

Standalone Motion Controller DDCS V3.1 User's Guide

The Installation Size

182.5 mm



1 DDCS V3.1 Controller Introduction

1.1 Introduction of Product

Digital Dream has a 10 years history in the numerical control industry, specializing in the research, development and production of various CNC (Computer Numerical Control) systems from 2008. Digital Dream aims to combine high quality and high reliability with affordability. We produce 1 axis to 6 axes CNC system.

The **DDCS V3.1** is a 3 or 4 axis motion controller for stepper and servo systems. DDCS V3.1 is updated from DDCS V1.1 and DDCS V3.1. We are very proud of this product, it combines great power with a tiny footprint and is easy to use. After a very short time you will be familiar with the functions and this manual will help you. The highest output pulse per axis is 500KHz. The pulse width is adjustable (refer to driver manual). The control period of each position is only 4 milliseconds. This provides high control precision for stepper motors and servo motors.

The **DDCS V3.1** numerical control system adopts the ARM+FPGA design framework. ARM controls the human-computer interface and code analysis and the FPGA provides the underlying algorithms and creates the control pulse. This guarantees reliable control and easy operation. The internal operating system is Linux based.

The panel layout structure of the DDCS V3.1 is very rational to save space. All operations are controlled by only 17 keys and a comprehensive G code set is supported.

The **DDCS** can be used for many styles and types of CNC machines. Lathes, Routers, Pick&Place and Mills are just a few examples. It operates as a Stand Alone system without the need of a computer. This guarantees high precision, accuracy and reliability. The interface, even very comprehensive, can be learned in a very short time.

1.2 Performance parameter of the DDCS V3.1

- 1) 16 opto isolated digital inputs, 3 opto isolated digital outputs;
- 2) Upgrade algorithm, support soft interpolation, fixed arc interpolation bug of the old version;
- 3) Analog spindle control 0-10V spindle control (can be modified as PWM output);
- 4) 3-4 axis motor Control. Differential Pulse and direction output signal, Max. 500Khz per axis;
- 5) ARM9 main control chip, FPGA core algorithm chip;
- 6) 5 inches TFT screen, resolution ratio: 480x272, 17 operation keys;
- 7) 24VDC power input, minimum Current is 0.5A;
- 8) USB flash disk support for G code file input, no size limited of the G-code file ;
- 9) 1GB internal memory;
- 10) Support standard MPG;
- 11) Jog function for each axis (continuous, step, defined distance);
- 12) Support the operation of quickly specify the running position;
- 13) Support for "Power Cut" recovery. Data is automatically saved;
- 14) Support the origin and Limit share the same Input ports;
- 15) The controller only support NPN type limited switch.

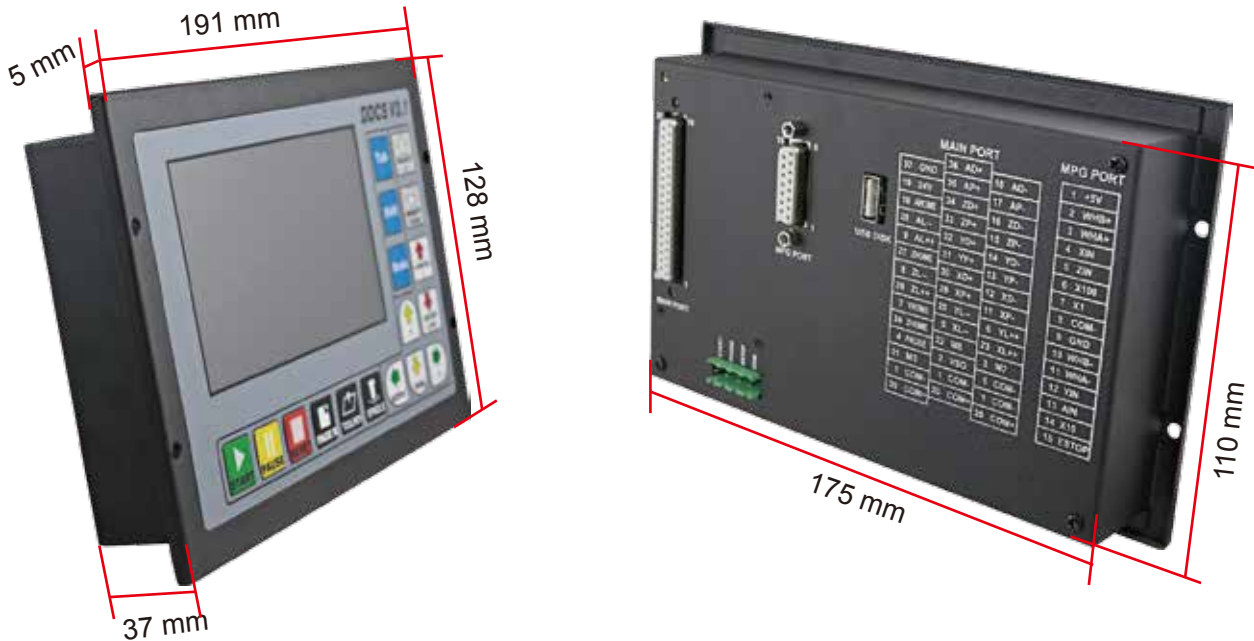
1.3 Appearance, Structure and Size of Product

The **DDCS V3.1** is a small box that can fit in a window of a small control box or control cabinet. Four locking hooks fix this controller from the frame. The dimension you find in picture 1-1 and picture 1-2.

The front panel is 191mm*128mm*5mm;

The main body is 191mm*128mm*37mm;

To mount the unit in an equipment cabinet, cut the hole 182.5mm*59mm



Picture 1-1 DDCS V3.1 Front and back view and dimensions



Picture 1-2 DDCS V3.1 Rear view and dimensions

The front panel consists of 17 user keys and the 5" (480*272) LCD.



Picture1-3 Front panel

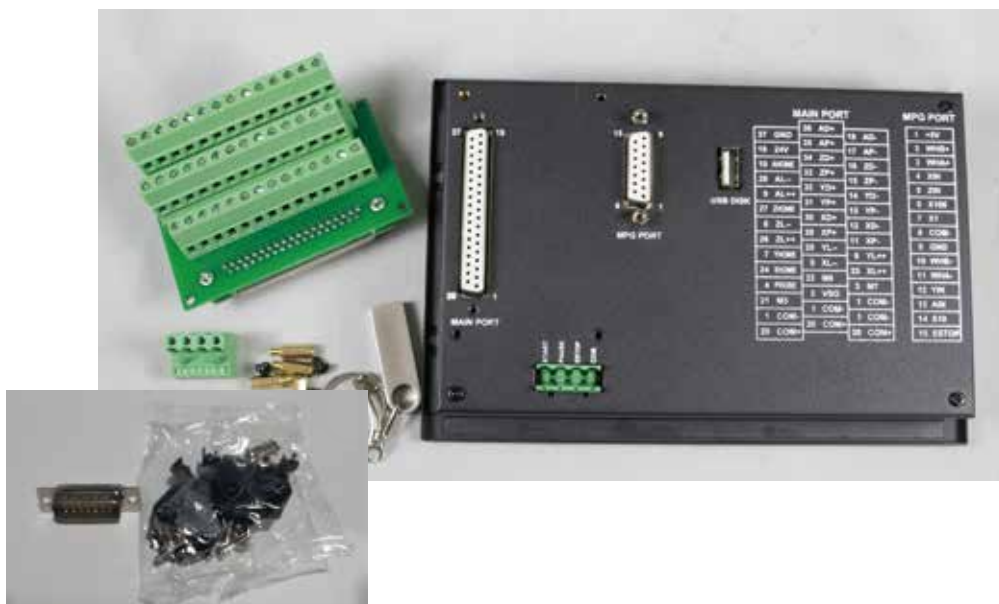
At the back side of the controller, there are USB Disk interface, MPG Port, Main Port and external Start/Pause/Estop interface.

In order to make convenient for the connection, we also apply the 3 layers wiring terminal for main port.

We also supply a DB-15 Ma plug for MPG connection.

The 8 screws are to fix the wiring terminal and controller.

The U-disk is for the transfer of the G-code file.



1.4 Explanation of Abbreviations

When operating the DDCCS, the users will come across some English abbreviations. Here a list with explanations

FRO: Feed Rate Override

SRO: Spindle Rate Override

SRJ: Jog Speed Setting

F: Feed rate, unit is mm/min

S: Spindle Speed, unit rev/min.

X: The coordinate code of the X axis.

Y: The coordinate code of the Y axis.

Z: The coordinate code of the Z axis.

A: The coordinate code of the A axis

BUSY: The system is busy. You still can adjust FRO and SRO

READY: READY mode, any operation can be done

RESET: Reset mode, controller is in "OFF" mode, no operation can be performed

CONT: Continuous mode, each axis can be manually jogged with the arrow keys

Step :Manual Step Mode, each axis can be jogged in defined steps

MPG: MPG mode. Operate the machine with the MPG (Manual Pulse Generator)

AUTO: Run G code. Auto is showing when file is processing

1.5 Notes and Warnings



Keep away from exposure to moisture or water. This product contains sophisticated electronics and must not get wet.

Wiring warning: the IO input terminal of this controller supports equipment with source power (such as Inductive Proximity Switch). When using this kind of equipment, pay attention to the polarity. Avoid the +terminal to be connect with GND. This controllers has analog output for spindle control (0-10V). Please avoid this terminal to ever connect with GND as damage to the controller may occur.



Operation warning. Please observe all security measures when operating the machine. The ESTOP must be connected and properly labelled. In case of a problem, press the E-stop at once to avoid damage to humans, animals and the equipment.



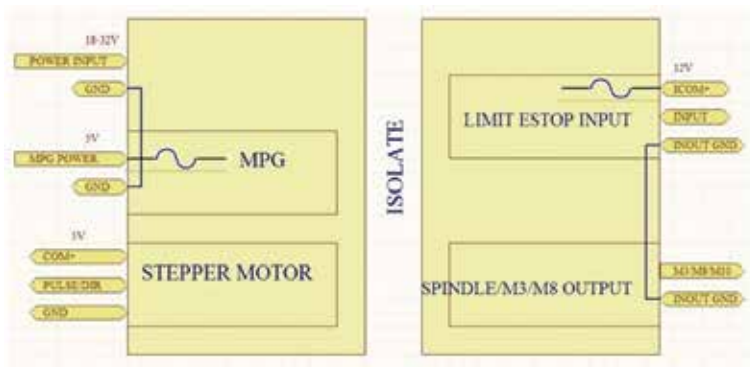
High voltage danger. The DDCCS is connected to 18-32V DC. Obey and follow the electricity safety rules of your country when connecting this equipment.

2 Wiring

2.1 Power supply explanation

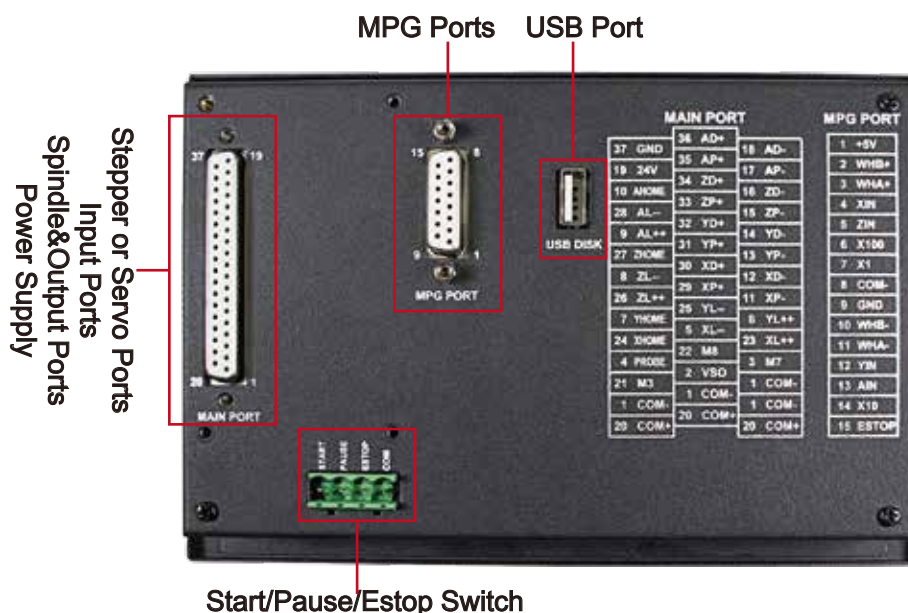
In general, the power supply of industrial control's equipment products are complex. They have many different ground levels. The internal power structure of this product is as follows:

See picture 2-1. The Master Power input and MPG module and stepper control module have the same ground. Limit,ESTOP and other input modules as well as the spindle speed control output /M3/M8/M10 and other output modules have the same ground, which use optical isolation. The Limits, E-STOP and other input modules are connected with the same positive. The controller provides 12V as the common + port, without the requirement of the external power source. As for the spindle port, take the output ground for references and the 0-10V adjustable voltages to adjust the spindle speed (refer to spindle VFD manual). The M3/M8/M10 digital output ports pull to ground. You can connect an external relay with up to 50mA direct to 12V+ and the M connector (Solid State relays usually pull between 15 and 20mA)



Picture 2-1 Power supply structure

2.2 Product Wiring Overview



Picture 2-2 Wiring and Ports

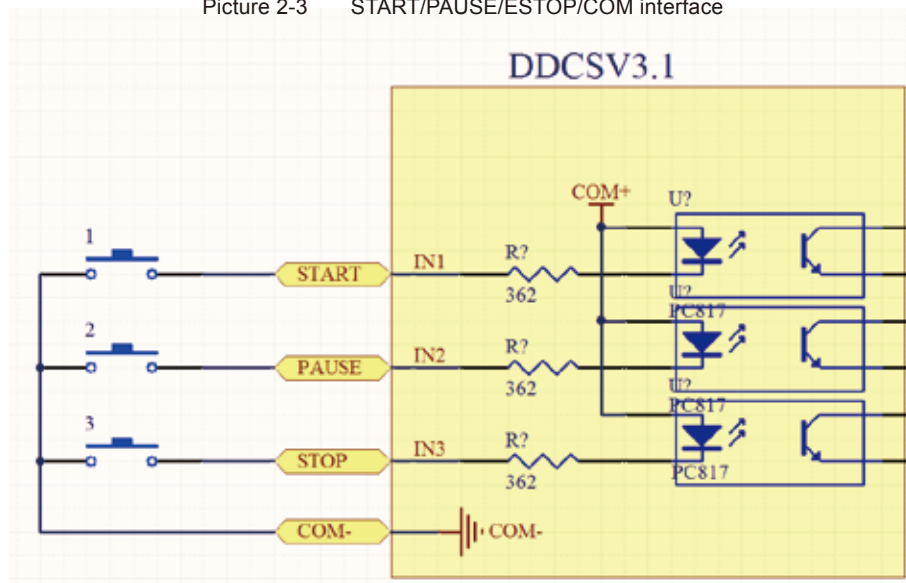
As the picture shows, the wiring section of the controller has Input Ports, Spindle&Output Ports, stepper/Servo control step and direction output, MPG Port, USB Port and Power supply Port.

2.3 START/PAUSE/ESTOP Switch Wiring

As Picture 2-3 shows, the power interface, there is a screw terminal for connection. The marks are the “START”/”PAUSE”/”ESTOP” and “COM” for external switches. And Picture 2-4 is the circuit drawing for the connection.



Picture 2-3 START/PAUSE/ESTOP/COM interface



Picture 2-4 Circuit drawing of START/PAUSE/ESTOP/COM

2.4 USB Wiring

This USB port is the standard USB A-type. A 50cm USB extension cord with installation plug is supplied with the controller. See sketch diagram picture 2-5 for reference.

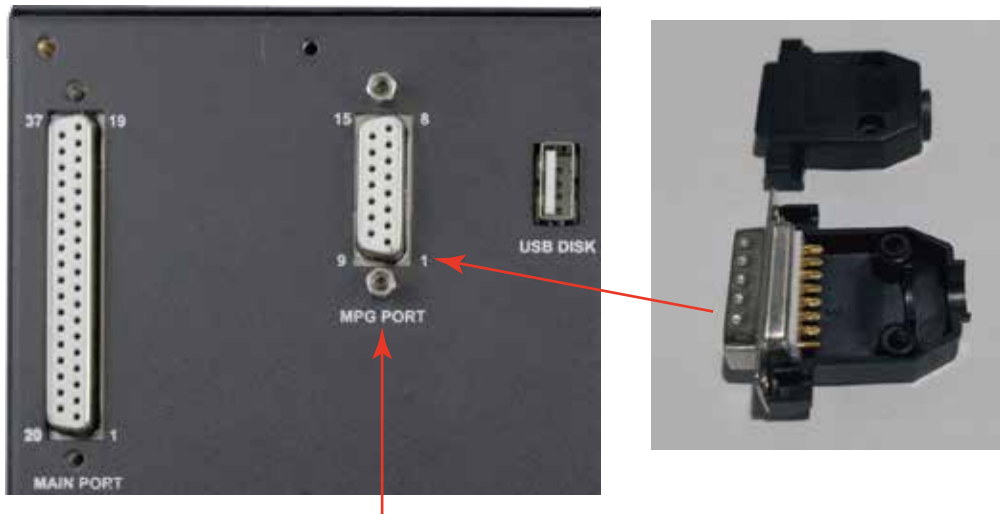


Picture 2-5 USB interface

2.5 MPG Port

The MPG port is shown in Picture 2-6. It is the DB15 Female terminals next to the USB port.

The users need to weld the MPG cables into the DB15 Male terminal, and plug-in to the MPG port of the controller MPG port.



Picture 2-6 MPG port and accessory connector for it

The MPG port has 15 pins, see Table 2-1 for reference. See Table 2-2 and table 2-3 for the wiring.

Pin No.	Pin Mark	Definition	Notes
1	+5V-W	MPG Power Supply 5V Positive	Exclusive Power supply Positive of MPG, which can restore the fuse connection with a 200MA of the system power supply.
2	WHB+	MPG B phase positive	MPG B differential input positive terminal
3	WHA+	MPG A phase positive	MPG A phase differential input positive terminal
4	X-IN	Select switch of X axis	Connect with GND, indicates selecting X axis, open indicates no selecting
5	Z-IN	Select switch of Z axis	Connect with GND, indicates selecting Z axis, open indicates no selecting
6	X100	Select switch 100 X	Connect with GND, indicates selecting 100 X, open indicates no pulse
7	X1	Select switch 1 X	Connect with GND, indicates selecting 1 X, open indicates no pulse
8	COM-	Switch Signal common terminal	the switch signal common terminal, which can restore the fuse connection with a 200MA of the system power supply.
9	GND	MPG Power supply Ground	MPG power supply ground
10	WHB-	MPG B phase negative	MPG B phase differential input negative terminal
11	WHA-	MPG A phase negative	MPG A phase differential input negative terminal
12	Y-IN	Select switch of Y axis	Connect with GND, indicates selecting Y axis, open indicates no selecting
13	A-IN	Select switch of A axis	Connect with GND, indicates selecting A axis, open indicates no selecting
14	X10	Select switch 10 X	Connect with GND, indicates selecting 10 X, open indicates no pulse
15	ESTOP	ESTOP of MPG	Connect with GND, indicate ESTOP is in effect. Open indicates Estop is invalid.

Table 2-1 DDCS's MPG Port



DDCS Wiring Pin	MPG Function	MPG Pin Mark	MPG Output Cable Color
+5V-W	Power Supply +	Vcc(+5V)	Red
WHB+	B Phase +	B+	White
WHA+	A Phase +	A+	Green
X-IN	X Axis	X	Yellow
Z-IN	Z Axis	Z	Brown
X100	X100 Ratio	X100	Orange
X1	X1 Ratio	X1	Grey
COM-	Enable Switch	COM	Black/Orange
GND	Power Supply -	GND	Black
WHB-	B Phase -	B-	Purple/Black
WHA-	A Phase -	A-	Purple
Y-IN	Y Axis	Y	Black/Yellow
A-IN	A Axis	A	Black/Brown
X10	X10 Ratio	X10	Black/Grey
ESTOP	ESTOP	ESTOP	Blue

Table 2-2 DDCS Wiring with standard MPG

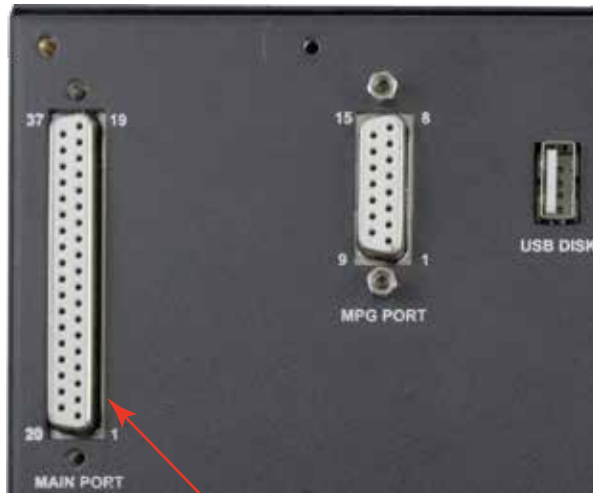
Note: If you want to use the single-terminal MPG (there is no A-B-MPG), please refer to table 2-3 for reference. As for the unlisted MPG, please take the differential MPG wiring mode.

DDCS Wiring Pin Mark	MPG Pin Mark and Color	
WHA+	A+	Green
WHA-	0V	Black
WHB+	B+	White
WHB-	0V	Black

Table 2-3 DDCS Wiring with Single-terminal MPG

2.6 Main Port Wiring

Picture 2-7 shows the main port position:



Picture 2-7 Main Port

We also supply a wiring terminal to fit the 37 female pins, which makes it convenient for the wiring. Please note the following photo. At the terminal's four corners, there are screws to make the terminal locked onto the controller.

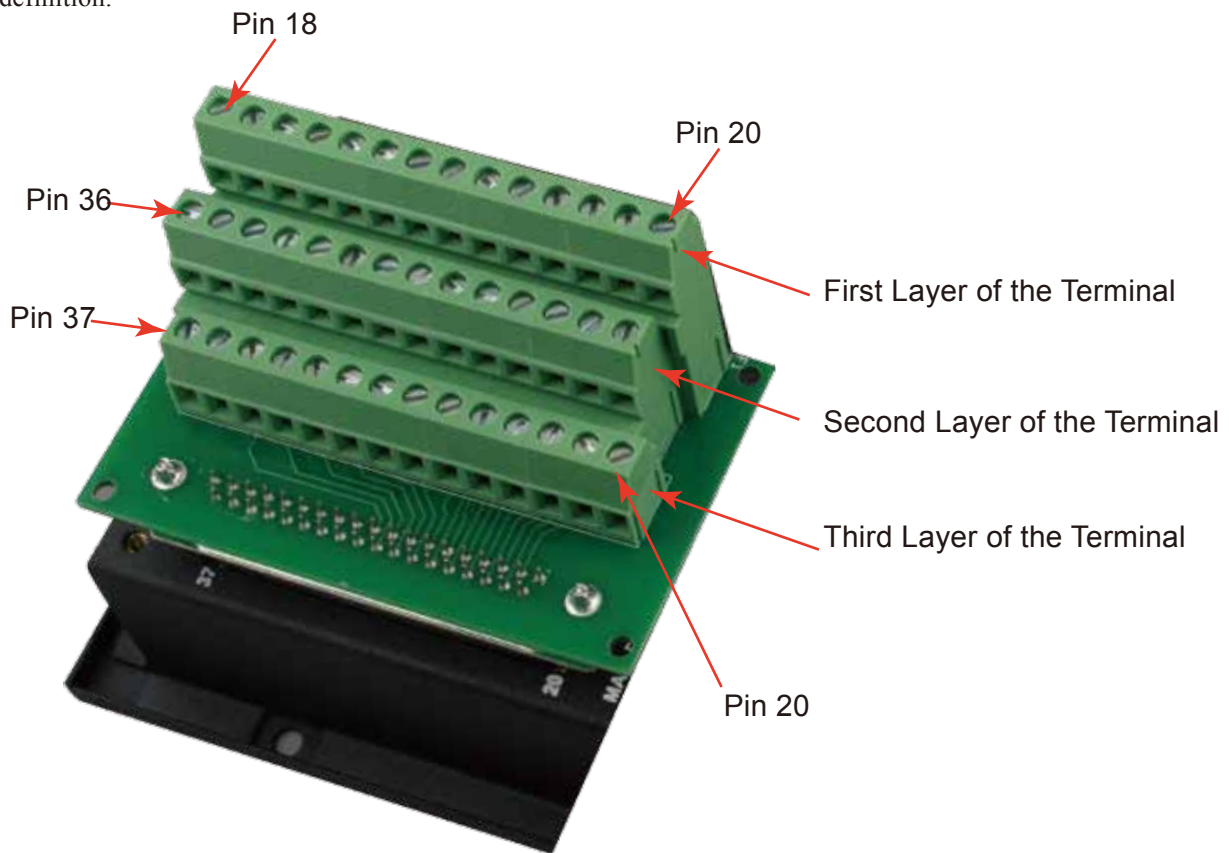


Picture 2-8 Main Port with wiring terminal

There are 3 layers of the Wiring Terminal. Pls note the following photo, which showed the pin No.s and Pin Mark and definition. It include:

- 1) Stepper/Servo Output Ports;
- 2) The Spindle Control Output Ports;
- 3) The E-stop, Limit, Home and Probe and other Inputs ports;
- 4) 24V DC Power Supply ports for the Controller;
- 5) 24V DC Power Supply ports for the I/O Unit.

Picture 2-9 shows the 3-layers and the orders of the pin no. Table 2-4 and 2-5 shows the Pin mark and definition.



Picture 2-9 3-Layers wiring terminal

First Layer of the Terminal													
PIN 18	PIN 17	PIN 16	PIN 15	PIN 14	PIN 13	PIN 12	PIN 11	PIN 6	PIN 23	PIN 3	PIN 1	PIN 1	PIN 20
AD-	AP-	ZD-	ZP-	YD-	YP-	XD-	XP-	YL++	XL++	M8	COM-	COM-	COM+

Second Layer of the Terminal													
PIN 36	PIN 35	PIN 34	PIN 33	PIN 32	PIN 31	PIN 30	PIN 29	PIN 25	PIN 5	PIN 22	PIN 2	PIN 1	PIN 20
AD+	AP+	ZD+	ZP+	YD+	YP+	XD+	XP+	YL--	XL--	M10	VSO	COM-	COM+

Third Layer of the Terminal													
PIN 37	PIN 19	PIN 10	PIN 28	PIN 9	PIN 27	PIN 8	PIN 26	PIN 7	PIN 24	PIN 4	PIN 21	PIN 1	PIN 20
GND	24V	AHOME	AL--	AL++	ZHOME	ZL--	ZL++	YHOME	XHOME	PROBE	M3	COM-	COM+

Table 2-4 Main Port Pin No. and Mark

First Layer of the Terminal		
Pin No.	Pin Mark	Definition
PIN 18	AD-	Direction Signal Negative Output of A Axis (5V)
PIN 17	AP-	Pulse Signal Negative Output of A Axis (5V)
PIN 16	ZD-	Direction Signal Negative Output of Z Axis (5V)
PIN 15	ZP-	Pulse Signal Negative Output of Z Axis (5V)
PIN 14	YD-	Direction Signal Negative Output of Y Axis (5V)
PIN 13	YP-	Pulse Signal Negative Output of Y Axis (5V)
PIN 12	XD-	Direction Signal Negative Output of X Axis (5V)
PIN 11	XP-	Pulse Signal Negative Output of X Axis (5V)
PIN 6	YL++	Limited Signal Input at Y++ direction
PIN 23	XL++	Limited Signal Input at X++ direction
PIN 3	M8	Start Cooling Signal Output for Spindle
PIN 1	COM-	All between "COM+"s are conducting.All between "COM-"s are conducting. Between COM+ and COM- there is 24VDC power.COM+ and COM- is the power supply for I/O Unit,for example the relay.COM+ is Positive side and COM- is Negative side.
PIN 1	COM-	
PIN 20	COM+	
Second Layer of the Terminal		
Pin No.	Pin Mark	Definition
PIN 36	AD+	Direction Signal Positive Output of A Axis (5V)
PIN 35	AP+	Pulse Signal Positive Output of A Axis (5V)
PIN 34	ZD+	Direction Signal Positive Output of Z Axis (5V)
PIN 33	ZP+	Pulse Signal Positive Output of Z Axis (5V)
PIN 32	YD+	Direction Signal Positive Output of Y Axis (5V)
PIN 31	YP+	Pulse Signal Positive Output of Y Axis (5V)
PIN 30	XD+	Direction Signal Positive Output of X Axis (5V)
PIN 29	XP+	Pulse Signal Positive Output of X Axis (5V)
PIN 25	YL--	Limited Signal Input at Y-- direction
PIN 5	XL--	Limited Signal Input at X-- direction
PIN 22	M10	Start Lubrication Signal Output for Spindle
PIN 2	VSO	Speed output (0-10V) VSO Signal Output
PIN 1	COM-	All between "COM+"s are conducting.All between "COM-"s are conducting. Between COM+ and COM- there is 24VDC power.COM+ and COM- is the power supply for I/O Unit,for example the relay.COM+ is Positive side and COM- is Negative side.
PIN 20	COM+	
Third Layer of the Terminal		
Pin No.	Pin Mark	Definition
PIN 37	GND	Power Supply Ground
PIN 19	24V	Power Supply for Controller 24VDC Input Positive Side
PIN 10	AHOME	Home Signal Input of A Axis
PIN 28	AL--	Limited Signal Input at A-- direction
PIN 9	AL++	Limited Signal Input at A++ direction
PIN 27	ZHOME	Home Signal Input of Z Axis
PIN 8	ZL--	Limited Signal Input at Z-- direction
PIN 26	ZL++	Limited Signal Input at Z++ direction
PIN 7	YHOME	Home Signal Input of Y Axis
PIN 24	XHOME	Home Signal Input of X Axis
PIN 4	PROBE	Probe Signal Input
PIN 21	M3	Start Spindle Signal Output
PIN 1	COM-	All between "COM+"s are conducting.All between "COM-"s are conducting. Between COM+ and COM- there is 24VDC power.COM+ and COM- is the power supply for I/O Unit,for example the relay.COM+ is Positive side and COM- is Negative side.
PIN 20	COM+	

Table 2-5 Main Port Pin No. and definition

2.6.1 Spindle control output

PIN3(M8),PIN22(M10),PIN2(VSO) and PIN21(M3) is for spindle control output.The spindle control output terminal offers connections for Start and Stop of the Spindle (M3/M5), Start/Stop of Cooling (M8/M9) and Start/Stop of Lubrication (M10/M11). These three output terminals are signals open to ground. The highest electric current can be absorbed is 50mA. The speed controlling output terminal can output 0-10V. It can adjust the speed of the spindle motor by sending the voltage between 0 and 10V to the VFD according the the Spindle Speed Setting.

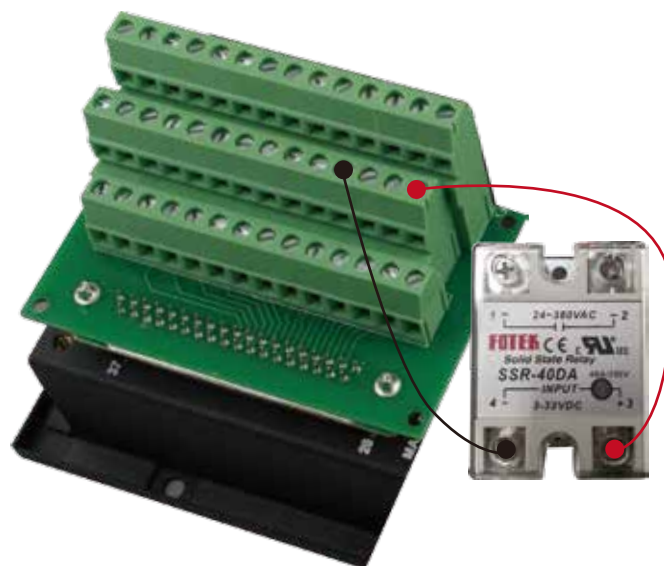
Controlling the speed of a spindle with a VFD (variable frequency drive) only needs the Start/Stop signal and the 0-10V signal to control the frequency.

The following table 2-6 shows the wiring with Sunfar VFD:

	
DDCS V3.1 Wiring pin	SUNFAR E300
Speed output (0-10V) PIN2(VSO)	AI
Start and stop of spindle PIN21(M3)	FWD
Output ground	CM

Table 2-6 **DDCS** and VFD wiring

PIN3(M8),PIN22(M10) and PIN21(M3) is also can be used for OUTPUT ports.For example,it can be used for a Relay output port.For example the picture 2-10 shows the wiring methods:



Picture 2-10 Wiring Methods with Relay

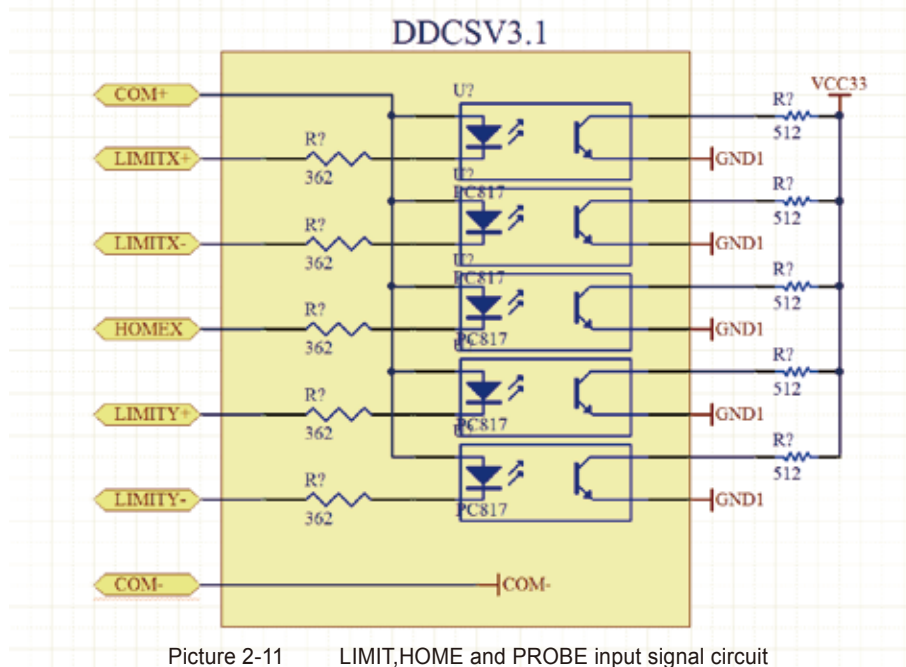
2.6.2 Limit, Home and Probe Inputs, and the Power for the Input

PIN6(YL++), PIN23(XL++), PIN25(YL--), PIN5(XL--), PIN28(AL--), PIN9(AL++), PIN8(ZL--), PIN26(ZL++) are the Limit ports.

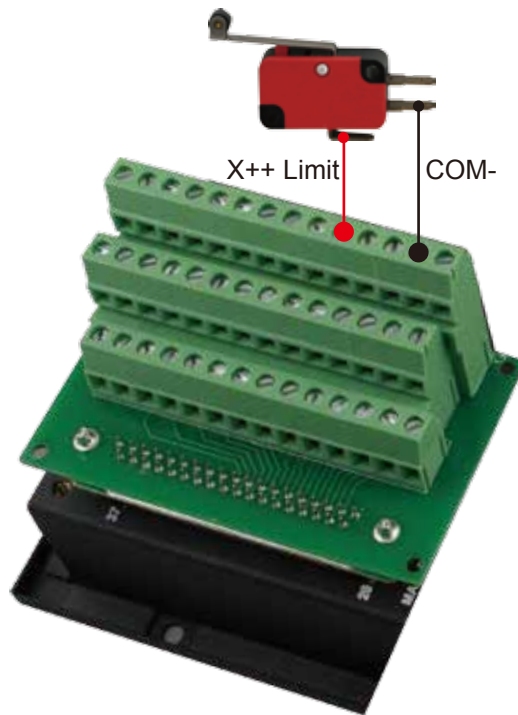
PIN10(AHOME), PIN27(ZHOME), PIN7(YHOME), PIN24(XHOME) are the Home Ports.

PIN4(PROBE) is the Probe Port.

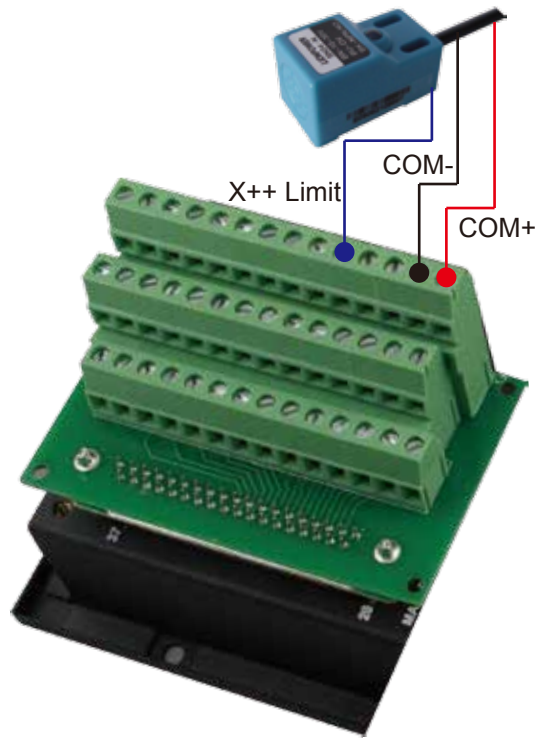
The following wiring pictures and circuit pictures will show the connection of the Limit, Home and Probe Wiring.



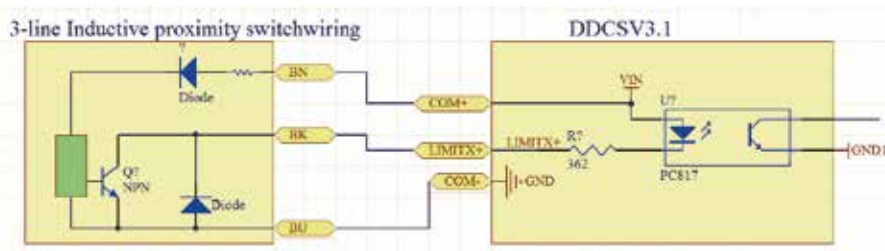
Picture 2-11 LIMIT, HOME and PROBE input signal circuit



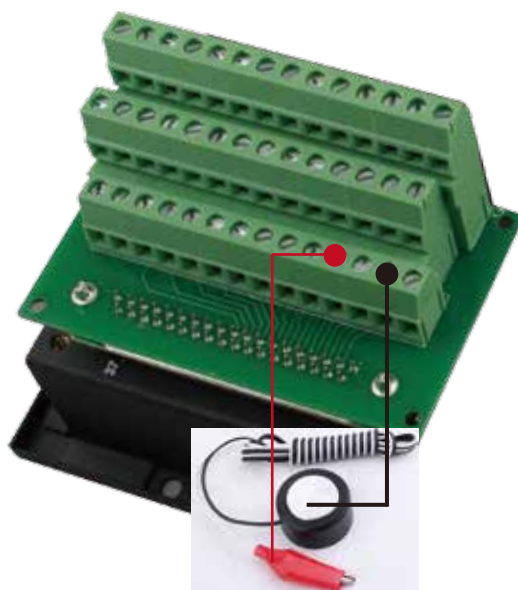
Picture 2-12 The Limit wiring at X++ direction with mechanical limited switch



Picture 2-13 The Limit wiring at X++ direction with 3-line proximity switch



Picture 2-14 The circuit of 3-line Inductive proximity switch



Picture 2-15 The Probe Wiring

2.6.3 Stepper/Servo Control Output

The stepper/servo control output, we cite differential Pulse and Direction output method, Max. 500Khz per axis. DDCS V3.1 there is 3 or 4 axis for option

PIN 18 (AD-), PIN 36 (AD+), PIN 17 (AP-), PIN 35 (AP+) is A Axis Control Output Pins;

AD- means the Direction signal negative output for A axis, AP+ means the Direction signal positive output for A axis, AP- means the Pulse signal negative output, AP+ means the Pulse Signal positive output.

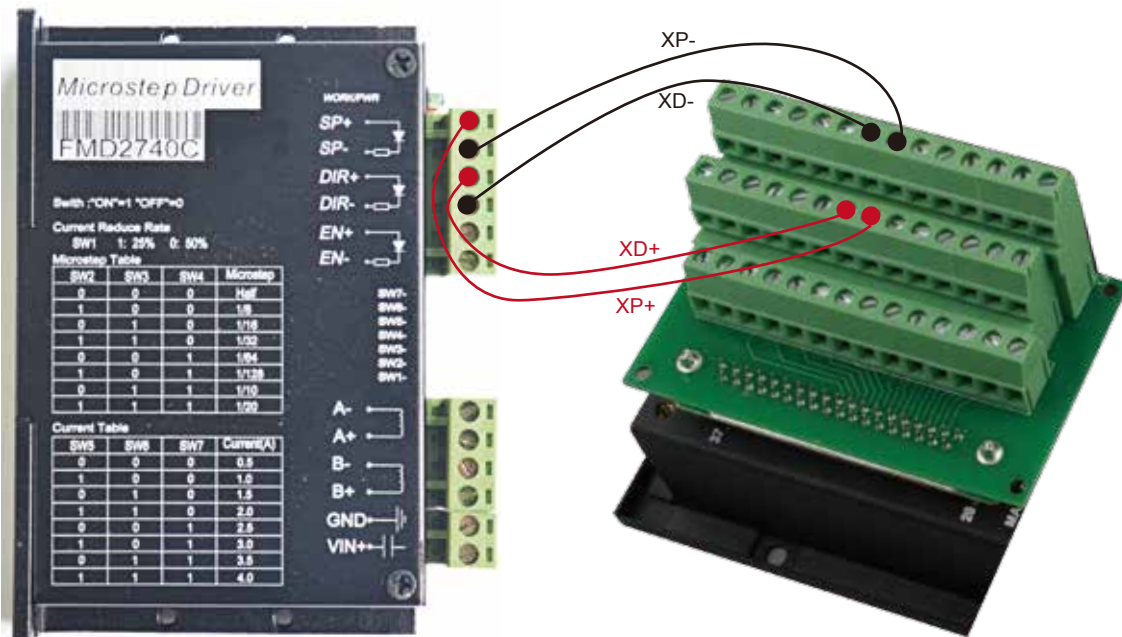
The Pulse and Direction signal output voltage is $\pm 5V$.

PIN 16 (ZD-), PIN 34 (ZD+), PIN 15 (ZP-), PIN 33 (ZP+) is Z Axis Control Output Pins;

PIN 14 (YD-), PIN 32 (YD+), PIN 13 (YP-), PIN 31 (YP+) is Y Axis Control Output Pins;

PIN 12 (XD-), PIN 30 (XD+), PIN 11 (XP-), PIN 29 (XP+) is X Axis Control Output Pins.

The following picture 2-16 is the example of stepper driver wiring as X axis.



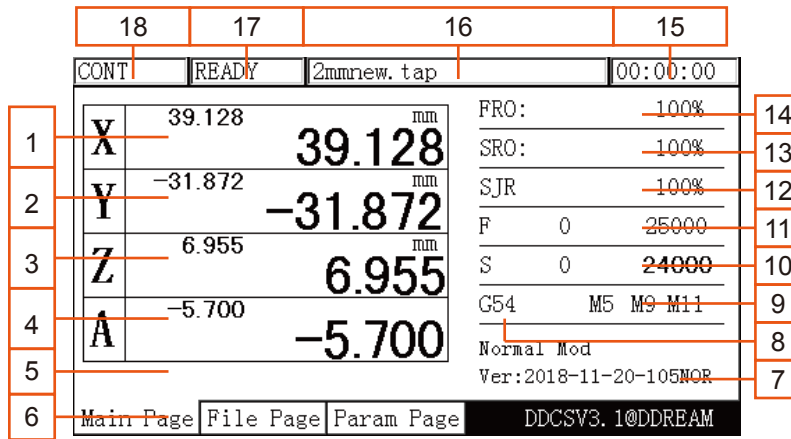
Picture 2-16 The Stepper driver wiring as X Axis

3 Software Operation and Parameter Settings

3.1 Interface description

The software interface contains 3 pages. Main page, File page and Configuration page.

3.1.1 Main page



Picture 3-1 Main page

The picture 3-1 shows the Main page of the **DDCS**. It is divided into status column, coordinate display column, basic parameter column, and notification column. In total, it is divided into 18 sections in detail. Here the detailed description of the 18 sections :

1、 X Coordinate

This column shows the current coordinate value of X. The display range is -99999.999~+99999.999, the minimum JOG value is 0.001.

2、 Y Coordinate

This column shows the current coordinate value of Y. The display range is -99999.999~+99999.999, the minimum JOG value is 0.001.

3、 Z Coordinate

This column shows the current coordinate value of Z. The display range is -99999.999~+99999.999, the minimum JOG value is 0.001.

4、 A Coordinate (This section has no definition in the 3-axis)

This column shows the current coordinate value of A. The display range is -99999.999~+99999.999, the minimum JOG value is 0.001.

5、 Current Operation

When the controller runs the G code file, it will show the current operation line number and coordinates. When the operation state is READY, it will show nothing

6、 Page

The page shows the current page. This controller has 3 pages, Main Page, File Page and Configuration Page. Press Page button to move between the Pages.

7、 Operation Window

This message window switches between 3 displays. It shows the prompt message of several keys and the 2nd (second function)

The message displayed while in normal state is: Normal Mode.

The message displayed of the 2nd function status is:

X-: goto, Y-: zero, Z-: home, A-: probe, Pause: goto break

If you now click X-, the machine will move to Zero. If you click A-, the probe function will be activated. If you click Y-, all coordinates will be set to Zero. If you click Z-, the machine will home. If you click Start, the Start Line window appears and you can enter the G-code line you want to start from. Click on Pause to enter the breakpoint CONT Callback Function.

Tip:

You need to click these functions twice to activate them (first click is “select”, second click is “activate”).

Tip:

When you are in an Editing Window, you can insert values by using the following keys:

X-: moves the cursor left

X+: moves the cursor right

Y-: decrease the value

Y+: increases the value

Z-: Enter

Z+: Cancel

8 Coordinate System

With the CR8-500 control panel it is very easy to control your Machine Coordinates and Work Offset Coordinates. Click FRO/SRO/SJR (from now on only called FRO) 6 times until the coordinate system is highlighted. Here you can display G54 to G59 and MACH (Machine Coordinates) by clicking A+ and A-

Tip

After selecting a function with the FRO key you use the A+ button to Select and the A- button to Modify the value.

If the function can be edited, the Editing Window will open and you can edit with:

X-: moves the cursor left

X+: moves the cursor right

Y-: decrease the value

Y+: increases the value

Z-: Enter

Z+: Cancel

9、 Status of M3/M5,M8/M9 or M10/M11

M3/M5: Start/Stop Spindle

M8/M9 : Start/Stop of Cooling

M10/M11: Start/Stop of Lubrication

10、 Speed of spindle

S stands for Spindle Speed. Click FRO till S is highlighted,click A- to modify and edit the value you want.

The display shows two values. The left value is the real time Spindle Speed, the right value shows the default Spindle Speed. The Default Spindle Speed can be changed, use the A- key to modify.

11、 Feed speed

F stands for Feed Speed. Click FRO till F is highlighted, click A- to modify and edit the value you want.

The display shows two values. The left value is the real time Feed Speed, the right value shows the default Feed Speed. The Default Feed Speed can be changed, use the A- key to modify and edit.

12、 SJR

SJR controls the jogging of the machine. Click FRO till SJR is highlighted.

First Option: MODE

Check window 18 and you can see what Jog Mode you are in. By clicking MODE you can change Jogging to Continuous, Step or to MPG, Window 18 will display this function.

When in Cont Mode, A+ and A- can adjust the speed in 10% increments

When in Step Mode, A+ and A- can change from 0.01mm to 0.1mm to 1mm and to 10mm

When in MPG mode you can use the MPG to jog the machine

Second Option: Jog a defined distance

13、 SRO

SRO controls the Spindle Speed. Click FRO till SRO is highlighted, use A+ and A_ to adjust the Spindle Speed in 10% increments

14、 FRO

FRO controls the Feed Speed. Click FRO till FRO is highlighted. Use A+ and A- to adjust the Feed Speed in 10% increments

15、 Working time

This column shows the processing time of the G code operation. Time keeping is halted during Pause

16、 Processing file

This column shows the name of the processing files. In the formal situation, it only shows the filename. Under the situation of CONT adjust, it will also show the content of the file.

17、 Operating Status

This column shows the operating state. The status and implications can be displayed as follows:

Busy: Operation is running

Reset: Reset flashing = controller not active. To activate the controller click Reset

READY: Ready state. Controller is ready and all operations can be performed

18、 Feed status

This window shows the feed status of Jogging and File Processing.

AUTO: displayed while processing and executing the G code file

CONT: indicates Jog CONTINUOUS. You can Jog manually with the “-” or “+” keys of X Y Z and A. A short click will move the axis in the defined step, a long click will move the axis till you let go

Step: Jogging in Step Mode

3.1.2 File Management Page

Click the Page button once and the File Management Page will open

Name		Size	Time
..	[DIR]		1970/01/09 08:25
BMF0. bmp		261174	1970/01/01 00:00
2mmnew. tap		1525367	2018/12/23 10:39
ball1. nc		1653221	2017/12/27 10:26

F1-COPY | F2-PASTE | F3-EDIT | F4-NAME | INS-NEW | DEL-DEL

Main Page | File Page | Param Page | DDCSV3.1@DDREAM

Picture 3-2 File management page

As the picture 3-2 shows, the file management page can be divided into 4 columns

- 1、 Change Directory
- 2、 File list of current Directory
- 3、 Files size column Shows file size in byte
- 4、 Modification time and date

3.1.3 Configuration Page

Click the Page button once and the File Management Page will open:

No.	Param Name	Value	Unit
--- [Top parameters]			
5	minimum log radius of 4axis machini	5.000	mm
6	A axis rotate reference axis	not rotate	
104	A axis optimal path when G0 run	No	
--- [Motor parameters]			
33	Motor start speed	150.000	mm/min
34	X axis pulse equivalency	1280.000	pulse/mm
35	Y axis pulse equivalency	1280.000	pulse/mm
36	Z axis pulse equivalency	3200.000	pulse/mm
38	A axis pulse equivalency	53.333	
39	A axis pulse unit	pulse/deg	
40	AB axis Selection	A axis	
390	X axis DIR signal Electric Level	Low	

Main Page | File Page | Param Page | DDCSV3.1@DDREAM

Picture 3-3 Configuration page

As the picture 3-3 shows, the configuration page can be divided into 4 columns:

1. Parameter Number

Each parameter has a specific number, the parameter can be modified .

2. Parameter Name

The definition of the Parameter is listed in the Parameter Name column. All Parameters are divided into groups according to their function.

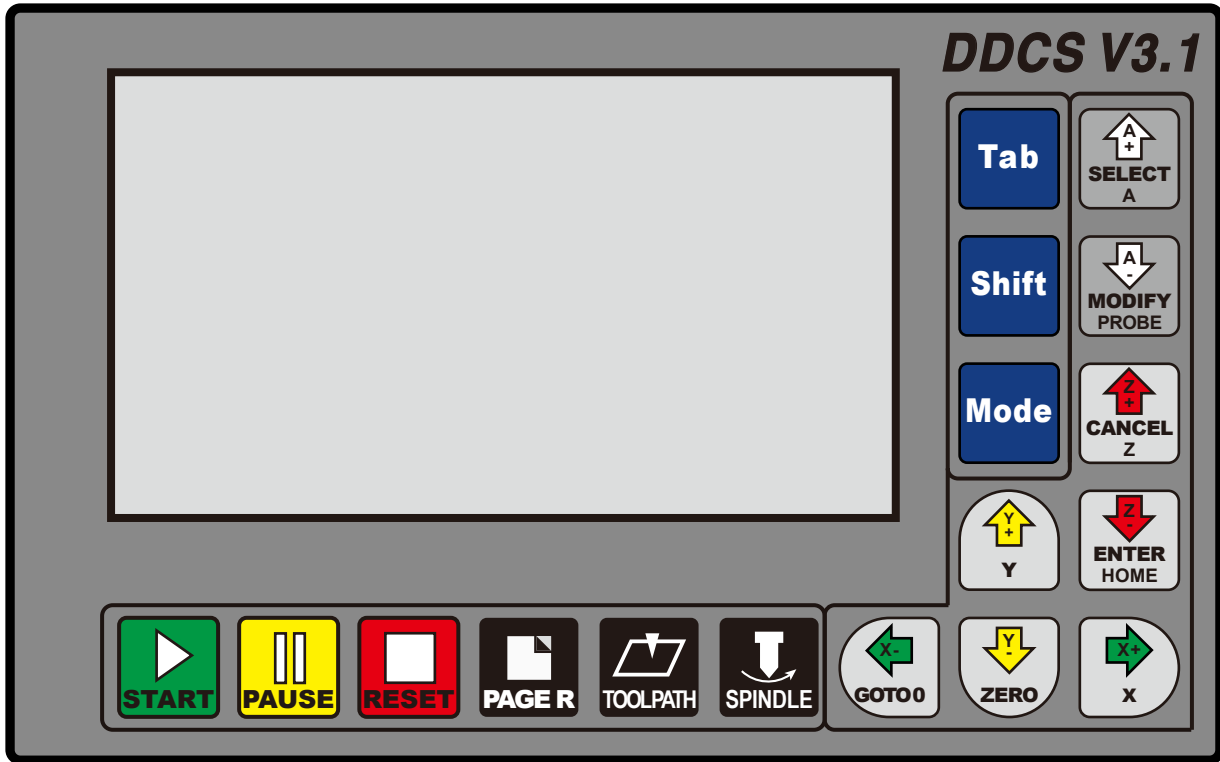
3. Parameter Value

The Parameter Value column lists the value of each Parameter. This value can be configured

4. Parameter Unit

The Parameter Unit lists the unit of each parameter.

3.2 Definition of Keys



Picture 3-4 Keys Layout

The picture 3-4 shows the key layout of the **DDCS**. The Controller **DDCS** has 17 keys. Please see table 3-1 for reference.

Keys Icon	Function No.	Definition	Notes
	1	Start operation	After loading the G code file, please press this key to start the operation. In case of Pause Status, press this key to continue the processing operation.
	1	Pause operation	Press this key to Pause the operation.
	1	Reset and E-STOP	If Reset is blinking, press this key to activate the controller. Press this key to stop processing urgently.
	1	Page switch	Switch through File Management Page, Processing Main Page and Parameter Configuration Page.
	1	Toolpath display switch	Switch the display between Coordinate Display or Tool Path Tracking display.
	1	Spindle manual start/close	Press this key to manually switch the spindle on or off. Can not be used if Reset is blinking and while processing an operation (Busy)
















Keys Icon	Function No.	Definition	Notes
	3	1: X axis moves left; 2: Cursor moves left 3: Goto Zero function	In "CONT Mode", the X axis will Continuously move negative after pressing this key. In "STEP Mode" X will move negative in steps. When in "Line Editing" or default F/S value modification, this key moves the cursor left. When in "2nd Function", this key has the goto Zero function.
	3	1: X axis moves right; 2: Cursor moves right 3: X axis select	In "CONT Mode", the X axis will Continuously move positive after pressing this key. In "STEP Mode" X will move positive in steps. When in "Line Editing" or default F/S value modification, this key moves the cursor right. When in "home/zero-clearing/ gotoz", this key opens the X axis coordinate edit window.
	3	1: Y axis moves forward; 2: Parameter value increases 3: Y axis select	In "CONT Mode", the Y axis will continuously move positive after pressing this key. In "STEP Mode" Y will move positive in steps. When in "Line Editing" or default F/S value modification, this key increases the value. When in "home/zero-clearing/ gotoz", this key this key opens the Y axis coordinate edit window.
	3	1: Y axis move backward; 2: Parameter value decreases; 3: Start the current coordinate 0-clearing	In "CONT Mode", the Y axis will continuously move negative after pressing this key. In "STEP Mode" Y will move negative in steps. When in "Line Editing" or default F/S value modification, this key decreases the value. When you start the 2nd function, this key has the Ycoordinate function.
	3	1: Z axis Plummer block 2: Z axis select 3: cancel	In "CONT Mode", the Z axis will continuously move positive after pressing this key. In "STEP Mode" Z will move positive in steps. When in "home/zero-clearing/ gotoz", this key opens Z axis coordinate edit window. This key is also CANCEL key.
	3	1: Z axis down 2: home 3: enter/select	In "CONT Mode", the Z axis will continuously move negative after pressing this key. In "STEP Mode" Z will move negative in steps. This key serves as the ENTER key and also is the HOME key
	4	1: A axis rotates in forward direction 2: A axis select 3: parameter increases 4: F/S default select/cancel	In "CONT Mode", the A axis will continuously move positive after pressing this key. In "STEP Mode" A will move positive in steps. When in "home/zero-clearing/ gotoz", this key opens the A axis coordinate edit window. When in FRO/ SRO/ SJR this key increases the parameter value. When in F or S, this key switches between default value or G code value
	4	1: A axis rotates in inversion direction 2: Probefunction 3: Parameter decreases 4: F/S default modification	In "CONT Mode", the A axis will continuously move negative after pressing this key. In "STEP Mode" A will move negative in steps. When in 2nd function, this key activates the PROBE. When in FRO/ SRO/ SJR this key decreases the parameter value. When in F or S, this key will open the Editing Window
	2	1: FRO/SRO/SJR/F/S/G ; 2: file copy	This switch will highlight the processing parameters FRO/ SRO/SJR/F/S/G54-59-MACH/M3-M11 While in BUSY it can activate FRO and SRO In File Management this is the COPY key
	2	1: Second function start 2: file paste	This key will shift to the second Mode (goto, zero, home, probe, goto breakpoint) . In File Management it is the PASTE key
	2	1: mod switch 2: file delete	When in READY, this key changes the Jog mode from Continuous to Step and MPG control. In File Management it is the DELETE key

Table 3-1 List of Keys' function

3.3 Operation of common functions

TIP

Do not press two keys at the same time

For example:  +  indicates that you should first press  and then release this key, then press 

3.3.1 File Management

When in the Main Page press  to enter the File Page, See Picture 3-5

Name	Size	Time
..	[DIR]	1970/01/09 08:25
BMP0. bmp	261174	1970/01/01 00:00
BMP1. bmp	261174	1970/01/01 00:00
BMP2. bmp	261174	1970/01/01 00:00
BMP3. bmp	261174	1970/01/01 00:01
2mmnew. tap	1525367	2018/12/23 10:39
ball1. nc	1653221	2017/12/27 10:26


F1-COPY | F2-PASTE | F3-EDIT | F4-NAME | INS-NEW | DEL-DEL
Main Page | File Page | Param Page | DDCSV3.1@DDREAM


Picture 3-5 File management page

The displays will show all folders and files in the root directory. The Name of folders and files, the size of files and the time and date of manipulation. The blue strip indicates the current valid target location.

Press  to move up

Press  to move down

Press  to quit the file management page

Press  If the blue bar is at “ . . ”, the Enter button will change to the last directory. If the blue bar

highlights a folder, it will open the folder. If the blue bar highlights a G code file, this button will load the G code and go back to the Main Page for processing. If the blue bar highlights a .set file, it will upgrade the system. In this case make sure you delete the settings file or the upgrade will overwrite the original settings file too and you will lose your settings.

1) Copy the file

Name	Size	Time
..	[DIR]	1970/01/09 08:25
BMP0. bmp	261174	1970/01/01 00:00
BMP1. bmp	261174	1970/01/01 00:00
BMP2. bmp	261174	1970/01/01 00:00
BMP3. bmp	261174	1970/01/01 00:01
BMP4. bmp	261174	1970/01/01 00:01
BMP5. bmp	261174	1970/01/01 00:01
BMP6. bmp	261174	1970/01/01 00:04
BMP7. bmp	261174	1970/01/01 00:04
BMP8. bmp	261174	1970/01/01 00:06
BMP10. bmp	261174	1970/01/01 00:07
2mmnew. tap	1525367	1970/01/01 00:07

F1-COPY | F2-PASTE | F3-EDIT | F4-NAME | INS-NEW | DEL-DEL
Main Page | File Page | Param Page | DDCSV3.1@DDREAM

Picture 3-6 Select 2mmnew.tap file and copy the file

Here the 2mmnew.tap file is selected. Press the **Tab** key to copy the 2mmnew.tap file into memory

2) Paste the file

Name	Size	Time
..	[DIR]	1970/01/09 08:25

F1-COPY | F2-PASTE | F3-EDIT | F4-NAME | INS-NEW | DEL-DEL
Main Page | File Page | Param Page | DDCSV3.1@DDREAM

Picture 3-7 Switch to the target folder

Choose your target directory or target folder, click **Shift** to paste the 2mmnew.tap file to this directory. See picture 3-8 for reference

Name	Size	Time
..	[DIR]	1970/01/09 08:25
BMP0. bmp	261174	1970/01/01 00:00
BMP1. bmp	261174	1970/01/01 00:00
BMP2. bmp	261174	1970/01/01 00:00
BMP3. bmp	261174	1970/01/01 00:01
BMP4. bmp	261174	1970/01/01 00:01
BMP5. bmp	261174	1970/01/01 00:01
BMP6. bmp	261174	1970/01/01 00:04
2mmnew. tap	1525367	2018/12/23 10:39
ball1. nc	1653221	2017/12/27 10:26

F1-COPY | F2-PASTE | F3-EDIT | F4-NAME | INS-NEW | DEL-DEL
Main Page | File Page | Param Page | DDCSV3.1@DDREAM

Picture 3-8 Paste the 2mmnew.tap file to this directory

3) Delete a file

Highlight the required file and click  to delete the file

CONT		READY	2mmnew.tap	00:00:00
Name	Size	Time		
..	[DIR]	1970/01/09 08:25		
BMP0.bmp	261174	1970/01/01 00:00		
BMP1.bmp	261174	1970/01/01 00:00		
BMP2.bmp	261174	1970/01/01 00:00		
BMP3.bmp	261174	1970/01/01 00:01		
BMP4.bmp	261174	1970/01/01 00:01		
BMP5.bmp	261174	1970/01/01 00:01		
BMP6.bmp	261174	1970/01/01 00:04		
2mmnew.tap	1525367	2018/12/23 10:39		
ball1.nc	1653221	2017/12/27 10:26		

F1-COPY | F2-PASTE | F3-EDIT | F4-NAME | INS-NEW | DEL-DEL
Main Page | File Page | Param Page | DDCSV3.1@DDREAM

Picture 3-9 Move the blue strip to the 2mmnew.tap file, click MODE to delete

CONT		READY	2mmnew.tap	00:00:00
Name	Size	Time		
..	[DIR]	1970/01/09 08:25		
BMP0.bmp	261174	1970/01/01 00:00		
BMP1.bmp	261174	1970/01/01 00:00		
BMP2.bmp	261174	1970/01/01 00:00		
BMP3.bmp	261174	1970/01/01 00:01		
BMP4.bmp	261174	1970/01/01 00:01		
BMP5.bmp	261174	1970/01/01 00:01		
BMP6.bmp	261174	1970/01/01 00:04		
BMP7.bmp	261174	1970/01/01 00:04		
BMP8.bmp	261174	1970/01/01 00:06		
ball1.nc	1653221	2017/12/27 10:26		

F1-COPY | F2-PASTE | F3-EDIT | F4-NAME | INS-NEW | DEL-DEL
Main Page | File Page | Param Page | DDCSV3.1@DDREAM

Picture 3-10 Delete the 2mmnew.tap file

4) Load the G code file

Highlight the G code file required and click . The file will be loaded and the screen will change back to the Main Screen for processing. The file name will be displayed.

CONT		READY	2mmnew.tap	00:00:00
Name	Size	Time		
..	[DIR]	1970/01/09 08:25		
BMP0.bmp	261174	1970/01/01 00:00		
BMP1.bmp	261174	1970/01/01 00:00		
BMP2.bmp	261174	1970/01/01 00:00		
BMP3.bmp	261174	1970/01/01 00:01		
BMP4.bmp	261174	1970/01/01 00:01		
BMP5.bmp	261174	1970/01/01 00:01		
BMP6.bmp	261174	1970/01/01 00:04		
BMP7.bmp	261174	1970/01/01 00:04		
BMP8.bmp	261174	1970/01/01 00:06		
BMP10.bmp	261174	1970/01/01 00:07		
2mmnew.tap	1525367	1970/01/01 00:07		

F1-COPY | F2-PASTE | F3-EDIT | F4-NAME | INS-NEW | DEL-DEL
Main Page | File Page | Param Page | DDCSV3.1@DDREAM

Picture 3-11 Search for the file2mmnew.tap


CONT	READY	2mmnew.tap	00:00:00
X	0.000	0.000 ^{mm}	FRO: 100%
Y	0.000	0.000 ^{mm}	SRO: 100%
Z	5.000	5.000 ^{mm}	SJR 100%
A	0.000	0.000	F 0 25000
			S 0 24000
			G54 M5 M9 M11
			Normal Mod
			Ver:2018-11-20-105NOR
Main Page	File Page	Param Page	DDCSV3.1@DDREAM

Picture 3-12 After loading the file 2mmnew.tap the file name will be displayed





3.3.2 Running a G code file





1) Start running G code





After loading the G code file, make sure the controller is in READY. If RESET is blinking, just press

the  key and ensure the operation status column displays READY.

Now set ZERO as requested. For example, if the G code file defines the work piece center as the XY ZERO point, move the cutter to that position.

Click the  button and then click the  button. The Operation Window will give you several options. Click  and an EDIT WINDOW will open. Click  to Zero X.

Click the  button again and then click the  button. Now click  to select Y Axis and an EDIT WINDOW will open. Click  to Zero Y.

After ZERO is set, press  to run the G code file. During Gcode processing, only the function of  and  are valid. The  key can set the values of FRO (Processing Speed) and SRO (Spindle Speed).


See Picture 3-13.

Look at Current Operation (just below the Axis Read Out). It shows that the G code has been processed

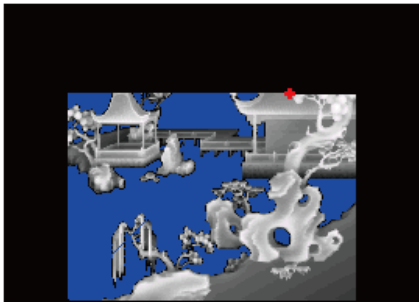
to line 180th. The controller now is in BUSY Mode. Press  to switch the display to show the tool path. Picture3-14,15 and 16 show the tool path display.

AUTO		BUSY		2mmnew.tap		00:00:11	
X	-38.019	-38.019		mm	FRO:	100%	
Y	-49.825	-49.825		mm	SRO:	100%	
Z	-1.284	-1.284		mm	SJR	100%	
A	0.000	0.000			F	3055	10000
180: X-36.575Z-1.157					S	24000	24000
Main Page					G54	M3 M9 M11	
File Page					Normal Mod		
Param Page					Ver:2018-11-20-105NOR		
					DDCSV3.1@DDREAM		

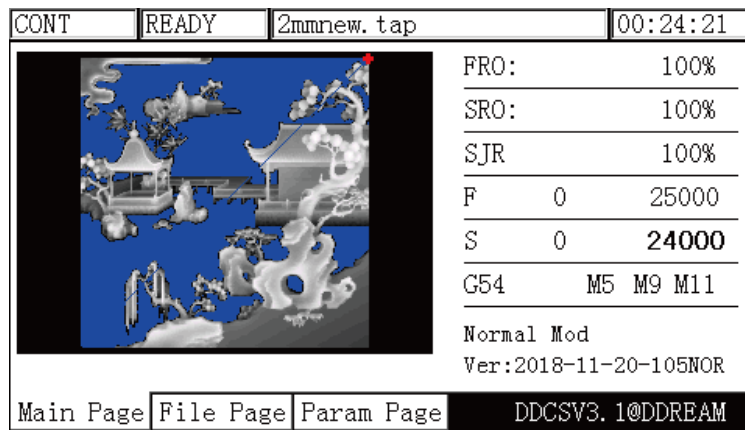
Picture 3-13 G code processing

AUTO		BUSY		2mmnew.tap		00:00:23	
				FRO:	100%		
				SRO:	100%		
				SJR	100%		
				F	2622	10000	
				S	24000	24000	
				G54	M3 M9 M11		
				1717: X4.915Z-1.207			
				Ver:2018-11-20-105NOR			
Main Page				DDCSV3.1@DDREAM			
File Page							
Param Page							

Picture 3-14 Tool path display after processing at beginning the file

AUTO		BUSY		2mmnew.tap		00:17:45	
				FRO:	100%		
				SRO:	100%		
				SJR	100%		
				F	1335	10000	
				S	24000	24000	
				G54	M3 M9 M11		
				70929: X27.987Z-0.328			
				Ver:2018-11-20-105NOR			
Main Page				DDCSV3.1@DDREAM			
File Page							
Param Page							


Picture 3-15 Tool path display after processing most of the file

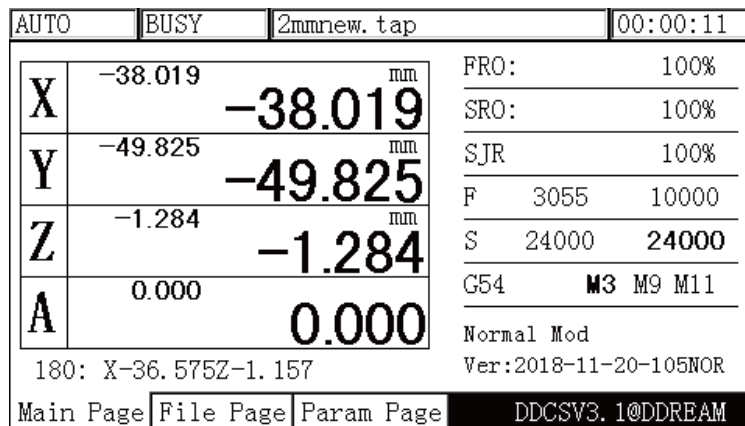


Picture 3-16 Tool path display, processing completed

2) Breakpoint operation




Press  to enter the second mode. Click  to enter the breakpoint operation. The controller will run from the last record breakpoint.

Note: When you click , it will automatically produce a breakpoint. In case of power outage, it will also automatically record the breakpoint. As the picture 3-17 shows, it begins processing from the 180th line at this time. Picture 3-17 shows the display under the “goto break” status and the display shows the file name.



Picture 3-17 Breakpoint Operation

3) Start a G code file from a specific line


Click  to enter the 2nd mode. When in 2nd mode, click  and the Start Line Edit Box will appear. Insert the line number and click . A syntax check will be performed and the G code will be operated from your chosen Start Line position. See pictures 3-18 to 3-20.

CONT	READY	2mmnew.tap	00:00:42
X	20.638	20.638 ^{mm}	FRO: 100%
Y	-43.025	-43.025 ^{mm}	SRO: 100%
Z	3.708	3.708 ^{mm}	SJR 100%
A	0.000	0.000	F 0 25000
Start Line: 000001717			S 0 24000
			G54 M5 M9 M11
			Normal Mod
			Ver:2018-11-20-105NOR
Main Page	File Page	Param Page	DDCSV3.1@DDREAM

Picture 3-18 Edit the start line


MPG	READY	2mmnew.tap	00:00:42
X	20.638	20.638 ^{mm}	FRO: 100%
Y	-43.025	-43.025 ^{mm}	SRO: 100%
Z	3.708	3.708 ^{mm}	SJR 100%
A	0.000	0.000	F 0 25000
syntax checking 1717...			S 0 24000
			G54 M5 M9 M11
			Normal Mod
			Ver:2018-11-20-105NOR
Main Page	File Page	Param Page	DDCSV3.1@DDREAM

Picture 3-19 Syntax Checking


AUTO	BUSY	2mmnew.tap	00:00:42
			FRO: 100%
			SRO: 100%
			SJR 100%
			F 2622 10000
			S 24000 24000
			G54 M3 M9 M11
			Normal Mod
1717: X4.915Z-1.207			Ver:2018-11-20-105NOR
Main Page	File Page	Param Page	DDCSV3.1@DDREAM

Picture 3-20 Program will run from the chosen line

4) Pause in operation


During file processing, press the  key to pause the operation. The Operation Status Column will display “READY” and the Z axis will lift the tool to the defined safe height.

5) ESTOP in operation


During file processing, press the  key to ESTOP the procedure. The Operation Status Column will display “RESET” flashing. The spindle will stop.

6) Start/Stop spindle

Only when the Operation Status Column displays “READY” you can manually start or stop the spindle.




Use  the spindle button to switch from Start to Stop and back.



3.3.3 Manually position the machine

You can manually position the machine at any position. You can move Continuous, in defined Steps or with the MPG. The  button moves you through the three options:

1) Manual step of the X axis

Press  till “step” is displayed. In picture 3-21 Step parameter shows the current step rate (0.01mm).



Press the  button till SJR is highlighted and you can change the steps by  and  keys.

Press the  key to move the X axis negative 0.01mm, and press  to move the X axis 0.01mm positive. Move Y Z and A in the same way.

STEP	READY	2mmnew.tap	00:00:42
X	20.638	20.638 mm	FR0: 100%
Y	-43.025	-43.025 mm	SRO: 100%
Z	3.708	3.708 mm	SJR 0.01
A	0.000	0.000	F 0 25000
			S 0 24000
			G54 M5 M9 M11
			Normal Mod
			Ver:2018-11-20-105NOR
Main Page	File Page	Param Page	DDCSV3.1@DDREAM

Picture 3-21 STEP Mode

2) Manual continuous operation of the X axis

Click **Mode** till CONT is displayed. The feed status displays “CONT”. See picture 3-22. You can now move the axis continuous with the arrow keys. Adjust the Jog speed by highlighting SJR and modify the jog speed with  and . All other axes can be moved in the same way.

CONT		READY	2mmnew.tap	00:00:42
X	20.638	mm	20.638	FRO: 80%
Y	-43.025	mm	-43.025	SRO: 80%
Z	3.708	mm	3.708	SJR 120%
A	0.000		0.000	F 0 25000
				S 0 24000
				G54 M5 M9 M11
				Normal Mod
				Ver:2018-11-20-105NOR
Main Page		File Page	Param Page	DDCSV3.1@DDREAM

Picture 3-22 Enter the manual Continuously moving mode

3) Use MPG to operate X axis



Click **Mode** till the Feed Status displays “MPG”. Use the MPG to move the machine.

MPG		READY	2mmnew.tap	00:00:42
X	20.638	mm	20.638	FRO: 100%
Y	-43.025	mm	-43.025	SRO: 100%
Z	3.708	mm	3.708	SJR 100%
A	0.000		0.000	F 0 25000
				S 0 24000
				G54 M5 M9 M11
				Normal Mod
				Ver:2018-11-20-105NOR
Main Page		File Page	Param Page	DDCSV3.1@DDREAM

Picture 3-23 Enter the MPG mode



3.3.4 Main Page Parameter adjustments

The values FRO, SRO, SRJ, F, S Coordinate system and the M codes can easily be changed



Click **Tab** till the display highlights what you want to adjust and then click  or .

1) FRO

The FRO parameters. Under “READY” press **Tab** till FRO is highlighted (bold).



With  and  adjust the value between 0% to 300%

2) SRO

The Spindle adjustment controls the spindle’s speed. Highlight SRO and use  and  to adjust the spindle speed from 0% to 200%

3) SJR

The SJR is to adjust the jog speed. In “CONT” mode you can adjust from 0% to 150%.



In “Step” mode you can adjust 0.01mm, 0.1mm, 1mm and 10mm. Use  and  to adjust and choose your value. Click on the Axes arrow keys will move the machine this distance once.

CONT	READY	2mmnew.tap	00:00:42
X	20.638	20.638 mm	FRO: 80%
Y	-43.025	-43.025 mm	SRO: 80%
Z	3.708	3.708 mm	SJR 120%
A	0.000	0.000	F 0 25000
			S 0 24000
			G54 M5 M9 M11
			Normal Mod
			Ver:2018-11-20-105NOR
Main Page	File Page	Param Page	DDCSV3.1@DDREAM

Picture 3-24 SJR value adjusts to 10 under the mode of “step”

4) F Value modification

The F value adjustment the default Feed Speed. Use the **Tab** key to highlight F.

If you click  or  an Edit Window will appear Choose your desired Feed speed and confirm with Enter. See picture 3-23

CONT	READY	2mmnew.tap	00:00:42
X	20.638	20.638 mm	FRO: 80%
Y	-43.025	-43.025 mm	SRO: 80%
Z	1.006	1.006 mm	SJR 120%
A	0.000	0.000	F 0 24000
			S 0 24000
			G54 M5 M9 M11
			Normal Mod
			Ver:2018-11-20-105NOR
Main Page	File Page	Param Page	DDCSV3.1@DDREAM

Picture 3-25 Enter default F modification mode

5) S Value modification

Use the **Tab** key to highlight S. If you click  or  an Edit Window will appear



Choose your desired Feed speed and confirm with Enter.

CONT	READY	2mmnew.tap	00:00:42
X	20.638	20.638 ^{mm}	FR0: 80%
Y	-43.025	-43.025 ^{mm}	SRO: 80%
Z	1.006	1.006 ^{mm}	SJR 120%
A	0.000	0.000	F 0 24000
			S 0 24000
			G54 M5 M9 M11
			Normal Mod
			Ver:2018-11-20-105NOR
Main Page	File Page	Param Page	DDCSV3.1@DDREAM

Picture 3-26 Enter the status of modifying default S value

6) Select G coordinate system

Under “READY”, press the **Tab** key till the Coordinate System is highlighted. It will display G54,G59 or MACH (stands for Machine Coordinates).

Use  and  to choose your desired Coordinate System. Position values will be displayed for X, Y, Z and A. The Enter key confirms the Coordinate System you chose.

3.3.5 The 2nd Mode

The 2nd key opens several functions.

In READY mode, the Operation Window displays “Normal Mode”. Press **Shift** to enter the 2nd mode. The Operation Window will show: X-:gotoz Y-:zero Z-: home A-:probe start:goto break and the Feed Status column displays “2nd mode”. See picture 3-27. You can now make your choice which may open new options accordingly.

2ND		READY	2mmnew.tap	00:24:21
X	0.000	0.000 ^{mm}	FRO:	100%
Y	0.000	0.000 ^{mm}	SRO:	100%
Z	5.000	5.000 ^{mm}	SJR	100%
A	0.000	0.000	F	0 25000
			S	0 24000
			G54	M5 M9 M11
			X-:gotoz Y-:zero Z-:home	
			A-:probe Start:goto break	
Main Page		File Page	Param Page	DDCSV3.1@DDREAM

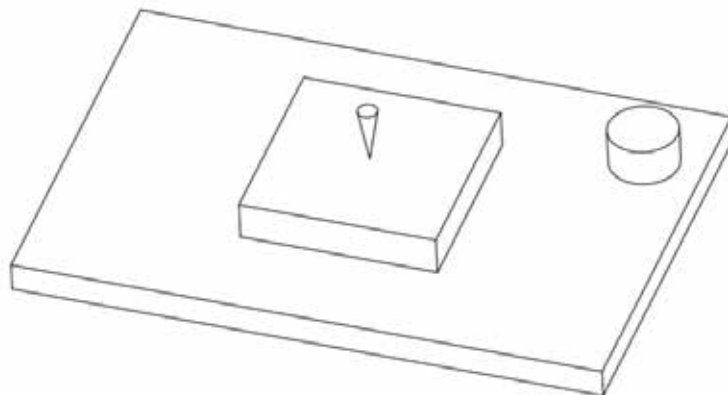
Picture 3-27 Enter the “2nd function” Mode

Tip

Lets say you want to choose the center of your material as the X and Y Zero position. Move the machine with the arrow keys to the desired XY position. Alternatively use the MPG to do this.

Now press the **Shift** key and the Operation Window will show: X-:gotoz, Y-:zero, Z-: home, A-:probe, start:goto break .

Press the **Shift** key again and the coordinates of X Y and Z will show 0.000



Picture 3-28 The tool tip over the work piece center

Tip:

Do not forget to probe again after a tool change

3.4 Parameter setting




The DDCS stores the machine settings in a parameter file called setting.set. This file is a basic text file. You can modify all the parameters in the Parameter Page but also within the setting.set file. Originally the DDCS V3.1 will be loaded with the default setting and you can change the settings in the Parameter Page (or in the text file setting.set) to adjust for your machine.

Tip:

Back up your setting.set file... just in case.

3.4.1 Parameter loading method

Copy the parameter file to the USB drive and insert it into the USB interface one the controller. As the

Picture 3-28 shows,press the key  in the main page to ensure that the status column can display “READY” and then press the key  to switch to the file management page. As the Picture 3-30 shows, select the parameter file Uservar.set and then press the Enter key  to load the parameter file. It probably needs to wait for 1-5s and the “READY” of status column will automatically change into “reset” with flashing, which indicates the parameter loads successfully.













CONT	READY	2mmnew.tap	00:00:42
X	20.638	20.638 mm	FRO: 80%
Y	-43.025	-43.025 mm	SRO: 80%
Z	-2.159	-2.159 mm	SJR 120%
A	0.000	0.000	F 0 24000
			S 0 12000
			G54 M5 M9 M11
			Normal Mod
			Ver:2018-11-20-105NOR
Main Page	File Page	Param Page	DDCSV3.1@DDREAM

Picture 3-29 Ensure the status column is the status of “READY”

CONT	READY	2mmnew.tap	00:00:00
Name	Size	Time	
..	[DIR]	1970/01/09 08:25	
BMP0.bmp	261174	1970/01/01 00:00	
BMP1.bmp	261174	1970/01/01 00:00	
BMP2.bmp	261174	1970/01/01 00:00	
BMP3.bmp	261174	1970/01/01 00:01	
BMP4.bmp	261174	1970/01/01 00:01	
BMP5.bmp	261174	1970/01/01 00:01	
BMP6.bmp	261174	1970/01/01 00:04	
2mmnew.tap	1525367	2018/12/23 10:39	
ball1.nc	1653221	2017/12/27 10:26	
UserVar.Set	170000	2018/12/21 10:35	
F1-COPY F2-PASTE F3-EDIT F4-NAME INS-NEW DEL-DEL			
Main Page	File Page	Param Page	DDCSV3.1@DDREAM

Picture 3-30 Selct the uservar.set file and enter

3.4.2 Set the Parameters in the Parameter setting Page

In the main page, ensure the operation status is “READY” and press the key  two times continuously to enter the Parameter Page. As the picture 3-31 shows, in the parameter configuration page, pressing the key  and  is to turn the page forward and backward. Pressing the key  and  is to select the current parameter items up and down. When you select the parameters which are required to modify, please press the key  to enter the current parameter modification mode. At this time, it will pop up a small dialog box of the modified value, which is the same with the other parameters. Pressing the key  and  is to adjust the current bit. Pressing the key  and  is to adjust the value of the current bit. After finishing modification, please press the key  to return to the parameter select. After finishing modifying the parameter, it needs to press  to return to the homepage, thus loading the parameter and making the parameter takes effect.

No.	Param Name	Value	Unit
--- [Top parameters] ---			
5	minimum log radius of 4axis machinir	5.000	mm
6	A axis rotate reference axis	not rotate	
104	A axis optimal path when G0 run	No	
--- [Motor parameters] ---			
33	Motor start speed	150.000	mm/min
34	X axis pulse equivalency	1280.000	pulse/mm
35	Y axis pulse equivalency	1280.000	pulse/mm
36	Z axis pulse equivalency	3200.000	pulse/mm
38	A axis pulse equivalency	53.333	
39	A axis pulse unit	pulse/deg	
40	AB axis Selection	A axis	
390	X axis DIR signal Electric Level	Low	

Picture 3-31 Enter the parameter configuration page

3.4.3 The detailed definition of parameters

The parameter file can be edited, but it needs to follow the definite standards, the standards are as follows:

- a、 One line can only be edited one parameter.
- b、 The parameter format is #/parameter mark/value/Unit. Among them, # must be the first character of each line.# should closely be followed by the parameter mark and the following mark will be followed by the actual value.
- c、 After the parameter has assignment and equation, the part of parameter interpretation can have any format without constraint.
- d、 Each parameter is regulated with assignment scope. Please do the assignment in strict accordance with the assignment scope.
- e、 Each parameter is set with default value in advance. Please use the setting value of default parameter under the situation of not understanding the actual function of this parameter.

1) Configuration parameter of motor (16 in total)

Para. Mark	Parameter definition	Default value	Parameter Unit	Parameter Scope	Notes
#33	speed of motor start running	50	mm/min	0~200	Speed of motor start running's first step
#34	Pulse /mm X axis	640	Pulse/mm	100~10000	
#35	Pulse /mm Y axis	640	Pulse/mm	100~10000	
#36	Pulse /mm Z axis	640	Pulse/mm	100~10000	
#38	Pulse /mm A axis	640	Pulse/degree	100~10000	
#390	level of X axis DIR signal	0	BOOL	1/0	1=high,0=low
#391	level of Y axis DIR signal	0	BOOL	1/0	
#392	level of Z axis DIR signal	1	BOOL	1/0	
#393	level of A axis DIR signal	0	BOOL	1/0	
#416	time between DIR & pulse	300	ns	0~1000	Differential between direction and pulse
#418	level of X axis pulse signal	0	BOOL	1/0	axis pulse signal of X,Y,Z,A as well as the Pulse signal value when there is no pulse.
#419	level of Y axis pulse signal	0	BOOL	1/0	
#420	level of Z axis pulse signal	1	BOOL	1/0	
#421	level of A axis pulse signal	1	BOOL	1/0	

2) Parameter of manual control motion(16 in total)

Para. Mark	Parameter definition	Default value	Parameter Unit	Parameter Scope	Notes
#41	max speed of X in M_Ctrl mode	16000	mm/min	0~20000	The parameter value of this group has set a upper limit for the SJR
#42	max speed of Y in M_Ctrl mode	16000	mm/min	0~20000	
#43	max speed of Z in M_Ctrl mode	16000	mm/min	0~20000	
#44	max speed of A in M_Ctrl mode	16000	degree/min	0~20000	
#45	start Acceleration of X in M_Ctrl mode	600	mm/s ²	0~2000	4 axis of X,Y,Z,A manual start acceleration
#46	start Acceleration of Y in M_Ctrl mode	600	mm/s ²	0~2000	
#47	start Acceleration of Z in M_Ctrl mode	600	mm/s ²	0~2000	
#48	start Acceleration of A in M_Ctrl mode	600	degree/s ²	0~2000	
#100	manual control speed of X axis	8000	mm/min	0~20000	Panel keys operation the X,Y,Z,A axis Continuously move speed
#101	manual control speed of Y axis	8000	mm/min	0~20000	
#102	manual control speed of Z axis	4000	mm/min	0~20000	
#103	manual control speed of A axis	12000	degree/min	0~20000	
#263	stop Acceleration of X in M_Ctrl mode	1200	mm/s ²	0~2000	4 axis of X,Y,Z,A manually stop acceleration, the stop acceleration can be set appropriately larger
#264	stop Acceleration of Y in M_Ctrl mode	1200	mm/s ²	0~2000	
#265	stop Acceleration of Z in M_Ctrl mode	1200	mm/s ²	0~2000	
#266	stop Acceleration of A in M_Ctrl mode	1200	degree/s ²	0~2000	

3) Automatic processing parameter(11 in total)

Para. Mark	Parameter definition	Default value	Parameter Unit	Parameter Scope	Notes
#15	Speed selection for Gcode file	1	BOOL	1/0	0:set by G code; 1:use default speed
#76	Default operation speed	1500	mm/min	0~20000	
#77	Max operation speed	8000	mm/min	0~30000	
#78	Max speed of Z+	3000	mm/min	0~20000	
#79	Max speed of Z-	3000	mm/min	0~20000	
#80	Speed of G0	5000	mm/min	0~20000	
#82	Safe height of Z axis	5	mm	0~500	Retract height of Z
#89	Z retract distance	5	mm	0~99	This value cannot be negative value
#99	Operation acceleration	500	mm/min ²	0~2000	
#435	Max speed of X axis	8000	mm/min	0~20000	
#436	Max speed of Y axis	8000	mm/min	0~20000	

4) Parameter of coordinate system(1 in total)

Para. Mark	Parameter definition	Default value	Parameter Unit	Parameter Scope	Notes
#16	Current coordinate system	1	BOOL	0~6	0~5: G54~G59, 6: Machine

5) Parameter of spindle(8 in total)

Para. Mark	Parameter definition	Default value	Parameter Unit	Parameter Scope	Notes
#98	Max spindle speed	24000	rpm	0~50000	Spindle PWM or voltage signal full range is corresponding to speed value
#220	Spindle speed selection	1	BOOL	1/0	0: G code, 1: Default
#221	Default spindle speed	12000	rpm	0~50000	
#222	Activate M3/M5	1	BOOL	1/0	1: Yes; 0: No
#224	Delay time of M3/M5	3	s	0~100	Spare enough time for spindle response
#227	active level of spindle	1	BOOL	1/0	Corresponding output electrical level when the spindle starting
#422	definition of PWM level	0	BOOL	1/0	The output voltage value is 0, the spindle is 0, voltage is 10V, speed is full.
#433	Acceleration time of PWM	1111	Time equivalent	1~65535	The acceleration time to full speed is #433*0.0005s

6) IO output parameter(5 in total)

Para. Mark	Parameter definition	Default value	Parameter Unit	Parameter Scope	Notes
#223	Activate M code (M8/M9, M10/M11)	1	BOOL	1/0	1: Yes; 0: No
#225	Delay time of M8/M9	1	S	1~20	Delay time after M8/M9/M10/M11 code
#226	Delay time of M10/M11	1	S	1~20	
#228	Active level of M8/M9	1	BOOL	1/0	1: Yes; 0: No
#229	Active level of M10/M11	1	BOOL	1/0	1: Yes; 0: No

7) 0-point function parameter(20 in total)

Para. Mark	Parameter definition	Default value	Parameter Unit	Parameter Scope	Notes
#52	Enable X home	1	BOOL	1/0	1: Yes; 0: No
#53	Enable Y home	1	BOOL	1/0	
#54	Enable of Z home	1	BOOL	1/0	
#55	Enable of A home	1	BOOL	1/0	
#56	Home speed of X	8000	mm/s	1~20000	
#57	Home speed of Y	8000	mm/s	1~20000	
#58	Home speed of Z	8000	mm/s	1~20000	
#59	Home speed of A	8000	mm/s	1~20000	
#60	Signal Level X Home	0	BOOL	1/0	1: High; 0: Low
#61	Signal Level Y Home	0	BOOL	1/0	
#62	Signal Level Z Home	0	BOOL	1/0	
#63	Signal Level A Home	0	BOOL	1/0	
#64	direction of X home	0	BOOL	1/0	0: reverse direction home(--) 1: forward direction home(++)
#65	direction of Y home	0	BOOL	1/0	
#66	direction of Z home	0	BOOL	1/0	
#67	direction of A home	0	BOOL	1/0	
#83	back off distance of X after home	10	mm	0~1000	After homing, each axis needs to move away from the home switch for a certain distance. The parameter of this group is this back off distance
#84	back off distance of Y after home	10	mm	0~1000	
#85	back off distance of Z after home	10	mm	0~1000	
#86	back off distance of A after home	10	mm	0~1000	

8) Parameter of Probe function (8 in total)

Para. Mark	Parameter definition	Default value	Parameter Unit	Parameter Scope	Notes
#68	enable Probe	1	BOOL	1/0	0: disable 1: enable
#69	thickness of tool sensor	20	mm	0~200	
#70	level of probe signal	0	BOOL	1/0	1: High; 0:Low active
#71	initial tool's position	0	BOOL	1/0	0: current position; 1:fixed position mode
#72	initial X axis in fixed mode	0	mm	0-9999	Tools position X coordinate in the Mach(ine) coordinate system
#73	initial Y axis in fixed mode	0	mm	0-9999	Tools position Y coordinate in the Mach(ine) coordinate system
#74	initial Z axis in fixed mode	0	mm	0-9999	Height of Z axis before the XY move under the Mach(ine) coordinate system
#75	Back off distance after probing	10	mm	0~200	

9) Parameter of hard limit function(16 in total)

Para. Mark	Parameter definition	Default value	Parameter Unit	Parameter Scope	Notes
#400	enable X-- limit	1	BOOL	1/0	0: Disable 1: Enable
#401	enable Y-- limit	1	BOOL	1/0	0: Disable 1: Enable
#402	Enable Z-- limit	1	BOOL	1/0	0: Disable 1: Enable
#403	enable A-- limit	1	BOOL	1/0	0: Disable 1: Enable
#404	enable X++ limit	1	BOOL	1/0	0: Disable 1: Enable
#405	enable Y++ limit	1	BOOL	1/0	0: Disable 1: Enable
#406	enable Z++ limit	1	BOOL	1/0	0: Disable 1: Enable
#407	enable A++ limit	1	BOOL	1/0	0: Disable 1: Enable
#408	active level X-- limit	0	BOOL	1/0	1: High; 0:Low
#409	active level Y-- limit	0	BOOL	1/0	1: High; 0:Low
#410	active level Z-- limit	0	BOOL	1/0	1: High; 0:Low
#411	active level A-- limit	0	BOOL	1/0	1: High; 0:Low
#412	active level X++ limit	0	BOOL	1/0	1: High; 0:Low
#413	active level Y++ limit	0	BOOL	1/0	1: High; 0:Low
#414	active level Z++ limit	0	BOOL	1/0	1: High; 0:Low
#415	active level A++ limit	0	BOOL	1/0	1: High; 0:Low

10) Parameter of soft limit function (9 in total)

Para. Mark	Parameter definition	Default value	Parameter Unit	Parameter Scope	Notes
#374	enable Soft Limit	0	BOOL	1/0	0:Disable, 1:Enable
#375	value X-- Soft Limit	-400	BOOL	-2000~0	The set value will trigger the limit signal. The limit values refer to the machine coordinates, not the work piece coordinate.
#376	value Y-- Soft Limit	-400	BOOL	-2000~0	
#377	value Z-- Soft Limit	-400	BOOL	-2000~0	
#378	value A-- Soft Limit	-400	BOOL	-2000~0	
#379	value X++ Soft Limit	400	BOOL	0~2000	The set value will trigger the limit signal. The limit values refer to the machine coordinates, not the work piece coordinate.
#380	value Y++ Soft Limit	400	BOOL	0~2000	
#381	value Z++ Soft Limit	400	BOOL	0~2000	
#382	value A++ Soft Limit	400	BOOL	0~2000	

11) Parameter of MPG function(5 in total)

Para. Mark	Parameter definition	Default value	Parameter Unit	Parameter Scope	Notes
#428	Enable MPG RESET	1	BOOL	1/0	0: Disable,1: Enable
#429	Level of MPG RESET	0	BOOL	1/0	1: High; 0:Low
#430	Type of MPG port	1	BOOL	1/0	0:UART,1: Standard
#431	Pulse of MPG	0	BOOL	1/0	0: 100 steps /cycle,1: 24 steps /cycle
#432	IO signal level of MPG	0	BOOL	1/0	1: High; 0:Low

12) Parameter extended functions (7 in total)

Para. Mark	Parameter definition	Default value	Parameter Unit	Parameter Scope	Notes
#423	External RESET	1	BOOL	1/0	1: High; 0:Low
#424	Level External RESET	0	BOOL	1/0	1: High; 0:Low
#425	Enable of External Key	1	BOOL	1/0	0: Disable,1: Enable
#426	Level of External Key 1	0	BOOL	1/0	1: High; 0:Low
#427	Level of External Key 2	0	BOOL	1/0	1: High; 0:Low
#446	Function of External Key 1	0	BOOL	1/0	0:Start,1:Find Center
#447	Function of External Key 2	0	BOOL	1/0	0:Pause,1: Zero

13) Parameter of Backlash (9 in total)

Para. Mark	Parameter definition	Default value	Parameter Unit	Parameter Scope	Notes
#437	Enable of X backlash	0	BOOL	1/0	0:Disable,1:Enable
#438	Enable of Y backlash	0	BOOL	1/0	
#439	Enable of Z backlash	0	BOOL	1/0	
#440	Enable of A backlash	0	BOOL	1/0	
#441	Distance of X axis backlash	0	mm	0~200	Set the backlash return as you need for each axis. Tip: experiment with the settings and check the results
#442	Distance of Y axis backlash	0	mm	0~200	
#443	Distance of Z axis backlash	0	mm	0~200	
#444	Distance of A axis backlash	0	mm	0~200	
#445	Speed of backlash	0	mm/min	0~2000	

14) Other parameters(6 in total)

Para. Mark	Parameter definition	Default value	Parameter Unit	Parameter Scope	Notes
#1	Language	1	BOOL	1/0	0: English,1: Chinese
#2	Interface response speed while processing	400		400-10000	Note: For general G-code file, the parameter can be set as 400. If the file has many small segments, adjust the parameter to be larger.
#495	circle of interpolation	0.002	s	0.002-0.01	circle of interpolation
#250	enable of draw tool road	1	BOOL	1/0	0:disable 1: enable
#253	mode of draw	0	BOOL	1/0	0:statue mode 1:line mode
#499	user access key	888888	N/A	0-999999	

Mode of draw tool road: As for the plane line, such as the PCB engraving or the color plates lettering, please adopt the line pattern. As for the plane embossment, please adopt the statue pattern.





3 G code and M Code List

G Code	Name	Definition	Use case
G0	Quick positioning	Operate to the assigned position with the highest speed set by the system	G0 X..Y.. Z..
G1	Spindle straightaway cut	Operate to the assigned position according to the F value assigned by the system or the file	G1 X..Y.. Z..
G2	Spindle cut along the circle	Arc cutting machining clockwise	Radius method:G2X..Y..Z..R..F.. Circle center method : G2X..Y ..Z..I..J..K..F
G3	Spindle cut inverting the circle	Arc cutting machining clockwise	Radius method:G2X..Y..Z..R..F.. Circle center method : G2X..Y ..Z..I..J..K..F
G17	XY plane select	Interpolation plane selects the XY plane	G17
G18	ZX plane select	Interpolation plane selects the YZ plane	G18
G19	YZ plane select	Interpolation plane selects the YZ plane	G19
G28	Home		
G31	Probe		
G54	G54 coordinate system	Select G54 work piece coordinate system	G54
G55	G55 coordinate system	Select G55 work piece coordinate system	G55
G56	G56 coordinate system	Select G56 work piece coordinate system	G56
G57	G57 coordinate system	Select G57 work piece coordinate system	
G58	G58 coordinate system	Select G58 work piece coordinate system	
G59	G59 coordinate system	Select G59 work piece coordinate system	
G81	Drill hole code		G81 X..Y..Z..R..F..
G82	Drill hole code		G82 X..Y..Z..R..P..F..
G83	Circulation Drill Hole Code		G83 X..Y..Z..R..Q..F..
G90	Absolute size Mode		
G91	Increment size Mode		
G98	Invok sub-program	G98 should work with G99.G98 invok a sub-program from main program.	
G99	Back to main program	G99 should with with G98.G99 set back to the main program after G98 finish its job.	

M Code	Name	Definition
M3	Spindle rotates forward	The set of output control signal for spindle rotates forward is valid
M5	Spindle stop	The set of output control signal for spindle rotates forward is invalid
M8	Start of water -cooling	Arc cutting machining clocThe set of water-cooling output control signal is valid
M9	Stop of water- cooling	The set of water-cooling output control signal is invalid
M10	Start of lubricating oil	Interpolation plane seThe set of lubricating oil output control is valid
M11	Close of the lubricating oil	The set of lubricating oil output control is invalid