Mach3 USB Motion Card (STB4100) Installation Manual

V2.1





The motion control card for machine control, with strong professional.Requires the operator to have the relevant expertise!If used improperly, may appear an

accident, please strictly follow the instructions and warnings using this product if you are not sure, consulting engineers for help.First time users, if you are not familiar with the product and software features Mach3 In your test product, make sure the machine's power switch on hand, you can quickly turn off the power. Recommends that users install the emergency stop button and make sure the button is functioning properly. Please strictly follow the instructions and warnings using this product.Any direct / indirect personal injury, our company does not assume any responsibility.

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Features:

- 1. Support for 4-axis linkage, you can connect four stepper motor drives or servo drives;
- 2. Maximum step-pulse frequency is 100KHz, which is suitable for the servo or stepping motor;
- 3. 4 general-purpose opto-couplers isolation input : can connect the limit switch, emergency stop switch, auto tool zero, home switch etc.
- 4. Support for connecting electronic handwheel;
- 5. Have 0-10V signal output, you can use mach3 software to control the spindle motor speed.
- 6. 4 general-purpose isolated relay drive output interface, can drive four relays for controlling the spindle starts, forward rotating and reverse rotating, pumps or other device;
- 7. 1 status LED, indicate connection status on the board.

Basic connection diagram (an Overview):



Mechanical dimensions diagram:



1.Prepare:

1.1.Installation the Mach3:

Open the CD, find mach3 software, run the installation file:

新建文件夹								
名称	修改日期	类型	大小					
🔀 Mach3VersionR3.041	2014/1/10 13:23	应用程序	25,733 KB					

Follow the prompts to install, until the last step.

The last step requires Note: For 64-bit computer, it is best not to select"LoadMach3 Driver "this one, because it will cause the system to prompt installation errors.



1.2.Software license application:

Copy license files "Mach1Lic.dat" from "mach3 software folder",to C:\Mach3 Cover the original file,Reset Computer (must reset the computr,please don't open the software dircetly!) Way above the license for DIY or study purposes only, not for commercial use.

1.3. Installation the software of the USB motion card:

This USB motion card does not need install any USB driver, Windows 2000/XP/Windows 7, can directly identify.

1.3.1 Connecting the USB cable to the PC and the motion card:

The first installation of motion control card, take about 10s, when the green led lights on motion control card, indicating that the connection is successful, return the following tips when you install on your computer:



1.3.2 Installing the motion card plug-in.

Unzip the usb move.zip, copy or drag RnRMotion.dll into your Mach3\PlugIns folder.

共享 ▼	新建文件夹							
	名称			修改日期		类型	大小	
	Flash			2008/3/5 1	3:20	DLL 文件	1,069 KB	
	JoyStick			2007/9/5 1	7:33	DLL 文件	180 KB	
	Probing			2007/12/30	13:42	DLL 文件	272 KB	
	🔳 usbMove			2015/3/19	17:03	DLL 文件	266 KB	
	Video		1	2007/9/21	0:57	DLL 文件	304 KB	
、	は 辑(D) 查看(V) 工具(O) 解示到 測试 計		的鬼妻 Sal 緊助()) ((②			
、(4)(E) 编 (中)(E) 编 添加	報回 音看(V) I具(Q) 解圧到 測试 計	■用/主服へ) 选项(Z) ≢ ■除 う sb move.p	的兄妻 M 帮助(U) 伐 信	D 译 息 修复	「注释	自解压		
 (件(E) 编 添加 ◆ 名称 	線(2) = 20455 (広) 「早日 環(D) 查看(V) 「貝(D) 「「「「」」 解圧到 測试 計 ▼ ゆ 第三 ▼ 「」」 1000	A用产量吸入 第二項(Z) 非 ● ○ ○ ○ ○ ○ ○ ○ ○ ○ ○ ○ ○ ○ ○ ○ ○ ○ ○ ○	的兄弟子Sall 響助(り 成 信 \usb mov	##X1+ 記 記 修复 正缩后大小	注释	自解压	修改时间	CRC32
 C件(E) 编 添加 ◆ 名称 ▲ -(上层) 	(42.1) - 2.34 (5) IL (1) 環(D) 查看(V) IL (0) 解圧到 測试 H ▼ 診 部 ▼ 10 us	mp ⁻ 呈成入 一 一 一 一 一 二 の 、 一 二 の 、 一 二 取 (乙) 非 一 一 一 の 、 一 の 、 一 の の 、 一 の の の の し 、 つ の の の の の の の の の の の の の	的兄弟子Sall 響助(U) 成 信 \usb mov	1111 111 1111 1111 1111 1111 1111 111	 注释 类型 	自解压	修改时间	CRC32

1.3.3 Start the Mach3 software, a dialogue of "Motion Control Hardware PlugIn sensed!" is shown. Please select the" RnRMotionControllerECO-V2.0", you can also check"Don't ask me this again".

2.config for mach3:

2.1 Mach3 X、Y、Z、 A Axis config as shown below: Config => Ports and Pins):

-			52								
Eng	gine Contigur	ation Ports &	Pins	to	set low	signal leve	els				
	Encoder/MPG's Mill Options										
	Port Setu	up and Axis Sel	lection	Motor (Input Signa	ls	Output Signals			
	Signal	Enabled	Step Pin#	Dir Pin#	Di Ac.	Step Low	Step Port	Dir Port			
	X Axis	4	0	0	4	4	0	0			
	Y Axis	4	0	0	4	4	0	0			
	Z Axis	4	0	0	4	4	0	0			
	A Axis	4	0	0	4	4	0	0			
Dick	tick " /"	X	0	0	×	X	0	0			
		J 🗶	0	0	X	X	0	0			
	Spindle	4	1	1	ia:	a.	0	0			
	After setting, click "Apply" to save the setting results										
_						确定	Ē 取:	消 <u></u> 应用(A)			



2.2 Motor tuning setup as shown below: (Config => Motor Tuning)

2.3 The Mach3 Menu => Config => Homing/Limits dialog:

			Entries ar	e in setup un	its.				
Axis	Reversed	Soft Max	Soft Min	Slow Z	Home	Home	Auto Z	Speed %	
X		100.00	-100.00	1.00	0.0000	4	4	20	
Y		100.00	-100.00	1.00	0.0000	4	4	20	
Z		100.00	-100.00	1.00	0.0000	4	4	20	
A	*	100.00	-100.00	1.00	0.0000	4	4	20	
В			-100.00	1.00	0.0000	X	4	20	
С	X	Axis direc	tion:	.00	0.0000	×	4	20	
G28 home location cod X = 0 Y = 0 Z = 0									

Axis direction, depends on the "Reversed"

2.4 Setup the input signal:

There are 4 general-purpose input channels. The channels number is from 11 to 14.

Example of input signal settings: 11 is connected to emergency stop switch, 12 is connected to 4 axis limit switches, 13 is connected to 4 axis home switches, 14 is connected to auto tool zero, set as shown

Enco	der/MPG's	1	Spindle	Setup	1	Mill Optio	ns		
Port Setup	and Axis Sele	tion	Motor Outpu	its	Input Signals	Outp	ut Signal		
Signal	Enabled	Port #	Pin Number	Active Low	Emulated	HotKey	<u>-</u>		
X ++	4	3	2	*	×	0			
X	4	3	2	*	X	0			
X Home	4	3	3	*	X	0			
Y ++	4	3	2	×	×	0			
Y	4	3	2	*	X	0			
Y Home	4	3	3	×	×	0			
Z ++	4	3	2	×	X	0			
Z	4	3	2	×	×	0			
Z Home	4	3	3	×	×	0			
A ++	4	3	2	×	X	0			
A	4	3	2	×	×	0			
A Home	4	3	3	×	*	0			
B ++	*	0	0	×	*	0			
B	*	0	0	×	*	0			
B Home	*	0	0	×	*	0			
C ++	*	0	0	X	×	0			
C	*	0	0	×	8	0			
C Home	8	0	0	×	8	0			
Input #1	*	0	0	×	8	0			
Input #2	2	0	0	X	×	0			
Input #3	×	0	0	×	×	0			
Input #4	×	0	0	×	×	0			
Probe	4	3	4	×	×	0			
Index	×	0	0	×	×	0			
Limit Ovrd	×	0	0	×	×	0			
EStop	4	3	1	×	×	0			
Pins 10-13 and 15 are inputs. Only these 5 pin numbers may be Automated Setup of Inputs									
							-		

below:

2.5 Setup the Output signals:

There are 4 general-purpose (open-drain) output channels, The channels number is from O1 to

O4, mach3 setup as shown below:



M3 code control output 1 output, M4 code control output port 2 output, M5 shut down output 1 and output2.

M7 code control output 3 output, M8 code control output port 4 output, M9 shut down output 1 and output2.

2.6 Spindle speed control (0-10V) Setup:

There is 0-10v signal output on the control card, Can be used to connect the Inverter to control

the spindle speed.

According to the actual parameters of the inverter and the spindle, set the maximum spindle

speed (for example,24000RPM). As shown below: The Mach3 Menu => Config => Spindle pulleys:



Setup Spindle parameters: as shown in the red box

Engine Configuration Ports & Pins	1 100				
Port Setup and Axis Selection Encoder/WFG's Relay Control Disable Spindle Rel Clockwise Output 1 CCW (M4) Output 2 Output Signal #'s Flood Mist Control	Motor Outputs Spin II - Satur Motor Control	Input Signals 0utput Signals P Mill Options -Special Functions Use Spindle Feedback in Sync M Closed Loop Spindle Cont P [0.25] I [1] D [0.3] Spindle Speed Averagi			
Mist Output 3 0 Flood Output 4 0 Output Signal #'s ModBus Spindle - Use Step/Dir as Fanbled Reg 64 64 - Max ADC Count 16380	General Parameters CW Delay Spin UP 1 Se CCW Delay Spin UP 1 Se wellDelay Spin DOWN 1 Se CCW Delay Spin DOWN 1 Se Immediate Relay off befor	Special Options, Usually Off conds Laser Mode. fr conds Torch Volts Conty conds Special Options, Usually Off Laser Mode. fr Torch Volts Conty conds re d			
		确定 取消 应用(A)			

Enable spindle output. as shown below:

En Baut Sata	.coder/MPG's	1	Spin Mater O	ndle Setup		Mill Options			
fort Sett	up and Axis Se	Lection	motor o	acputs	input Signal	LS	Output Signal		
Signal	Enabled	Step Pin#	Dir Pin#	Dir LowAc	Step Low	Step Port	Dir Port		
X Axis	4	0	0	4	4	0	0		
Y Axis	4	0	0	4	4	0	0		
Z Axis	4	0	0	4	4	0	0		
A Axis	4	0	0	4	4	0	0		
B Axis	×	0	0	X	X	0	0		
C Axis	×	0	0	X	X	Q	0		
Spindle	4	1	1	X	X	0	0		
					- 4-				

Completion of the setting, there are two ways to control the output value of 0 ~ 10V.

1. Using the S command. Such as S20000 (the speed to 20000RPM)

2. Using the Mach3 interface control (input Spindle Speed, and adjust Percentage SRO's). Figure:



2.6 Mach3 MPG Setup:

Note: The electronic handwheel selection 5V voltage output models, more than 5V output will

damage the hand wheel interface, refer to the following wiring diagram:



Mach3 MPG Setup:

The Mach3 Menu => Config =>Ports and Pins=>Encoder/MPG'S

Engi	ne Configura	ation Ports	& Pins	7				<u>3</u>	
	Port Setu Enc	p and Axis S coder/MPG's	election	Mot	or Outputs Spindle Set	Ing up	out Signals	Output Signals Mill Options	
	Signal	Enabled	A -Port #	A -Pin #	B -Port #	B-Pin #	Counts/	Velocity	
	Encoder1	×	0	0	0	0	1.000000	100.0000	
	Encoder2	X	0	0	0	0	1.000000	100.0000	
	Encoder3	×	0	0	0	0	1.000000	100.0000	
	Encoder4	X	0	0	0	0	1.000000	100.0000	
	MPG #1	4	0	0	0	0	1.000000	100.0000	
	MPG #2	X	0	0	0	0	1.000000	100.0000	
ſ	MPG #3 Pick tic	k "√"	0	0	After setting, click "Apply" to save the setting results				
							确定	取消 <u>世界</u> (A)	

Press the "Tab" key on your keyboard, to bring up the "MPG MODE" mach3:



Click the "Jog mode" select MPG mode, you can use the electronic handwheel control the motor run.