



USER'S MANUAL

CNC Servomotor Control Box For Router Tables. CS4PA0-2 Rev. 1

September, 2011

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TABLE OF CONTENTS

Page #

Contents

1.0	FEATURES	1-1
2.0	SPECIFICATIONS	2-1
3.0	SYSTEM REQUIREMENTS	3-1
4.0	WARNING	4-1
5.0	CONTROL BOX DESCRIPTION	5-2
5.1	Back Panel Description	5-2
5.2	Internal Layout	5-3
6.0	QUICK START (STEP by step)	6-4
6.1	Step 1. Connecting Motor Armature cables	6-4
6.2	Step 3. Connecting Limit switches Board	6-4
6.3	Step 3. Connecting VFD	6-6
6.4	Step 4. Vacuum/ Coolant	6-6
6.5	Step 5. Connecting Probe	6-7
6.6	Step 6. Selecting the AC operating voltage	6-8
6.7	Step 7. Software Installation	6-9
6.8	Step 8. Configuring the Stepper Motor Drivers	6-9
7.0	WIRING DIAGRAMS	7-10
8.0	PART LIST	8-11
9.0	DISCLAIMER	9-11

1.0 FEATURES

- **Parallel port controlled CNC Stepper Control Box with microstepping.**
- **4 Stepper Motor.**
- **Suitable for a wide range of stepping motors of Nema 17 and 23.**
- **Up to 3A per Phase.**
- **RJ45 Interface for VFD control (Variable Analog Output and relay contact).**
- **Relay Controlled Coolant/Vacuum AC Plug.**
- **1 Probe input. (Probe not included)**
- **RJ45 interface for easy Limits and encoder connection.**
- **Works directly with Mach3.**

2.0 SPECIFICATIONS

Main Voltage Input (VAC)	110V or 220V - Switch selectable
Main voltage for motors (VDC)	36V or 48V
Logic supply voltage (VDC)	5V and 12V
Peak Current per axis (A)	3 Amp per Phase
Step input frequency	0-100KHz
Digital inputs (LOW)	-0.5V - 0.8V
Digital inputs (HIGH)	2V-5V
Coolant/Vacuums output	110VAC@10A or 220VAC@10A
Cooling	1 DC fan
Dimensions (in) / (mm)	17x13.27x4.88/432x337x124
Weight (lbs) / (kg)	

3.0 SYSTEM REQUIREMENTS

Processor	1Ghz CPU
Memory	512
USB	1.1 or 2.0
Operating System	Windows 2000, Windows XP, Windows Vista, or Windows 7
Software	Mach3 Version R3.042.040

4.0 WARNING



Electrical shock or serious physical injury could result due to misuse Control BOX.

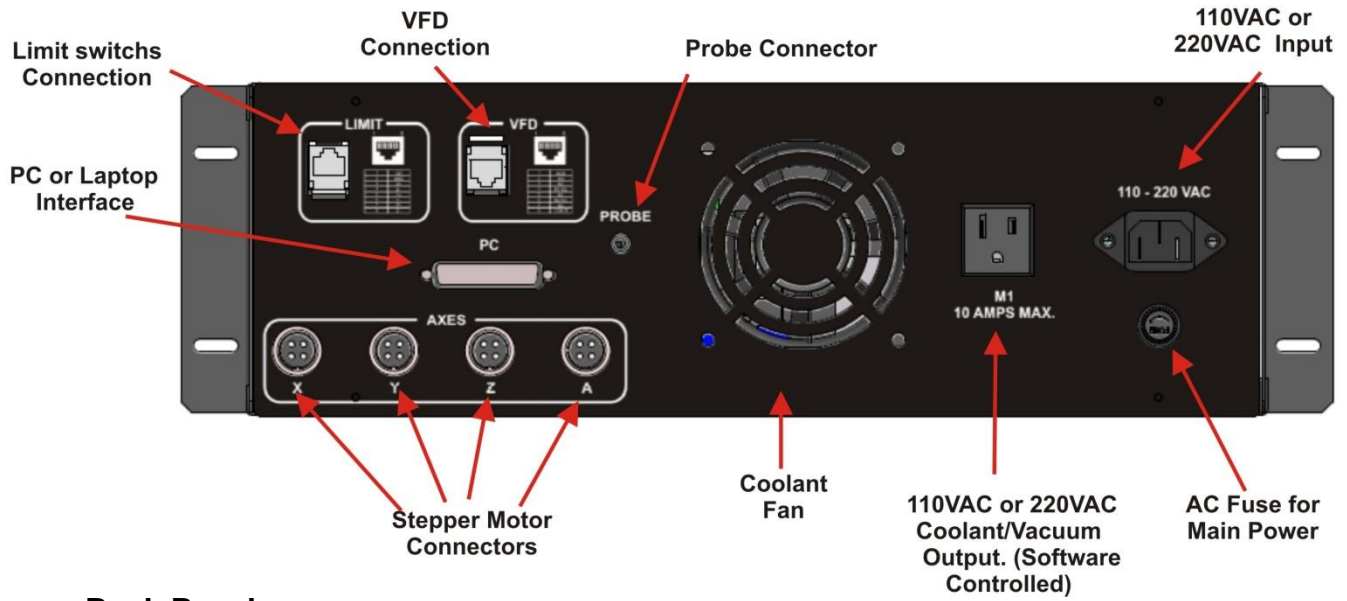
Disconnect power cables while installing the Control Box.



Read and follow instructions on the manual.

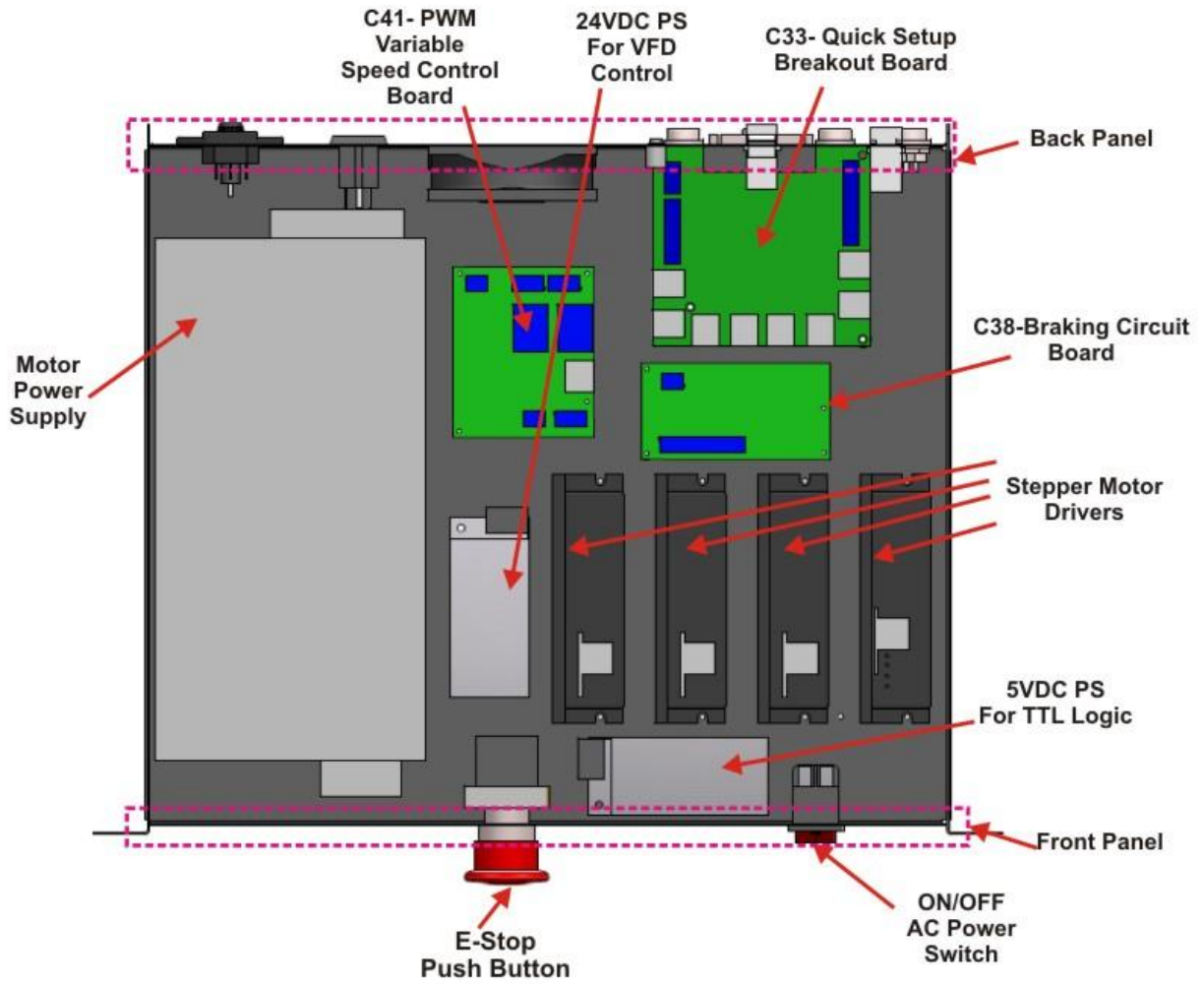
5.0 CONTROL BOX DESCRIPTION

5.1 Back Panel Description



Back Panel.

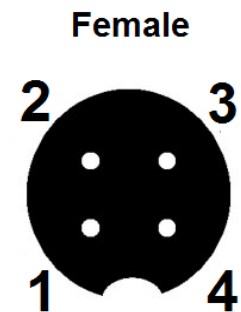
5.2 Internal Layout



6.0 QUICK START (STEP BY STEP)

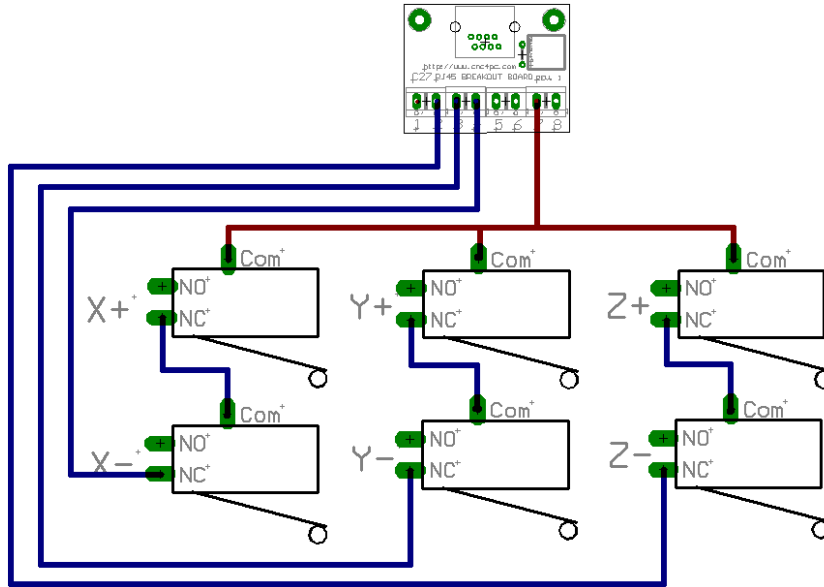
6.1 Step 1. Connecting Motor Armature cables.

STEPPER MOTOR CABLE		
PIN	DESCRIPTION	WIRE COLOR
1	A+	RED
2	A-	WHITE
3	B+	BLACK
4	B-	GREEN



6.2 Step 3. Connecting Limit switches Board.

LIMIT SWITCHS CONNECTOR	
RJ45 PIN	DESCRIPTION
1	GND
2	Z HOME/LIMIT
3	Y HOME/LIMIT
4	X HOME/LIMIT
5	NOT USED
6	NOT USED
7	5V
8	NOT USED



Sample Wiring.

Wiring is made to work with an A32 Switch Assembly, C16 – Photo and Limit Board or a C45 LIMIT AND HOME UNIVERSAL, which could take any kind of switches, including inductive, capacitive, hall effect, optical, or mechanical.

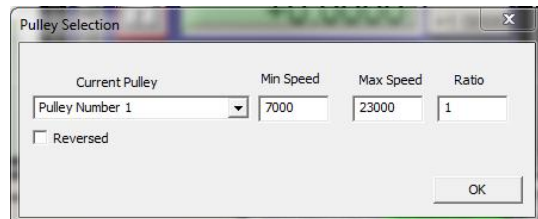
6.3 Step 3. Connecting VFD

This RJ45 handle signals coming from the C41R1.1 board.

LIMIT SWITCHES CONNECTOR	
RJ45 PIN	DESCRIPTION
1	ANALOG OUTPUT COMMON (AI)
2	ANALOG OUTPUT (ACM)
3	NOT USED
4	RELAY 1 NO (Normally Open) CONTACT (CW) or (ON/OFF)
5	NOT USED
6	RELAY 2 NO (Normally Open) CONTACT (CCW) or (CW/CCW)
7	NOT USED
8	RELAYS COMMON CONTACTS (DCM)

The box is prewired for US VFD Mode, if using on International mode, open the box and move the jumper on the C41.

The true max and min speeds of the spindle must be set:



For additional information, please refer to the documentation for the C41 board:
http://www.cnc4pc.com/Store/osc/product_info.php?products_id=236.

6.4 Step 4. Vacuum/ Coolant.

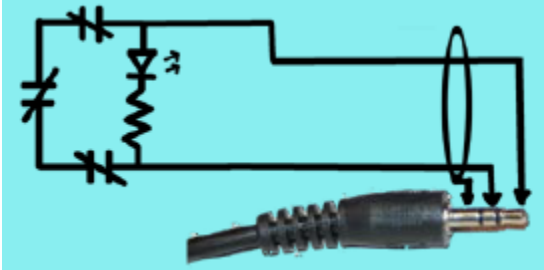
This output is controlled by an electromechanical Relay.



6.5 Step 5. Connecting Probe.

Touch probes are wired and preconfigured and just needs to be connected to the back panel. CNC4PC offers this unit:

http://www.cnc4pc.com/Store/osc/product_info.php?cPath=69&products_id=323, but other may be used as long as the wiring is compatible,



3.5mm Jack

Refer to the product's documentation for additional information:

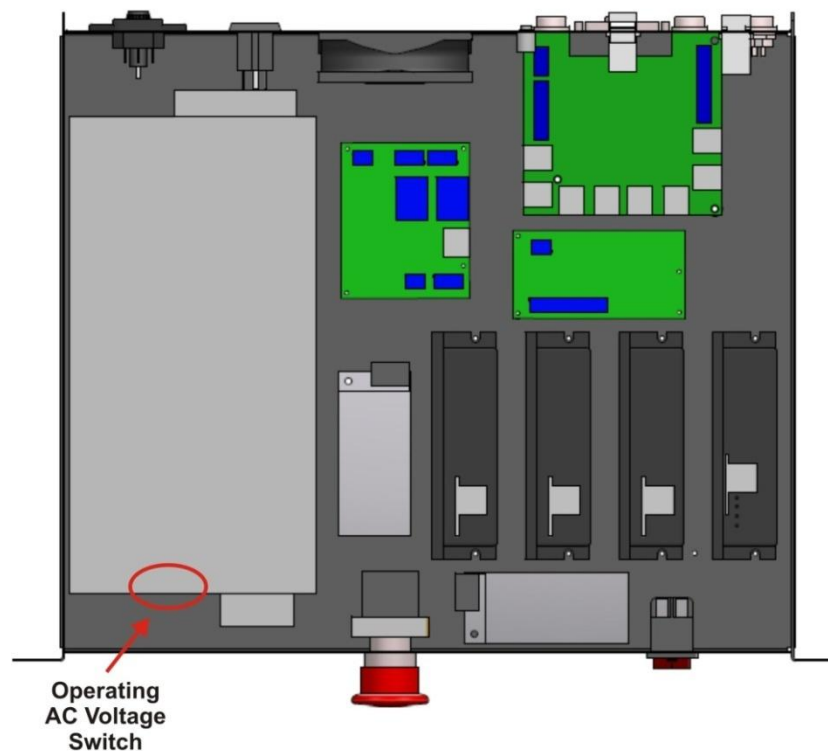
http://cnc4pc.com/Tech_Docs/TP1.pdf

6.6 Step 6. Selecting the AC operating voltage

Select the AC operating voltage by using the switch in the lower side of the box.



It is required that the box is opened to verify this, otherwise the power supply and the electronics can get damaged.



6.7 Step 7. Software Installation:

Before connecting the box to power install the basic software and configuration files:

1. Download and install Mach3 :
<ftp://machsupport.com/Mach/Mach3Version3.042.040.exe>.
2. Install the Mach3 License.
3. Download and copy XML and configuration files: <http://cnc4pc.com/Files/CS4PA0-2.zip> Make sure to copy each file in the specific directory.

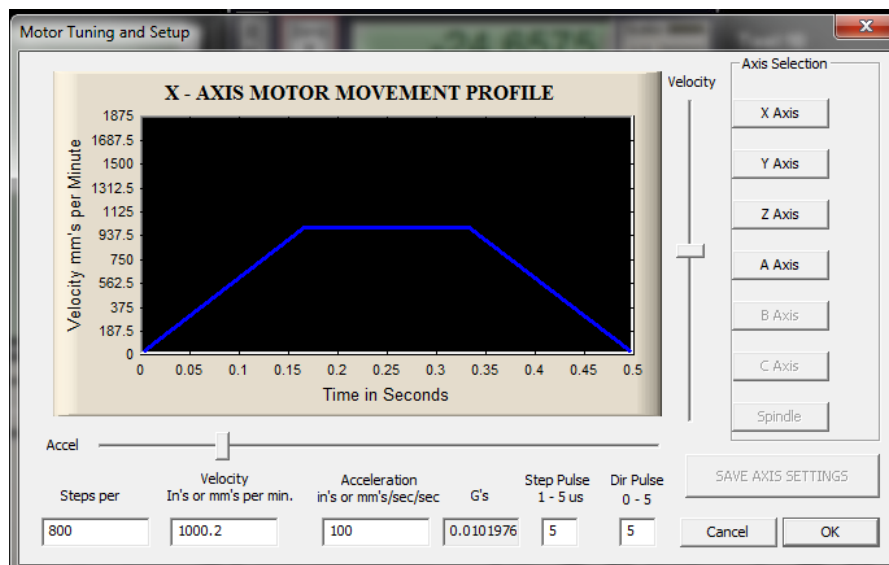
6.8 Step 8. Configuring the Stepper Motor Drivers.

The Stepper Motor Driver used are KL-5056D or KL- 4030:
Check the drivers included the Box and refer to the drivers documentation for configuring them:

<http://kelinginc.net/KL-5056D.pdf>

<http://kelinginc.net/KL-4030.pdf>

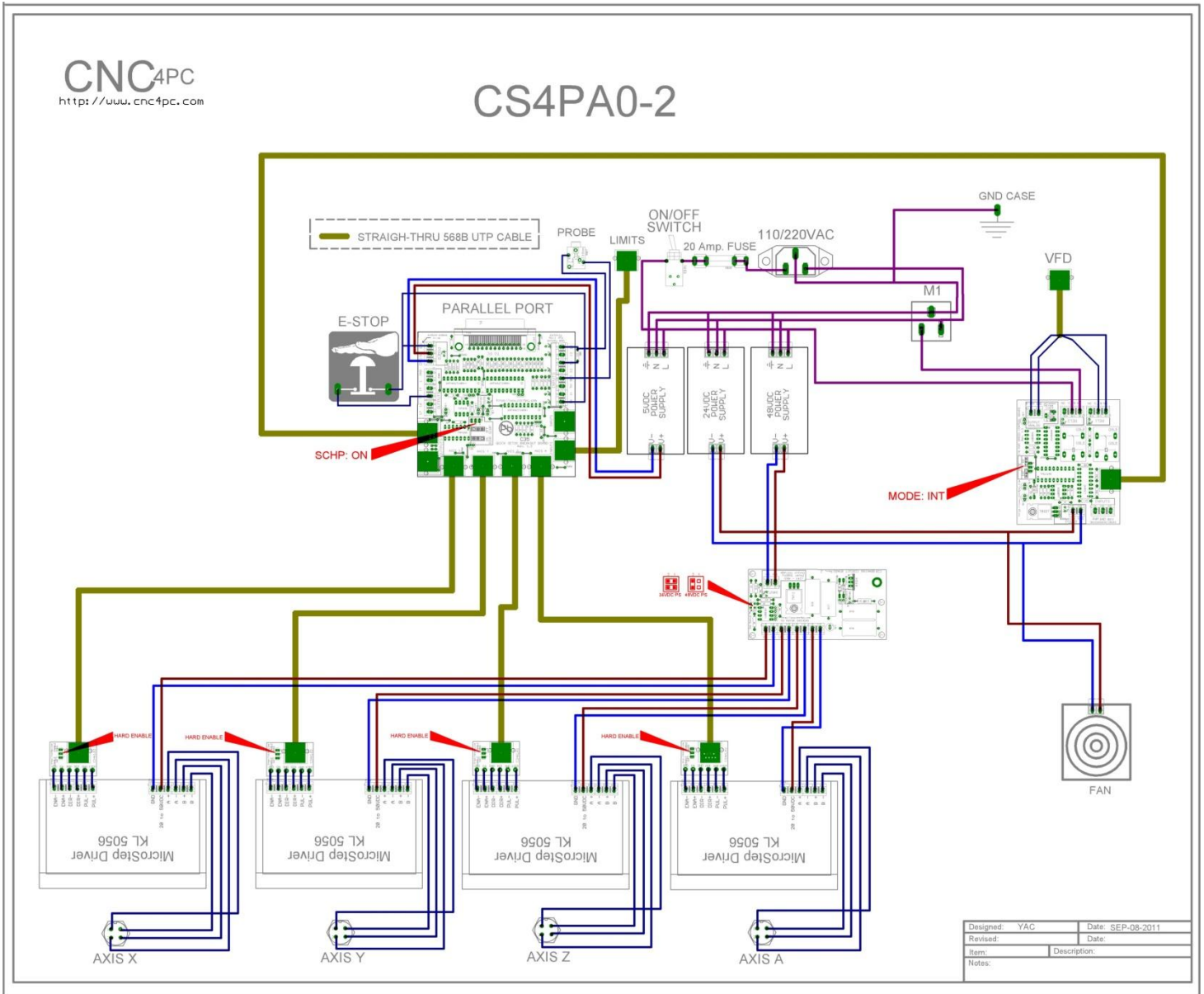
Go to the Motor Tuning window and mach3 and configure the motors to the performance of your table:



7.0 WIRING DIAGRAMS

CNC4PC
http://www.cnc4pc.com

CS4PA0-2



8.0 PART LIST

QUANTIT Y	COMPONENT
1	5VDC@3A Regulated Switching Power Supply
1	24VDC@1.3A Regulated Switching Power Supply
1	Latch Twist-Release E-Stop Button
1	C35 – QUICK SETUP BREAKOUT BOARD
1	C41 - PWM Variable Speed Control Board
1	C38-Braking Circuit Board
4	KL-5056D Driver or KL- 4030 Microstepping Driver
1	KL-600-48 48V/12.5A Power Supply or KL-350-36 36V/9.7A Power Supply
1	A1-Parallel cable
1	A39 - 6 FT Power Cord- Standard System
1	A26 - 1 FT Booted Cat5e Network Patch Cable - Orange
	A27 - 3 FT Booted Cat5e Network Patch Cable - Orange
	5VDC@3A Regulated Switching Power Supply

9.0 DISCLAIMER:

Use caution. CNC machines could be dangerous machines. DUNCAN USA, LLC or Arturo Duncan are not liable for any accidents resulting from the improper use of these devices. This product is not fail-safe device, and it should not be used in life support systems or in other devices where its failure or possible erratic operation could cause property damage, bodily injury or loss of life.