

DDUM CARD V1.0 Simple Description (English)



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Chapter 1 Overview

► 1.1 Simply Introduction

DDLMV1 is designed by our Studio, it is a CNC system based mach3.You do not need to add other Hardware, and you can complete the signal conversion from the G-code to the movement of the stepper motor drive control. This card is compatible with most stepper drives and servo drives. And it is perfect weapon to replace mach3 parallel interface board.

>1.2 Requirements of Computer

Basic Configuration:

- 1) CPU: 1GHz
- 2) Memory: 512MB
- 3) 500MB Available disk space
- 4) USB 2.0

Recommended configuration:

- 1) CPU: 2GHz Dual Core;
- 2) Memory: 2GB;
- 3) 1G Available disk space
- 4) USB 2.0

1.3 Appearance and size of product



is invalid, 3axis card s A&B axis are invalid;7. Use FPGA as a Interpolation Chip;8. Use ARM7 of ATMEL as a Master.

1. USB communication interface, and power supply for the board;

2. 12 IO input, opto-isolated, It Can be configured to limit the emergency stop and other functions, 12 of them are 2edg port;

3. adjustable output voltage of main axle;

4. High 8 IO outputs;

5. four general I/O output without optocoupler, can connect the board with relay;

6. 5 axis stepper driver signal output, Remarks: 4axis card s B axis



Figure1-1. Product Outline



Figure1-2. Overall appearance

▶ 1.4 Notes and Cautions



Prohibits the rain, boards for high-performance precision equipment, rain can cause short-circuit.



CAUTION WARNING, various wiring in strict accordance with installation Description document specification.



High risk, boards need to stay away from high-pressure.

Chapter 2 Detailed Features

► 2.1 Electrical parameters

- A. System input voltage5V;
- B. Operating voltage of input interface: 5V;
- C. Operating voltage of output interface: 5V;
- D. stepper motor control signal output voltage: 5V.



NOTE: The marked as Power In is Power input interface, you should connected correctly.

> 2.2 Functions and define of each module



Figure 2-1 Functional modules defined in Figure

A) USB PORT, This interface is connected to the computer through a USB line. You can use the software mach3 to control this board, Note that you should use a USB2.0 cable with shielding and ferrite core, and cable length should be not more than 2 meters.

B) 5V General INPUT PORT,IN1-12,see as Figure 2-2,it is defined as COM, IN01, IN02, IN03,COM, IN04, IN05, IN06, COM, IN07, IN08, IN09, COM, IN10, IN11, IN12 from left to right,

3

The interface uses opto-isolated, using common positive input, COM is used as the common Port. Wiring methods see as Figure 2-2



Figure 2-2 normal Tact limit switch connection

C) Adjustable voltage output of main axle, it needs frequency changer to offer referenced voltage. It is defined as GND, PWM(PWM waveform output),VOUT(0-10V analog quantity output),10VIN(0-10V input, need 10V input from frequency changer).



Figure2-3 main axle output

D) High 8 General IO output interface, Have a current drive capability within 10MA, defined as GND 017, 016, 015, 014, 013, 012, 011, 010, 09, 08, 5V from left to right. See as figure2-4.



Figure 2-4 High 8 General IO output interface

E) general output without optocoupler isolation



Figure 2-5 general IO output

F) 5-axis stepper motor control signal output, defined as CK+\CK-\DIR+\DIR-.There are positive pulse, negative pulse, positive direction, negative direction. These port are common positive connection. Therefore, on the board of CK + and DIR + are linked together to 5V. So this board does not support the common negative connection. Wiring method refer to Figure 2-6.This card doesn t have EN signal, Most drives on sale should not connected to the EN signal. It is defined as $X \setminus Y \setminus Z \setminus A \setminus B$ channel from left to right, see as Figure 2-6.



Figure 2-6 Stepper motor driver connection method

Chapter 3 Software Installation

3.1 MACH3 Install

When you purchase our product, we will supply a CD-ROM, which contains the MACH3 installation, registration, and USB plug-ins. See as Figure 3-1.



First run the installation Mach3Version3.043.066

page. See as Figure 3-2.



. Into the first

Figure 3-2 MACH3 installation process 1

Click Next and then enter the page shown in Figure 3-3.



Figure 3-3 MACH3 installation process 2

Select the consent agreement, click Next, See as Figure 3-4



Figure 3-4 MACH3 installation process 3

Select the installation path, click Next (it can be installed on any disk, and recommended to install the C drive or the D drive) See as Figure 3-5



Figure 3-5 MACH3 installation process 4

Click Next until completion. Then restart the computer.

► 3.2 MACH3 Registration

Copy the file Mach1Lic.dat in The CD-ROM to mach3 installation path (eg C :/ MACH3).







1.0.0.1 DDREAM USBMACH3 PLUGIN to X:\Mach3\PlugIns.

Chapter 4 Software uses





Double-click the mach3mill

Enter mach3 software. Pop-up the plug-in dialog box. See as Figure 4-1.



Figure4-1. Plugin selection dialog

Choose our plugin DDREAM-USBMACH3-PlugIn---Ver-1.0a. Then press OK. If you do not want to the dialog box pop up again next time, you can select Don t ask me this again. If USBmach3 interface board is not properly connected, or other connection fails, the dialog box in Figure 4-2 will appear, Please re-connected properly USBmach3 interface board or contact sales.

Votion Control Hardware Plugin se Your system is showing n Please pick the one you	nsed!! nore than one c would like this p	control device profile to use.
 Normal Printer DDREAM-USE No Device No Device No Device No Device 	USB-MACH3 🔀 设备没有连接 确定	Ver-1.0a
Dont ask me this again		OK

Figure4-2. Not connected correctly

4.2 Software Common settings

DDUM plugin setting



Figure4-3. get in config plugins

nabled	PlugIn Name	Config
2	DDREAM-USBMACH3-PlugInVer-1.Oa	CONFIG
2	DDREAM4-USBMACH3-PlugInVer-1.Oa	CONFIG
1	DDREAM5-USBMACH3-PlugInVer-1.Oa	CONFIG
1	Flash-FlashScreen-SWF-PlugIn-A. FenertyBB	CONFIG
2	JoyStick-JoyStick-PlugInArt-Fenerty-Ver-1.Oa	CONFIG
2	PrinterScope=Port=Scope=1.00.046	CONFIG
K	TurnDiags-Turn-Diags-1.00.1	CONFIG
1	VideoB. Barker-Ver-1.0	CONFIG

Figure4-4. click config

parameter of board	1		performance set	ings	
max driver	frequence: 200		buffer time	200	ms
max d	river axises	axises	pulse width	1	us
andwheel(unavai enable handwheel multi c default multi multi x 1	able yet) handwheel port- port A 1 © export multi X1 0 x10 0 x100 0 x100 0	portB 2 channel X 0 Y 0 Z 0 A 0 B 0			

Figure4-5. config dialog

In this dialog you can change buffer time and plus width. If buffer time is too short, the system will be unstable, or if buffer time is too long, the system s delay will be long. The default setting is 200ms buffer time and 1us pulse width.

Motor operating parameters setting

Pr	Select Native Units Ports and Pins	I (Alt-2) Tool Path (Alt	(-4) Offsets (Alt-5)	Settings (Alt-
R	Motor Tuning General Config			R Zero
	System Hotkeys Homing/Limits ToolPath Slave Axis Backlash Fixtures ToolTable Config Plugins Spindle Pulleys Safe_Z Setup Save Settings			F Zero L Zero H Z M Zero A E 4

Figure4-6. Motor operating parameter setting menu entry

See as Figure 4-3. From submenu motor tuning of the menu config into the motor parameter settings dialog. See as Figure 4-4.



Figure4-7. Motor operating parameter settings dialog

The parameters are defined as follows:

Steps per: Pulse equivalent ,it is number of pulses required with axial movement 1mm, This can be calculated by lead screw pitch and motor drive segment. Such as pitch 2.5mm,2-phase motor 8 segments, Calculation method is 8*200/2.5=640.

Velocity: The speed is the axial velocity, Units is mm/s, Recommended settings 1500.

Acceleration: Units is mm/s2, Recommended settings 200.

Step Pulse: Minimum pulse width, Recommended settings 2.

Dir Pulse: Minimum width direction, Recommended settings 2.

Attention: The parameters for each axis is not necessarily the same, To select the axis, and then set parameters. You should click SAVE AXIS SETTINGS After setting.

Port Settings

	Select Native Units	have at 1	-		
Pr	Ports and Pins	I (Alt-2)	Tool Path (Alt-4)	Offsets (Alt-5)	Settings (Alt-
	Motor Tuning General Config System Hotkeys Homing/Limits ToolPath Slave Axis Backlash Fixtures ToolTable Config Plugins Spindle Pulleys Safe_Z Setup Save Settings				R Zero E Zero L Zero Y Zero M Zero 4 OFFLINE

Figure4-8. Port settings

See as Figure 4-5, Click the sub-menu ports and pins of menu Config into Port Settings dialog box.



Figure4-9. Port Settings dialog box

The sub-pages you need to set include Motor Outputs, Input Signals, Output Signals and Spindle Setup. First Click to enter Motor Outputs. This page is to select the stepper motor control pin. Because our usbmach3 interface board stepper motor signals are fixed, So here only need to Select, no need to select the specific pin. See as Figure4-7

Encoder/MPG's			Spi	T	Mill Options		
fort Se	tup and Axis 5	efection		outputs	Input Signal	.s	Output Signals
Signal	Enabled	Step Pin#	Dir Pin#	Dir LowActive	Step Low Ac	Step Port	Dir Port
X Axis	4	0	0	×	×	1	1
Y Axis	4	0	0	X	X	1	1
Z Axis	4	0	0	8	×	1	1
A Axis	4	0	0	X	×	1	1
B Axis	4	0	0	X	×	1	1
C Axis	×	0	0	X	X	0	0
Spindle	4	o	0	X	X	0	o

Figure4-10. Stepper motor port settings dialog

Port Setu	p and Axis Sel	ection.	Motor Outpu	ıts	Input Signals	0u	tput Signal
Signal	Enabled	Port #	Pin Number	Active Low	Emulated	HotKey	<u>^</u>
X ++	4	1	1	4	X	0	E
х	4	1	2	4	X	0	
X Home	4	1	3	4	X	0	
Y ++	4	1	4	4	X	0	
Y	4	1	5	4	X	0	
Y Home	4	1	6	4	X	0	
Z ++	4	1	7	4	*	0	-
	Pins 10-13 «	and 15 are inp	uts. Only these !	5 pin numbers	may be Automated	l Setup of Ir	aputs

Click Input Signals Into the input signal settings page. See as Figure 4-8



Here you can configure according to your actual needs the corresponding function. Optional Function include XYZAB5axis s Upper and lower limit, XYZAB5axis s HOME point, PROBE, ESTOP, etc. The board has12 input signals in total, Numbers followed 1-12, Customers can choose according to their needs, in accordance with the pin numbers, define the corresponding function.

Click Output Signals to enter the Output signal setting page. See as Figure 4-9

Encod	ler/MPG's	SI SI	pindle Setup		lill Options
Port Setup	and Axis Selection	Motor	Outputs	Input Signals	Output Signals
Signal	Enabled	Port #	Pin Number	Active Low	~
Digit Trig	4	2	1	X	
Enable 1	4	2	2	X	
Enable2	4	2	3	X	
Enable3	4	2	4	X	
Enable4	4	2	5	X	
Enable5	4	2	6	X	
Enable6	4	2	7	X	
Output #1	4	2	8	X	
Output #2	4	2	9	X	
Output #3	4	2	10	<u>×</u>	
I	2ins 2 - 9 , 1, 14, 14	6, and 17 are o	utput pins. No o	ther pin	

Figure4-12. Output Signal Setup dialog

Note that the output signal number from 1-16. Because there is an overlap with the input signal,

We set output signals to the port 2.See as Figure4-9, PORT # All output signal is set to 2.Please put Output signal to the corresponding options as you need.

Click Spindle Setup switch to the spindle settings page. See as Figure4-10.

Port Setup and Axis Selection	Motor Outputs	Input	Signals	Output Signals
Encoder/MPG's	Spindle Setu	ıp		Mill Options
Relay Control Disable Spindle Rel Clockwise Output 1 CCW (M4) Output 2 Output Signal #'s Flood Mist Control Disable Flood/Mist rep _{elay} Mist Output 4 Store output 3 Flood Output 3 Output Signal #'s ModBus Spindle - Use Step/Dir as Enabled Reg 64 Max ADC Count 16380	Motor Control Vuse Spindle Motor Outp PWM Control VStep/Dir Moto PWMBase Freq. 2000 Minimum PWM 0 % General Parameters CW Delay Spin UP 1 CCW Delay Spin UP 1 well Jelay Spin DOWN 1 CCW Delay Spin DOWN 1 CCW Delay Spin DOWN 1	Special Fund Use Spind Closed Lo P 0.25 Spindle S Seconds Seconds Seconds Seconds before d	ctions fle Feedback i pop Spindle Co I I D Speed Averagi Special Option HotWire H Laser Mod Torch Vol Torch Aut	n Sync M nt 0.3 ons, Usually Off eat for J e. fr ts Conts o Of

Figure4-13. Spindle Settings dialog box

Here we can configure the spindle rotates CW, Reverse CCW, Mist, Flood pin, See as Figure4-10, They have been configured as 1, 2, 3, 4. Corresponding to output#1~output#4 in Figure4-11.output#1~output#6 in Output Signal Setup dialog can be Configured into these 4 signals. Here we note correspondence between 2 page. Please select use spindle motor output if required PWM speed spindle. And select PWM Control . Our PWM pin fixedly arranged on board OUTPUT20 pin, it s no need to set.

Encoder	r/MPG's	Sp	oindle Setup		"	lill Options
Port Setup an	d Axis Selection	Motor	Outputs	Input	Signals	Output Signals
Signal	Enabled	Port #	Pin Numbe	r	Active Low	
Enable5	X	2	6		X	
Enable6	X	2	7		X	
Output #1	4	2	8		8	
Output #2	4	2	9		X	
Output #3	4	2	10		X	
Output #4	4	2	11		X	
Output #5	4	2	12		X	
Output #6	4	2	13		2	
Charge Pump	X	1	0		X	
Charge Pump2	X	1	0		X	~
Pi	ns 2 - 9 , 1, 14, 16	ö, and 17 are o	utput pins. No	other pi	n	

Figure 4-14. Spindle setting corresponds to the output configuration

Changzhou RATTM Motor Co.,Ltd http://www.aliexpress.com/store/704350