SMC4-4-16A16B

Four-Axis Motion Controller

Instruction Manual

SAFETY PRECAUTIONS

Before using this control system, please read this manual carefully before do related operations. Carefully read the operating instructions and user Safety Precautions, the user should do the appropriate protection, take the necessary security
measures before proceeding to operate.

A first-time operator, should know the proper use of the corresponding functions, you can perform the appropriate action, For those unfamiliar the functions or parameters, Prohibited actions or change system parameters.

System maintenance:

When the system is under unusual circumstances, the need to repair the appropriate cable or socket connection, you should turn off power. And then make the necessary repair.
If operator has not been rigorously trained or authorized should not open the control system for maintenance
operations, modification, repair, and other acts.

OUTLINE:

Our motion controller uses a high-performance 32-bit CPU, with an LCD display, Humanized Window-type interface, using external Micro SD memory, and touch keyboard. The system has high reliability, high precision, low noise, easy operation characteristics.

The controller can use four simultaneous axes, Simple, clear parameters for your convenience and fast operation. Input / output can be set up functions to facilitate your use and maintenance.

The Main function:

Parameter settings: You can set the processing and operations relating control parameters,

Manual operation: can be achieved manually, jog back to procedure zero, back to mechanical zero, cleared coordinate operations.

Program Management: Program, can create, delete, modify, read, preserve, automatic processing, continuous, and pause.

System components:

CNC system mainly consists of the following parts:
High-performance, high-speed 32-bit ARM CPU;
Liquid crystal display (resolution: 320 * 240);
Input / Output (16 channels opto-isolated 10MA inputs, 16 channels opto-isolated pull-down tank 500MA output).
Users machining program can be arbitrary Stored in Micro SD card.

Technical indicators:
The smallest unit of data 0.0001in
The maximum data size 99999.999in
Maximum pulse output frequency 50KHZ (three-axis simultaneous 50KHZ)
Control axes 4 axes (X, Y, Z, A)
4-axis intermodal and has a four-axis multi-micro multi-segment prospective interpolation control
Appearance and Panel: Dimensions: length 6.5″, width 4.0″, thickness 2.0″

External view:

OPERATING INSTRUCTIONS

This screen appears after the control system is powered.

FUNCTION SOFT KEY AREA

Open File: Open G-code file on Micro SD

Run: Start mid program, restart program

Machine: Machine Advanced Settings

Edit File: Edit G-code files of micro SD card

RESET: Resets Machine

AF: Work Shift Coordinates

This boot interface is divided into four zones:

• The top district: the main display file name now opens, real-time the number of processing rows.

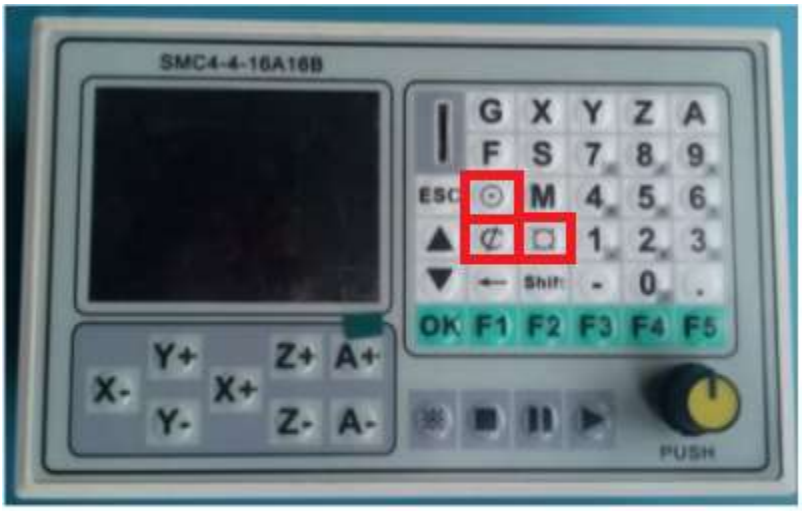
• The coordinate display area: The main display real-time Four-axis coordinate and real-time processing speed.

• The function soft key area: the main control keys.

• The file area: file name, or processed documents.

Because the system requirements for the Micro SD card data is extremely strict, so General low end Micro SD cards may not read, we recommend SD micro HC cards.

Hard Key Functions:



Origin (Return to Zero or Workshift Zero)
Coordinates (Set zero)
Manual jog (set increment of movement)

Origin:

Return to PZERO (return to work shift zero. G54 G55 etc.)
Return to HOME (return to set home position)
Probe (use a probe to touch work piece)
Return to ZERO (return to default zero)

Coordinates:

The X axis (Zero the X axis)
The Y axis (Zero the Y axis)
The Z axis (Zero the Z axis)
The A axis (Zero the A axis)
All Shaft reset (zero all axis)

Manual Jog

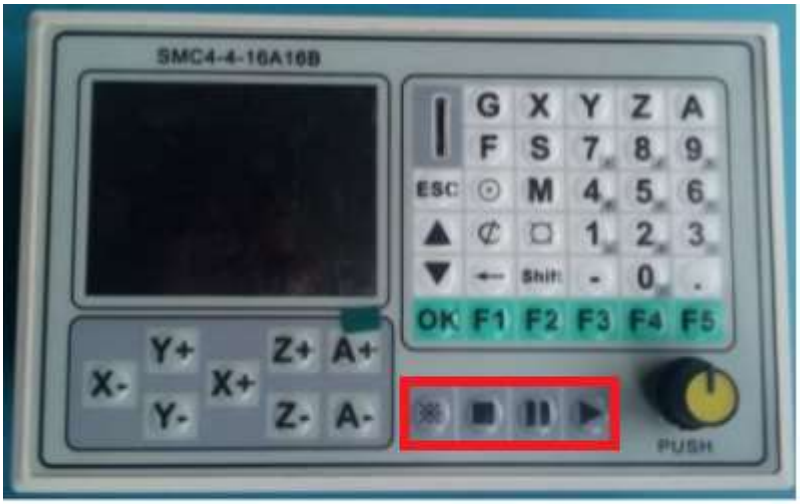
Manual (no specific value)
1mm (move 1 inch per button press, ignore MM in controller)
.1mm (move .1 inch per button press, ignore MM in controller)
.01mm (move .01 inch per button press, ignore MM in controller)
Blank input box (move custom amount)

Advanced Function Key:

Used to select function on screen, pushing in selects function

While running this knob will allow you to adjust feed rate in real time.

Function Keys:



Resets machine can be used mid program.

Stops program mid run.

Pauses program mid run.

Starts program, from top or cursor line.

Jogging hard keys:

coordinate jogging hard keys each moves thier respected axis.

XYZA hard keys:

X: Run from here (moves machine to value)
Changing coordinate (changes position to the value)

Y: Run from here (moves machine to value)
Changing coordinate (changes position to the value)

Z: Run from here (moves machine to value)
Changing coordinate (changes position to the value)

A: Run from here (moves machine to value)
Changing coordinate (changes position to the value)

G-Code Instructions:

command	parameter	Features	Remark
G00	X. Y. Z. A.	Fast-moving machine	According to the maximum speed of the machine for fast moving
G01	X. Y. Z. A. F.	Processing Run	F value is limited
G02	X. Y. Z. A. F.	Clockwise circular machining	
G03	X. Y. Z. A. F.	Counterclockwise circular machining	
G04	P	Delay	P values affected
G17	(X, Y) Coordinate plane		
G18	(X, Z) Coordinate plane		
G19	(Y, Z) Coordinate plane		
G28	XYZA	Back to the mechanical origin	It can be controlled separately or in combination
	P1X*Y*Z*A*	Assigned to the current coordinates	
	P2X*Y*Z*A*	Plus given the current coordinate values	
	P3XYZA	Conditional back to mechanical origin	Only after the effective power back through mechanical origin, then call this function is invalid
G54		Workpiece coordinate 1	Memory workpiece origin and mechanical origin offset value
G55		Workpiece coordinate 2	Memory workpiece origin and mechanical origin offset value
G56		Workpiece coordinate 3	Memory workpiece origin and mechanical origin offset value
G57		Workpiece coordinate 4	Memory workpiece origin and mechanical origin offset value
G58		Workpiece coordinate 5	Memory workpiece origin and mechanical origin offset value
G59		Workpiece coordinate 6	Memory workpiece origin and mechanical origin offset value
G80		End drilling instructions	
G81	X. Y. Z. R. F	Drilling instruction	Universal drilling
G82	X. Y. Z. R. P. F	Drilling instruction	Controllable bottom residence time
G83	X. Y. Z. R. I. F	Drilling instruction	Row pin drilling

G-Code Instructions 2:

instruction	parameter	Features	Remark
G90		Absolute value size	default
G91		Incremental dimension	

G-Code Instructions 3:

instruction	parameter	Features	Remark
M00		Pause instruction	Until you press the start button to continue
M03		Spindle Forward	Affected delay parameters
M04		Spindle reversal	Affected delay parameters
M05		Spindle stop	
M07		Spray Open	Affected delay parameters
M08		Cooling Open	Affected delay parameters
M09		Meanwhile Close M07M08	
M30		The total program is stopped	
M47		Loop instruction	Return to the first line to run

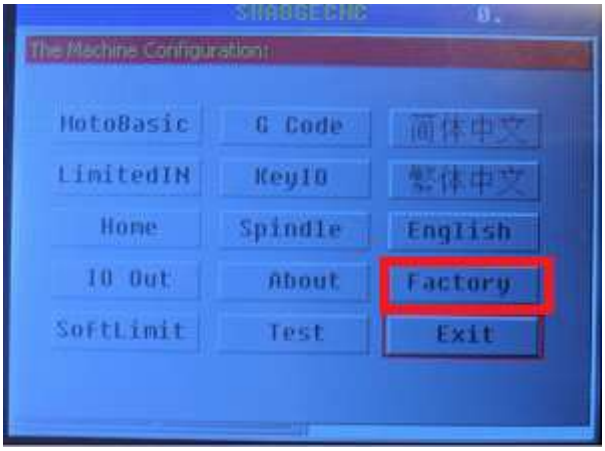
Machine Settings:

You can access advanced settings from the machine soft key.

Here you will be able to change stepper motor settings, language, g code settings.

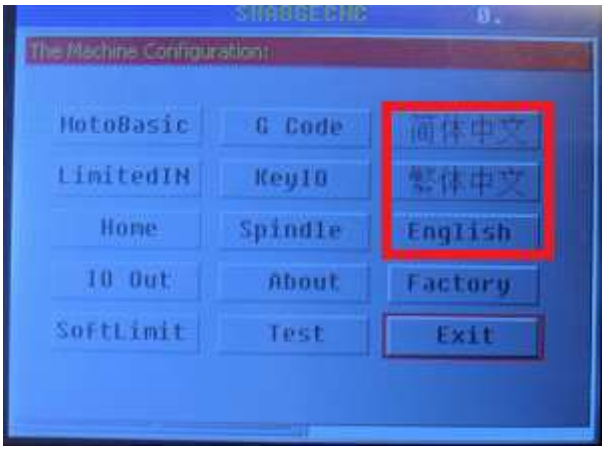
Please reference the information in this manual on those settings.

Advanced Settings: Reset



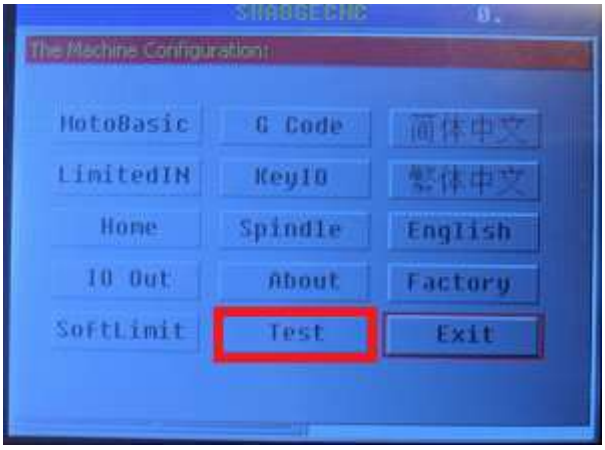
Factory reset: resets all settings to factory settings, if you use this option you will have to re-adjust MotoBasic and G-Code before being able to accurately run the machine again.
To factory rest select this option and input password. Default password: 085600

Advanced Settings: Language



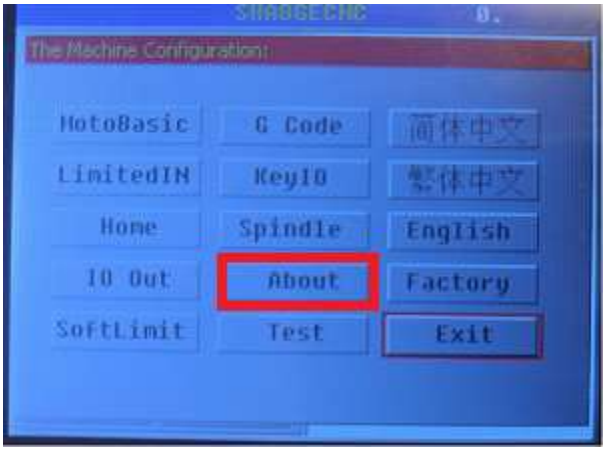
Language settings: default setting is English, from Semp Machine.

Advanced Settings: Test



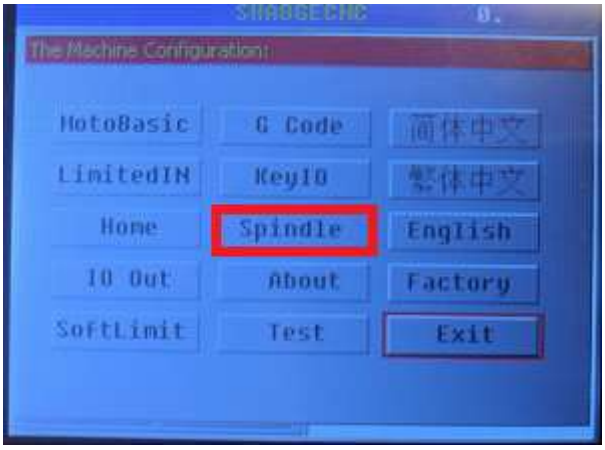
Allows you to test physical pins. Used for setting up limit switches ect.

Advanced Settings: About



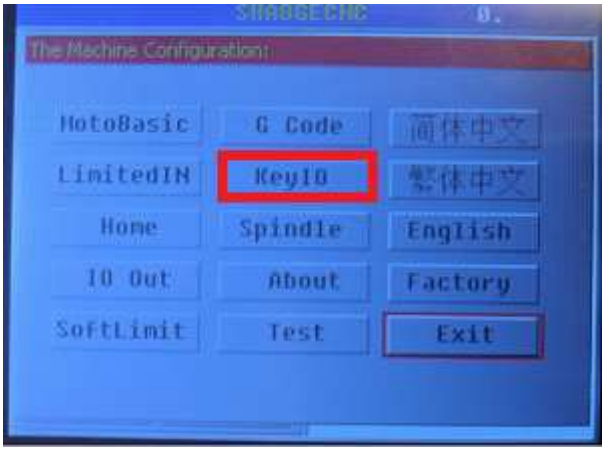
Displays system information. Firmware version, G-code version, ect.

Advanced Settings: Spindle



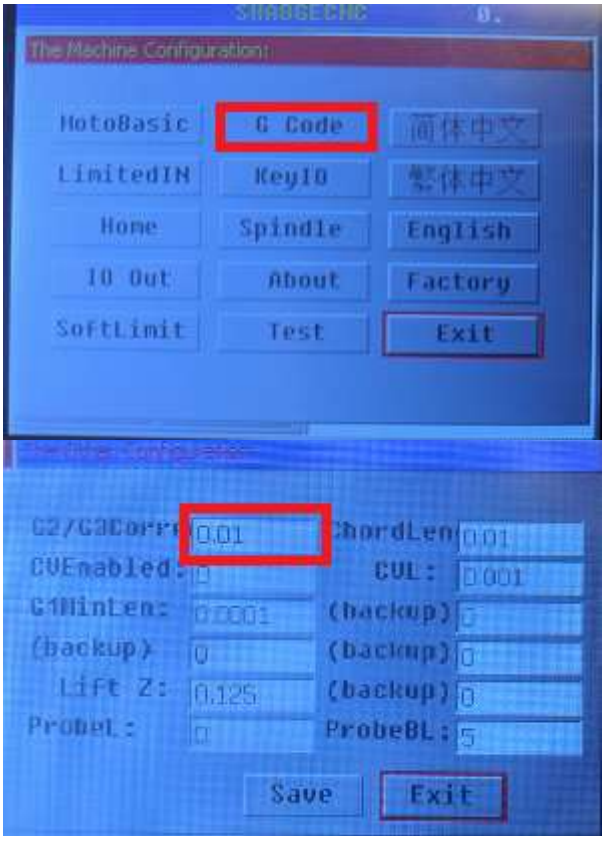
Setting allows you to set spindle parameters. The DTM series uses a non-encoded manual spindle. With that in mind there is no beneficial setting in this selection.

Advanced Settings: KeyIO



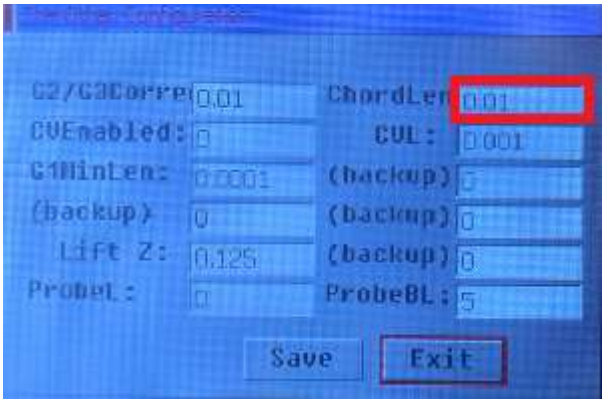
Allows you to specify what pin does what. We do not recommend changing this setting.

Advanced Settings: G-Code



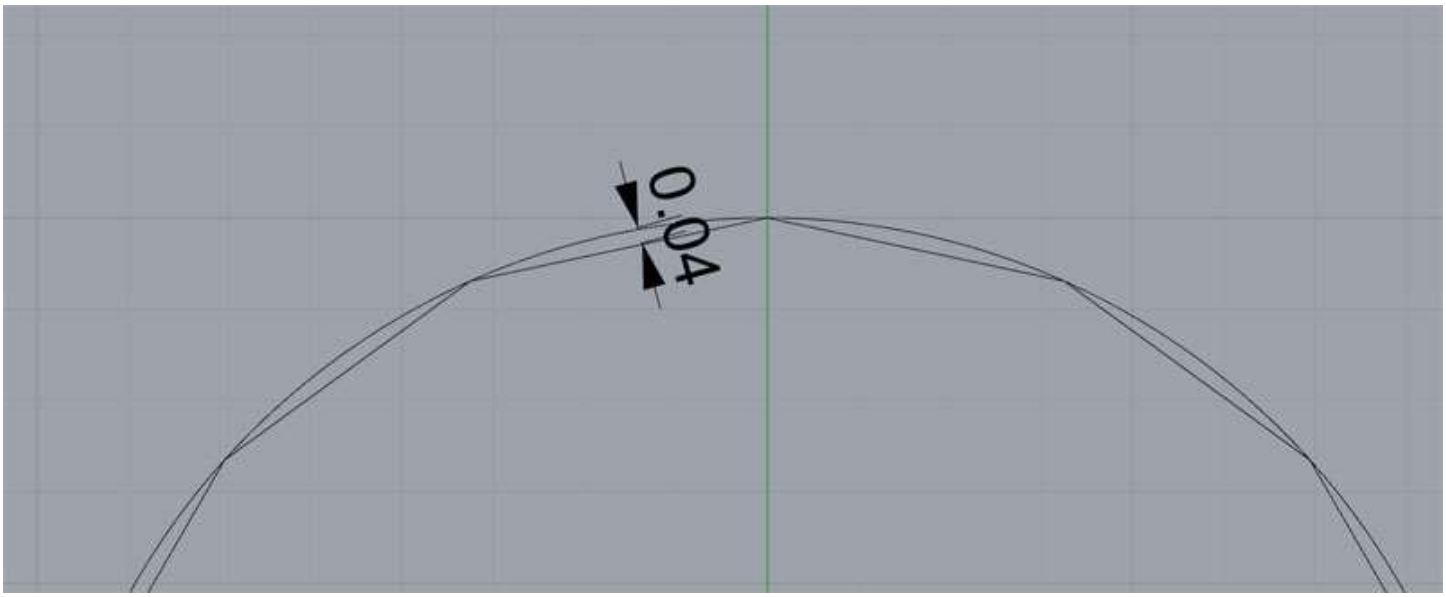
G2/G3 Correction: G2/G3 tolerance refers to the input G2/G3 after manual calculations or other calculations.

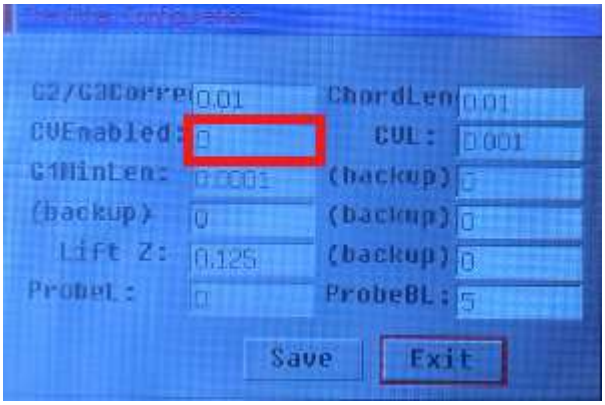
Because of the accuracy problems, so that circular arc center is inconsistent with the values given moment, there is a tolerance value, the system will be based on the given parameters, recalculate the best center coordinates, visible G2/G3 detailed instructions.



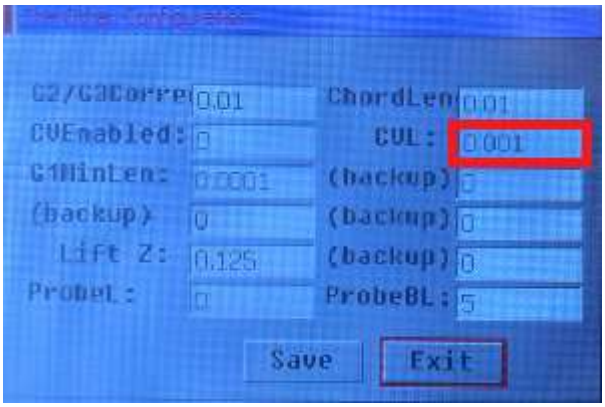
Chord Length: CAD and CAM programs will often simulate smooth flowing curves with a series of line segments. When this is the case, and it has to be the case for many kinds of curves because most CNC controllers only do lines and arcs and there are many more kinds of curves in the world, it's important to look at what "Chordal Tolerances" are in use. Note that your CAD and CAM programs may use alternate terminology, so follow along to understand the principles and then you'll know how to recognize which parameter to change in your software.

To understand Chordal Tolerance, think of simulating an arc with a series of line segments:

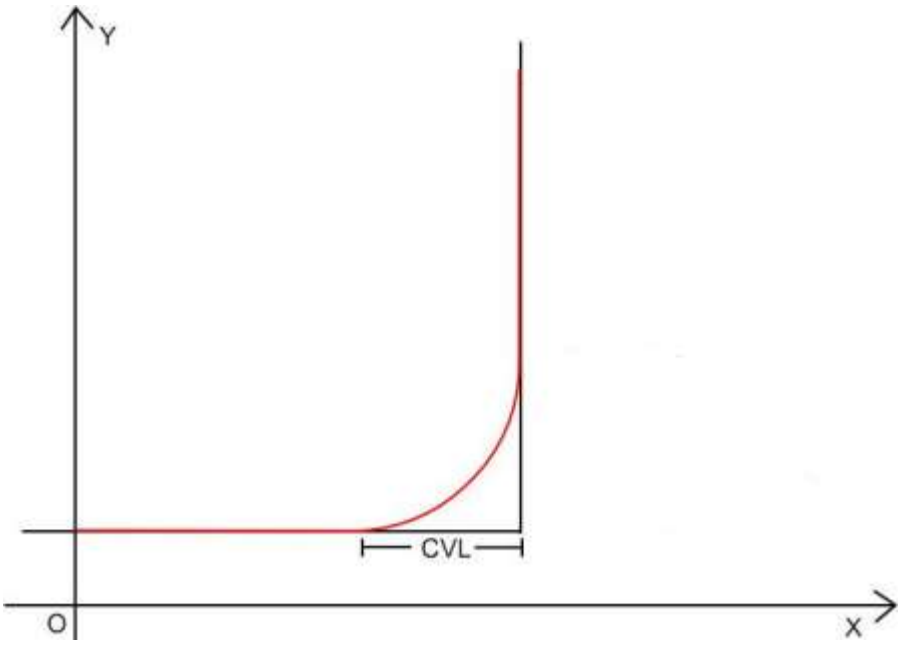


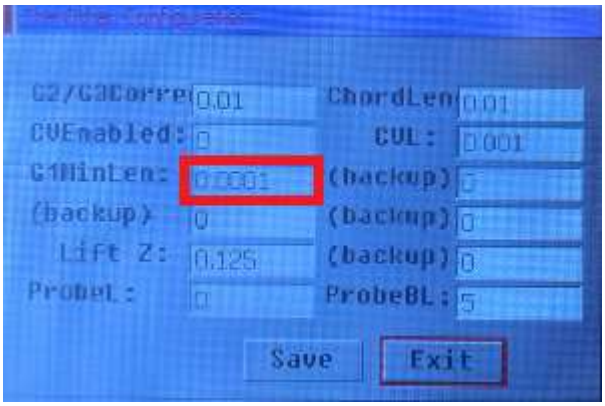


CVEnabled: Open CVL control

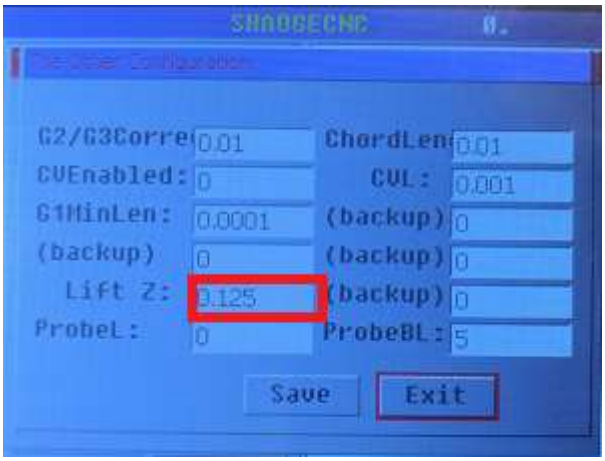


CVL: Corner length restrictions



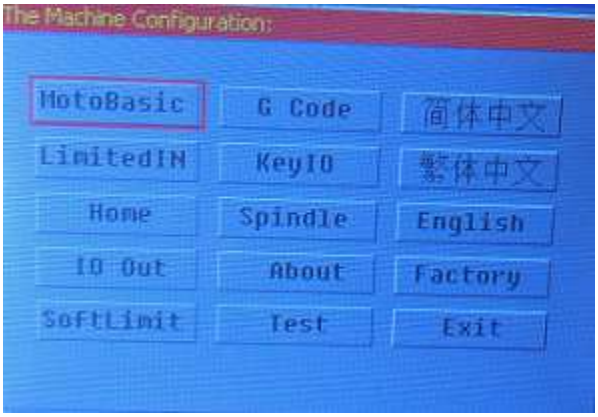


G01 minimum length: The minimum value allowed by the controller in a G1 movement, users can use the default value: 0.0001

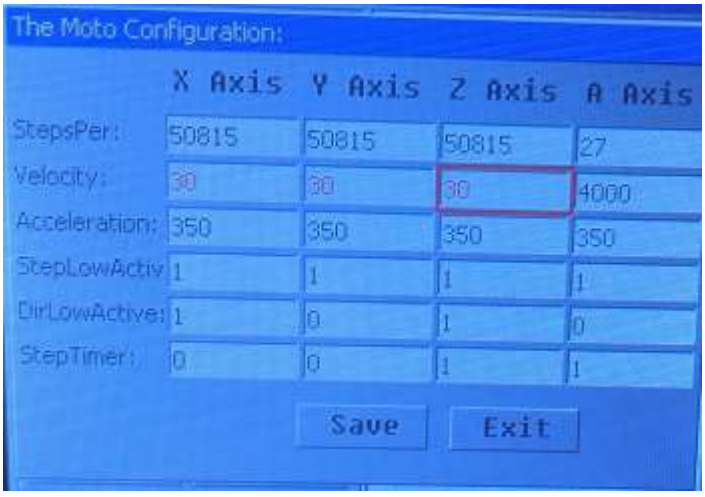


Lift Z: safety Z axis height. (homing movements, ect)

Advanced Settings: Motor



MotorBasic: motor settings such as step rotation, max velocity, axis direction ect.



StepsPer: Steps per rotation, if Axis is accuracy is off, adjust this setting to dial in.

Velocity: This is max movement rate, set in inches per minute.

Acceleration: How fast axis gets up to speed.