MACH3 5 axis CNC interface board instruction



Functions and Features:

1. Completely support MACH3 and the other softs that use LPT port.

2. USB Power supply and external power supply separate, for protecting your PC.

3.Wide range external power supply voltage $\,$, 12 - 24V, and has preventing reverse connection function $_{\circ}$

4. All the input signals are separated by photocouplers, can be connected to Estop. Probe and Limit switchs. To make your computer safe.

5. One relay output , can be conneted to spindle switch. Using P17.

6. 0-10V photocoupler separated analog voltage output, can be connected to Frequency converter, using to control the spindle speed. Using P1.

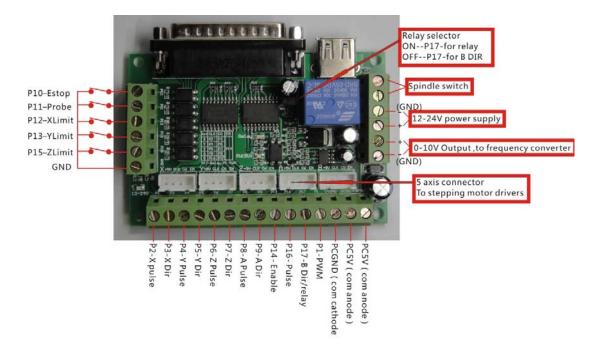
7、All 17 LPT ports are available, can be connected to stepping motor drivers, can control five stepping motor.

8、P1 can be used to output PWM signal, and can control the spindle Speed Regulator that has a photocoupler for input.

9. Can be connected to stepping motor drivers using common anode or common cathode input connection.

10、All of the LPT port names are printed on board, Easy to be used.

Funtion Wiring diagram:



Note: all the stetings below is for common anode connection between this interface board and the stepping motor drivlers.

MACH3 soft setting:

A. First check MACH3 driver is install well:



note: "Mach3 Driver" can't has "!" or "? ".

B_{\times} Soft setting:

| Set Default Units for Se 🔀 |
|---|
| Units for Motor Setup Dialog MM's C Inches OK |

BlueSky_TEC Mach3 5 axis CNC interface board (BL-MACH-V1.1) instruction

2 **Ports and pins:**

(1), Port setup and axis selection: note--make sure you have save your changes.

| Engine Configuration Ports & Pins | X X |
|---|--|
| | e Setup Mill Options |
| Port Setup and Axis Selection Motor Outp Port #1 V Fort Enable: Ox378 Port Entry in Hex 0-9 Port #2 Ox278 Port Entry in Hex 0-9 Pins 2-9 as inp | puts Input Signals Output Signals OR MaxNC Mode Max CL Mode enabled Max NC-10 Wave Drive Program restart Restart if changed Sherline 1/2 Pulse mov |
| Kernel Speed | │ ModBus InputQutput Suppo │ ModBus PlugIn Supporte∃ |
| C 65000hz C 75000hz C 100khz | TCP Modbus support |
| Note: Software must be restarted and motors kernel speed is | ☐ Event Driven Serial Cou ☐ Servo Serial Link Feedb: |
| | |
| | 确定 取消 应用 (A) |

(2), Motor outputs: set as the below diagram.

| | .coder/MPG's 1p and Axis Se | lection | Spin Motor O | ndle Setup utputs | Input Signal | |)ptions Output Signals |
|---------|--------------------------------|-----------|-----------------|----------------------|------------------|-----------|---------------------------|
| Signal | Enabled | Step Pin# | Dir Pin# | Dir LowAc | Step Low | Step Port | Dir Port |
| X Axis | 4 | 2 | 3 | 4 | 4 | 1 | 1 |
| Y Axis | 4 | 4 | 5 | 4 | 4 | 1 | 1 |
| Z Axis | 4 | 6 | 7 | 4 | 4 | 1 | 1 |
| A Axis | 4 | 8 | 9 | 4 | 4 | 1 | 1 |
| B Axis | × | 16 | 17 | 4 | 4 | 0 | 0 |
| C Axis | × | 0 | 0 | X | X | 0 | 0 |
| Spindle | 4 | 1 | 0 | 4 | 4 | 1 | 1 |
| | | | | | | | |
| | | | | | | | |

note: the motor turning direction is relevant to its connection $\$, if the direction is not right, you can adjust "Dir LowActive" as on the diagram.

(3), input signals: set as below, then click the "confirm" button.

BlueSky_TEC Mach3 5 axis CNC interface board (BL-MACH-V1.1) instruction

| | coder/MPG's p and Axis Sel | ection | Spindle Motor Outpu | | Input Signals | Mill Op Ov | itput Signals |
|--------|-------------------------------|----------------|------------------------|---------------|---------------|---------------|---------------|
| Signal | Enabled | Port # | Pin Number | Active Low | Emulated | HotKey | ^ |
| X ++ | 4 | 1 | 12 | 4 | X | 0 | |
| Х | 4 | 1 | 12 | 4 | X | 0 | |
| X Home | X | 0 | 0 | X | × | 0 | _ |
| Y ++ | 4 | 1 | 13 | 4 | × | 0 | _ |
| Y | 4 | 1 | 13 | 4 | X | 0 | |
| Y Home | X | 0 | 0 | X | X | 0 | |
| Z ++ | 4 | 1 | 15 | 4 | * | 0 | - |
| | Pins 10-13 a | and 15 are ing | outs. Only these ! | 5 pin numbers | | l Setup of In | nputs |

| | oder/MPG's 9 and Axis Sel | ection | Spindle Motor Outp | | Input Signals | Mill Op Ou | tions tput Signals |
|------------|------------------------------|--------|-----------------------|------------|-------------------|---------------|-----------------------|
| Signal | Enabled | Port # | Pin Number | Active Low | Emulated | HotKey | ^ |
| Input #3 | X | 0 | 0 | X | X | 0 | |
| Input #4 | × | 0 | 0 | X | X | 0 | |
| Probe | 4 | 1 | 11 | 4 | X | 0 | |
| Index | × | 0 | 0 | X | X | 0 | |
| Limit Ovrd | X | 0 | 0 | X | X | 0 | |
| EStop | 4 | 1 | 10 | 4 | X | 0 | |
| THC On | X | 0 | 0 | X | X | 0 | _ |
| | | 0 | | | may be | - | |

(4), Output signals: set as below, then click the "confirm" button.

| | er/MPG's | | indle Setup | | 11 Options |
|--------------|-----------------------|-----------------|----------------------|------------|----------------|
| Port Setup a | nd Axis Selection | Motor | Outputs Inp | ut Signals | Output Signals |
| Signal | Enabled | Port # | Pin Number | Active Low | * |
| Enable1 | 4 | 1 | 14 | X | = |
| Enable2 | * | 0 | 0 | X | |
| Enable3 | × | 0 | 0 | X | |
| Enable4 | × | 0 | 0 | X | |
| Enable5 | * | 0 | 0 | X | |
| Enable6 | × | 0 | 0 | X | |
| Output #1 | 4 | 1 | 17 | X | |
| Output #2 | 2 | 0 | 0 | 2 | - |
| P | ins 2 - 9 , 1, 14, 16 | , and 17 are ou | itput pins. No other | pin | |
| | | | | | |
| | | | | | |

Enable1: setpping motor enable setting。 --p14 Output #1: spindle relay switch setting。 --P17

(5), Spindle setup:

| Engine Configuration Ports & Pins | | X |
|--|---|---|
| Port Setup and Axis Selection Encoder/MPG's | Spindle Setup | Signals Output Signals Mill Options |
| Relay Control Disable Spindle Rel Clockwise Output 1 CCW (M4) Output 1 Output Signal #'s Flood Mist Control Disable Flood/Mist repelay Mist Output 4 Plood Output 3 Output Signal #'s ModBus Spindle - Use Step/Dir as Enabled Reg 64 64 - Max ADC Count 16380 | ✓ Use Spindle Motor Outi ✓ Use Spindle Closed Lo ✓ PWM Control ○ Closed Lo Step/Dir Moto P 0.25 FWMBase Freq. 100 Minimum PWM 0 General Parameters 1 CW Delay Spin UP 1 Seconds 5 | le Feedback in Sync M op Spindle Cont I 1 D 0.3 |
| | | |

Using PWM to control the spindle speed, also need to set "spindle pulleys" as below:

| Pulley Selection | and the second | | X | |
|------------------|----------------|-------------|------------|---------------------------------|
| Current Pulley | Min Speed | Max Speed | Ratio | |
| Pulley Number 1 | • 0 | 24000 | 1 | |
| Reversed | | | | |
| | | | ОК | 1 |
| BlueSky TEC | Mach3 5 a | axis CNC ir | terface bo | ard (BI -MACH-V1 1) instruction |

3 Motor turning:

This is relate to the screw pitch and the excitation mode of the motor driver. The below diagram seting is base on 5MM screw pitch and excitation mode is 8.



"Steps per" means how many steps it need for moving 1 MM.

The setting of $Y_{\lambda} Z_{\lambda}$ A axis is similar to X, and have to save the settings after all.

4. System hotkeys setup:

| System HotKeys Setup | - I I I I I I I I I I I I I I I I I I I |
|----------------------------------|---|
| | External Buttons - OEM Codes |
| Jog Hotkeys ScanCode ScanCode | Trigger # OEM Code |
| X++ 39 X 37 | 1 -1 8 -1 |
| | 2 .1 9 .1 |
| Z++ 33 Z- 34 | 3 .1 10 .1 |
| | 4 -1 11 -1 5 .1 12 .1 |

Set the hotkeys of $X_{x}Y_{x}Z$ axis as this diagram, then you can control the motors by this hotkeys on the keyboard.

BlueSky_TEC Mach3 5 axis CNC interface board (BL-MACH-V1.1) instruction