

**UNIVELOP Four/Five Axis CNC Driver Board V1.0 Users Manual**

# **Four/Five Axis CNC Driver Users Manual**

Revision 1.0

**Univelop Comp. Tech. LLC.**  
<http://www.cncgeeker.com>

June 14, 2007

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1

# UNIVELOP Four/Five Axis CNC Driver Board V1.0 Users Manual

## Content

1. GENERAL INFORMATION .....	3
1.1. Scope.....	3
1.2. General Description .....	3
1.3. Features .....	3
2. Descriptions of 4/5-AXIS CNC Board .....	3
2.1. Photo of 4/5-AXIS CNC Boards.....	3
2.2. Key Features .....	4
2.3. Electrical Characteristics .....	4
3. Hardware Installation.....	5
3.1. Board Connection .....	5
3.2. Board Configuration .....	6
3.3. CONNECTING POWER SUPPLY TO DRIVE BOARD .....	7
3.4. SELECTING AND CONNECTING STEPPER MOTORS.....	7
3.5. CONNECTING with Computer by DB25 .....	8
3.6. Manual Control (Optional) .....	9
3.7. Limit Signals.....	9
3.8. Setup Checklist .....	10

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## 1. GENERAL INFORMATION

### 1.1. Scope

This document describes the basic functionality and the electrical specifications of Univelop Tech. LLC's Four Axis CNC Driver Board.

### 1.2. General Description

Univelop Tech. LLC's Four Axis CNC Driver Board is designed to communicate directly with KCAM4, MACH, NINOS, etc..., which supports parallel port.

### 1.3. Features

- Supports KCAM4, MACH, NINOS, etc...
- Two phase bipolar (chopper) pulse width modulating technology
- Resolution 1, 1/2, 1/4, 1/8 micro stepping output
- Suitable for 4, 6, or 8 wire motors
- Maximum 36VDC @ 2.5 amps/phase motor output
- Stop Button for emergency stop
- Limit/Home Signal input
- Manual Control Module is available (Optional)
- Step Current® Technology is included
- Discrete board design

## 2. Descriptions of 4/5-AXIS CNC Board

### 2.1. Photo of 4/5-AXIS CNC Boards

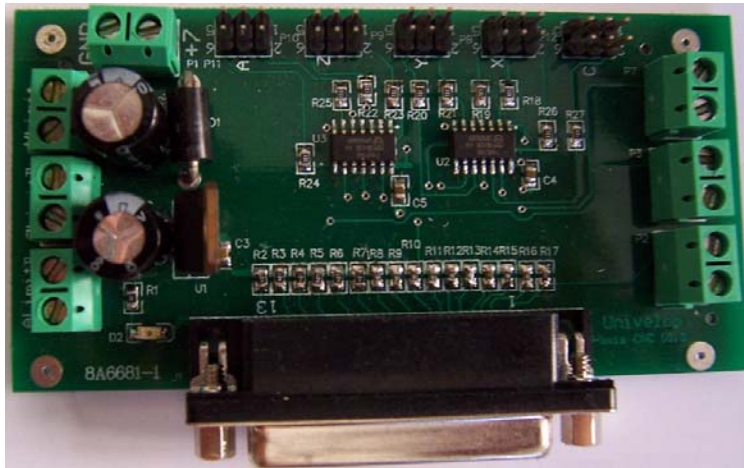


Fig. 1 Four/Five Axis CNC Interface Board  
Dimension: 100mm X 50mm.

## UNIVELOP Four/Five Axis CNC Driver Board V1.0 Users Manual

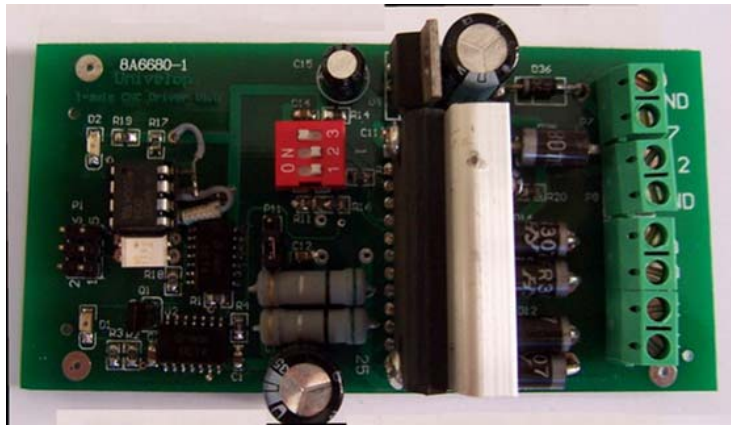


Fig. 2 1-Axis CNC Driver Board  
Dimension: 100mm X 50mm.

### 2.2. Key Features

- Supports KCAM4, MACH2, MACH3, NINOS, etc...
- Two phase bipolar (chopper) pulse width modulating technology
- Resolution 1, 1/2, 1/4, 1/8 micro stepping output
- Suitable for 4, 6, or 8 wire motors
- Maximum 36VDC @ 2.5 amps/phase motor output
- Stop button for emergency stop
- Limit/Home Signal input
- Manual Control circuit (optional)
- 1KV, 10 Mbps high speed Optocoupler for full elimination to protect Computer and driver board.
- Step Current® Technology included: : Step Current® technology is used to decrease the current upto 1/2, when motors are in idle for all axis so as to protect expensive step motor and driver board for long time running.

### 2.3. Electrical Characteristics

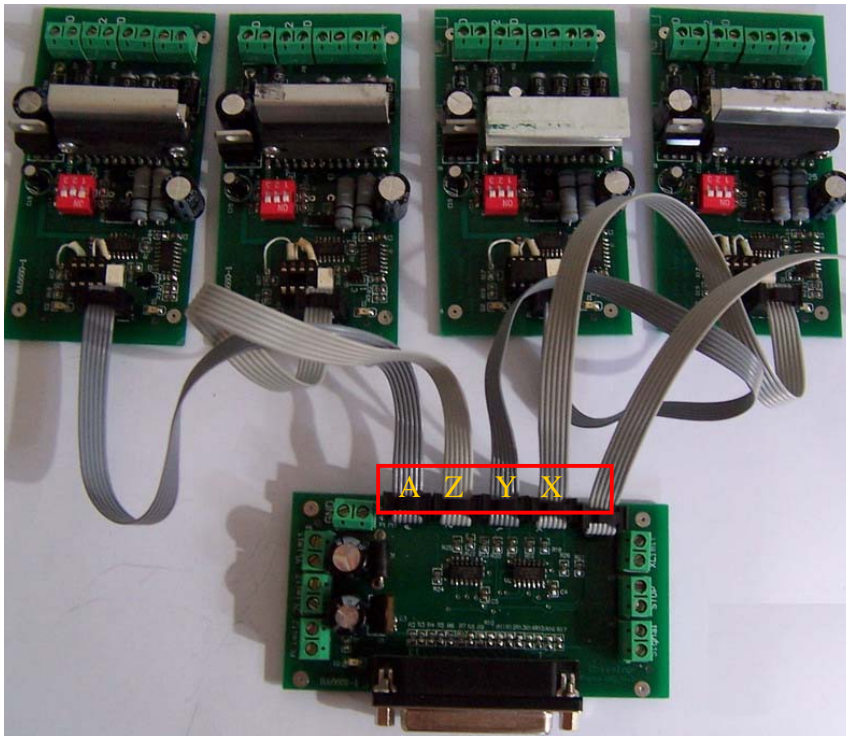
Symbol	Parameter	Min	Typical	Max	Units
$T_{STR}$	Storage Temperature	- 40		+150	°C
$T_{OP}$	Working Temperature	- 15	+ 25	+ 85	°C
$I_{CC}$	Current	50	100	200	MA
+12V	Motor Voltage	5	24	36	V
+7V	Board Voltage	7	9	12	V

### 3. Hardware Installation

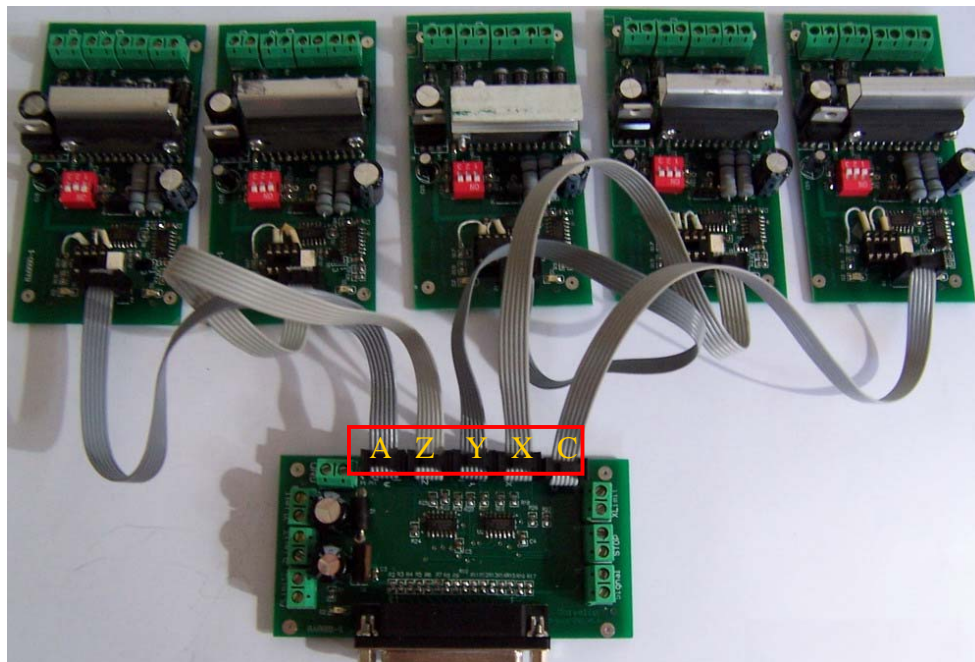
#### 3.1. Board Connection

Use four 6-pin cables to connect the interface board and four 1-axis driver boards, if it is 4-axis CNC driver module. Use five 6-pin cables to connect the interface board and five 1-axis driver boards, if it is 5-axis CNC driver module.

4-Axis Connection:

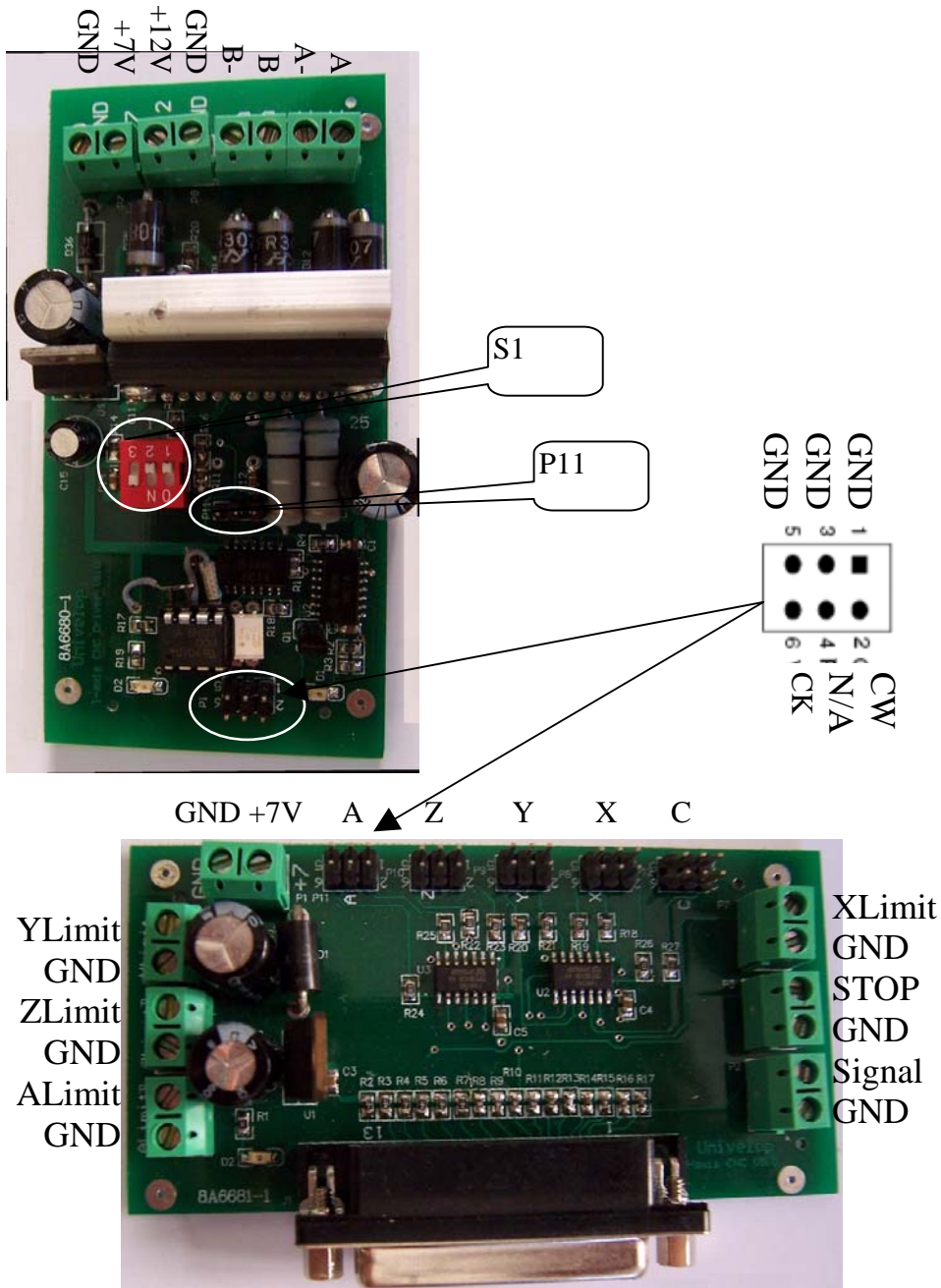


5-Axis Connection





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## 3.2. Board Configuration

1-Axis CNC Driver Board:

S1: 1,2 Micro Step Setup:

S1-1	S1-2	Step/i
OFF	OFF	8
ON	OFF	4
OFF	ON	2
ON	ON	1

\*Original positions are all ON.

## UNIVELOP Four/Five Axis CNC Driver Board V1.0 Users Manual

S1: 3 Enable Axis Board

S1-3	
ON	ENABLE
OFF	DISABLE

\*Original position is ON.

P11: Step Current® Technique:

P11	
3-2	Step Current
1-2	Normal

### 3.3. CONNECTING POWER SUPPLY TO DRIVE BOARD

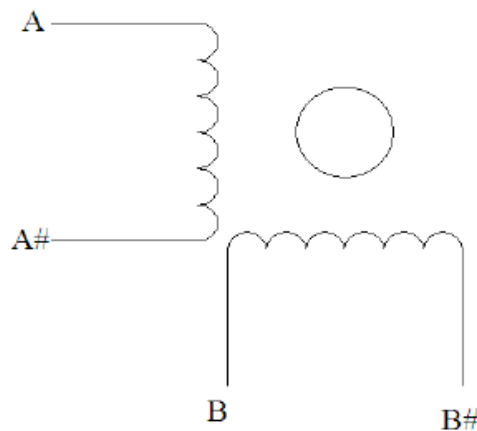
1. Connect suitable power supply at Input outlet on front of controller  
+7V and GND is connected with a power supply with >+7V and 1amp.  
+12V and GND is connected with a power supply with >+12V and 1-6amp. 12-36v DC @ 2-6amp switching power supply recommended

### 3.4. SELECTING AND CONNECTING STEPPER MOTORS

**WARNING: INCORRECT WIRING OF THE STEPPER MOTOR TO THE DRIVE BOARD CAN LEAD TO IMMEDIATE DAMAGE OF DRIVE BOARD - DO NOT CONNECT OR DISCONNECT MOTORS WHILE POWER IS ON**

4 Wire, 6 Wire, and 8 Wire stepper motors can be used with 3-AXIS CNC Board. 4 Wire motors are recommended as they are by their manufacture true bipolar motors and easier to properly connect to stepper motor drive controller It is critical to obtain a proper motor coil diagram of any motor you wish to utilize (making cross connections between the two coils will destroy the control circuitry) 1.8 deg per step resolution is the industry standard for most automation grade stepper motors and is recommended for most applications

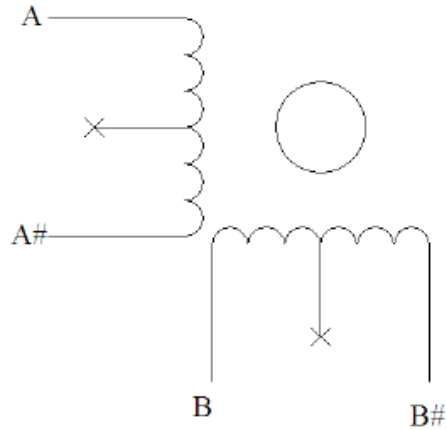
#### 4 WIRE STEPPER DIAGRAM



Each wire is connected to its corresponding terminal block location (i.e. A# wire is connected at A-location)

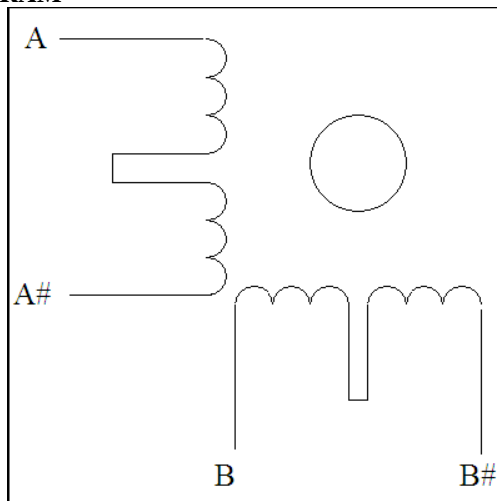
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## 6 WIRE STEPPER DIAGRAM (SERIES WIRING)



Center wire of each coil not connected (insulate termination)  
Remaining wires are connected to their corresponding terminal block location (i.e. A# wire is connected at A- location).

## 8 WIRE STEPPER DIAGRAM



2 center wires of each coil connected (insulate connection) Remaining wires are connected to their corresponding terminal block location (i.e. A# wire is connected at A- location).

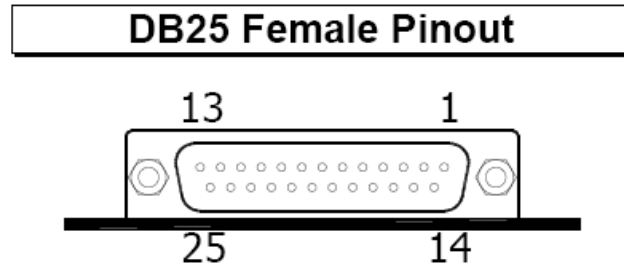
If using 6 or 8 wire motors, connected using series wiring method, reduce labeled amperage rating by **50%** (i.e. a motor rated at 4 amps should thus be considered now rated at 2 amps)

## 3.5. CONNECTING with Computer by DB25

The following is to aid in the setup of the use of controller with various CAM software programs operating on your computer.



## UNIVELop Four/Five Axis CNC Driver Board V1.0 Users Manual



### DB25 PIN USAGE:

#### 4 Axis Configurations

	X	Y	Z	A
CK (out)	2	4	6	8
CW/CCW (out)	3	5	7	9
Limit (in)	15	11	12	13
Stop (in)	10			

\* Pins 18-25 of DB25 are GND.

#### 5 Axis Configurations

	X	Y	Z	A	C
CK (out)	2	4	6	8	17
CW/CCW (out)	3	5	7	9	16
Limit (in)	15	11	12	13	
Stop (in)	10				

\* Pins 18-25 of DB25 are GND.

It is critical that the connection between computer parallel port and motor drive board be direct with the use of adapters (If your computer does not feature a DB25 outlet, you must install one, (these can be achieved via PCMCIA cards on laptop computers)) The use of adapters and hubs is not advisable and most likely will not work.

### 3.6. Manual Control (Optional)

#### 3.7. Limit Signals

P2: Option Signal Input

P3: Emergence Stop

P4: Limit A

P5: Limit Z

P6: Limit Y

P7: Limit X

## UNIVELOP Four/Five Axis CNC Driver Board V1.0 Users Manual

	X	Y	Z	A	C
Limit (in)	15	11	12	13	
Stop (in)	10				

### 3.8. Setup Checklist

- Setup output pin configuration on chosen control software.
- Setup pins in the boards
- Connect power supply to stepper board (make sure power is turned off)
- Connect stepper motors
- Connect Parallel cable between computer and controller
- Turn power on
- Attempt to jog each axis with software (if axis turns in opposite direction of desired direction - attempt axis rotation reversal via software- if unable to do so switch 2 wires for one coil (i.e. switch A with A#, do not switch wires between coils)
- You are now done and able to begin using your new stepper motor drive
- **REMEMBER NEVER CONNECT OR DISCONNECT MOTORS WHILE POWER IS ON**