

(1) Q:What if the power button in the control panel can not be turned on?

A: Check whether all the emergency buttons are reset or not.

(2) Q:What if the cutter software can not be unlocked after be opened?

A: Open testing tools window, check and determine which digital signal is abnormal, then check related circuit.

8.5 Contact Us

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