USER'S MANUAL VER.2

C94- MULTIFUNCTION CNC BOARD
Rev. 1

AUGUST 2021

USER'S MANUAL TABLE OF CONTENTS

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1.0 FEATURES

- **Ships with the UC300ETH Motion Controller installed.**
- **Emulates 5 Parallel Ports.**
- **3 Expansion Ports for connecting additional breakout or relay boards.**
- **Two Analog Inputs and Two Outputs.**
- **Built-in PWM-Based Speed Control and Two Built-in Electromechanical Relays with NO and NC positions for spindle control.**
- **The system monitors:**
  - **E-Stop**
  - **Safety Charge Pump.**
- **Electromechanical Relay with NO and NC positions for general purpose or tied to the Enable Signal (Port_2 16 or 17, jumper-selectable).**
- **Microcontroller based Safety Charge Pump (SCHP).**
- **Optoisolated inputs working at 5-24VDC.**
- **Uses a single +10 to +30VDC to power the system. It generates the isolated voltage for the spindle control circuit and +5vdc for circuits using TTL logic.**
- **Status LEDs on all Input and Output connections.**
- **DIN Rail mountable.**
- **Open Collector Outputs pins 1, 14, 16, 17 on port 2.**
- **Screw-On connections for all terminals.**
- **Status LEDs for enable.**
- **Available installers and configuration files that configure all the functions of the board.**

2.0 I/O SPECIFICATIONS

Inputs and Outputs are jumper selected to be TTL or Open collector.

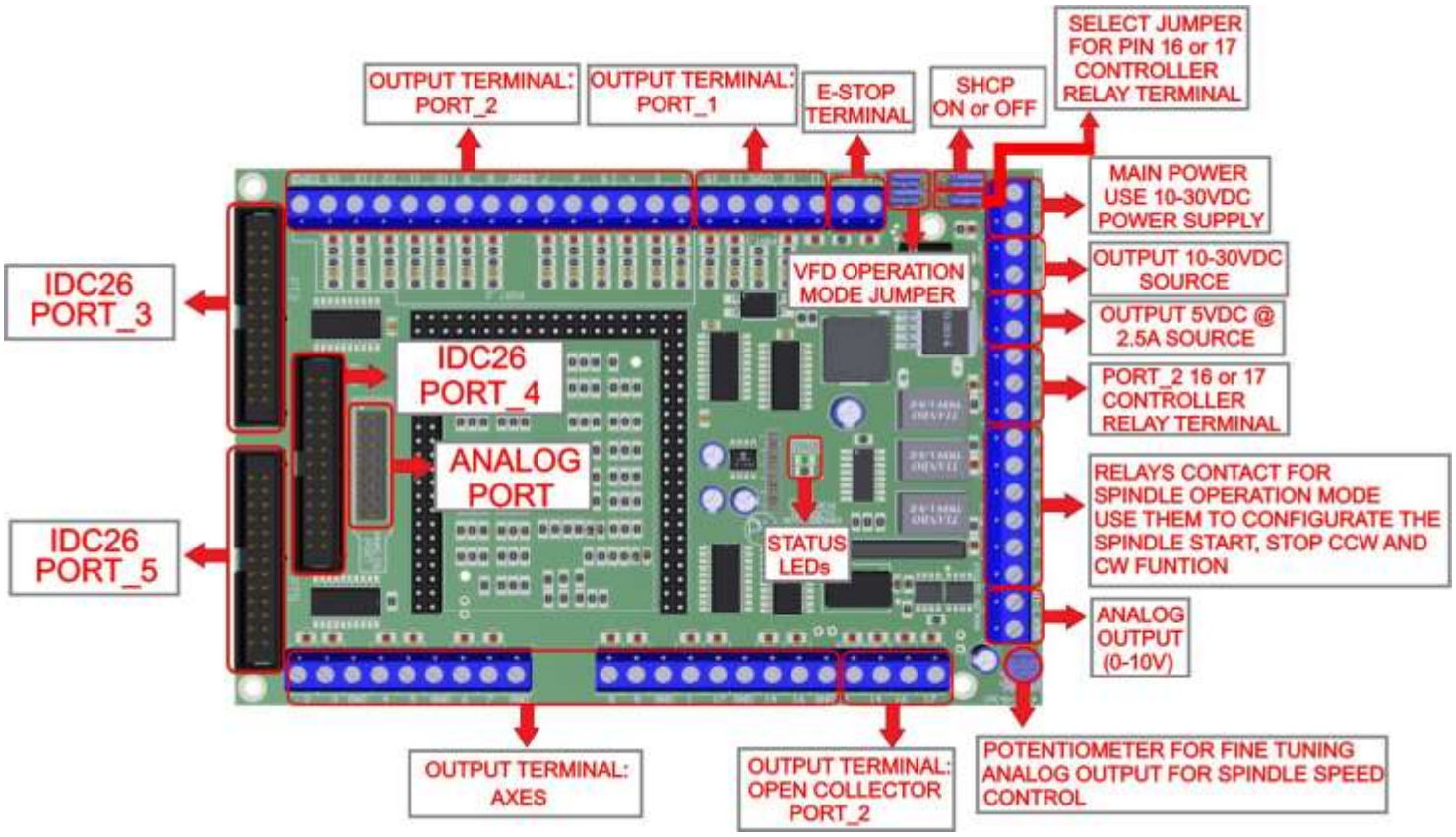
PINS	PORT1	PORT2	PORT3	PORT4	PORT5	TOTAL
INPUT	5	13	13	5	13	49
OUTPUT	12	4	4	12	4	36
TOTAL	17	17	17	17	17	93

OPTOISOLATED DIGITAL INPUT TTL SPECIFICATIONS	
On-state voltage range	5 to 24VDC
Maximum off-state voltage	0.8V
Typical signal delay	2.8uS

DIGITAL OUTPUT TTL SPECIFICATIONS	
Maximum output voltage	5VDC
Maximum output current	50mA
Maximum off-state voltage	0.44 V
Maximum supported frequency	400KHz
Typical signal delay	10nS
Time of transition to high impedance state	12 s*

OPEN COLLECTOR OUTPUT SPECIFICATIONS	
Maximum output voltage	60VDC
Maximum output current	2A
Typical signal delay	0.5 µS

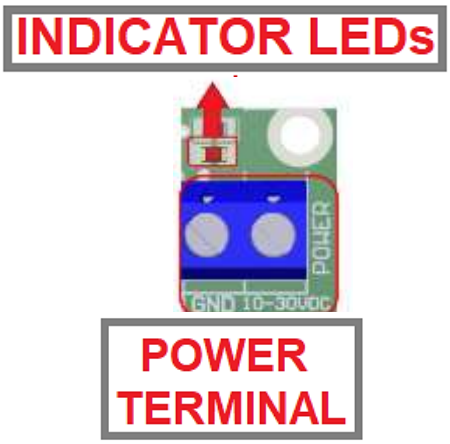
3.0 BOARD DESCRIPTION



4.0 POWER TERMINALS AND CONFIGURATION

4.1 Power terminal

Regulated +10VDC or +30VDC at 2 Amps is required to power this board. Additional amperage must be supplied if sourcing current on the open collector outputs or using the Expansion IDC26 ports to power breakout or relay boards.

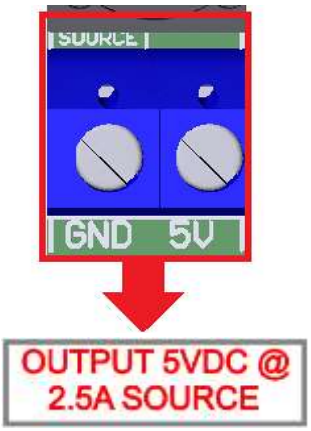


WARNING

Check the polarity and voltage of the external power source and connect the 10VDC to 30VDC and GND. Overvoltage or reverse-polarity power applied to these terminals can cause damage to the board, and/or the power source

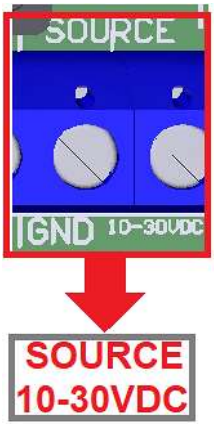
4.2 Source Output 5VDC

The board can supply regulated voltage to power external devices or circuits.

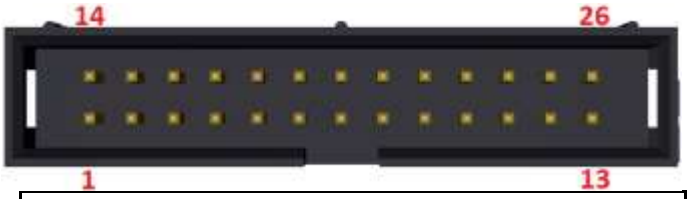


4.3 Source Output 10-30VDC

10-30VDC can be sourced to sensors or other cards requiring it.



5.0 LPT_3 AND LPT_5 INPUT EXPANSION PORT



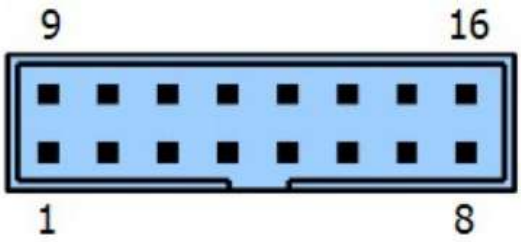
LPT 3 and LPT 5	
Equivalent P.P. Pin	**UC300 Function**
P_1	OUTPUT
P_2	INPUT
P_3	INPUT
P_4	INPUT
P_5	INPUT
P_6	INPUT
P_7	INPUT
P_8	INPUT
P_9	INPUT
P_10	INPUT
P_11	INPUT
P_12	INPUT
P_13	INPUT
P_14	OUTPUT
P_15	INPUT
P_16	OUTPUT
P_17	OUTPUT
P_18	GND

6.0 LPT_4 OUTPUT EXPANSION PORT

LPT 4	
Equivalent P.P. Pin	**UC300 Function**
P4_1	OUTPUT
P4_2	OUTPUT
P4_3	OUTPUT
P4_4	OUTPUT
P4_5	OUTPUT
P4_6	OUTPUT
P4_7	OUTPUT
P4_8	OUTPUT
P4_9	OUTPUT
P4_10	INPUT
P4_11	INPUT
P4_12	INPUT
P4_13	INPUT
P4_14	OUTPUT
P4_15	INPUT
P4_16	OUTPUT
P4_17	OUTPUT
P4_18	GND

7.0 ANALOG I/O PORT PINOUT.

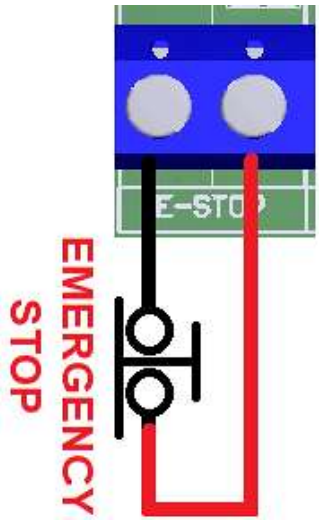
The analog port contains 2 analog inputs and 2 analog outputs. This port also contains a 5Volts power output.



Pin	Signal direction
1	5 Volt output
2	Ground
3	Analog input 1.
4	Analog input 2.
5	Ground
6	Analog output 1.
7	Analog output 2.
8	5 Volt output
9	5 Volt output
10	Ground
11	Analog input 1.
12	Analog input 2.
13	Ground
14	Analog output 1.
15	Analog output 2.
16	5 Volt output

8.0 E-STOP TERMINAL (24V)

Connect an E-STOP push button as is shown in the below images.



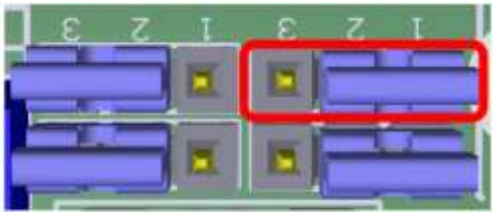
Pin 10 port 1 is used for E-Stop. Since this board controls the enable line, and the enable line is the one responsible for notifying the controller of the e-stop condition, the user does not have a direct access to the pin itself, just to the e-stop terminal on the board. The E-Stop terminal is tied to the enable line and will trigger the e-stop. A fault or E-Stop triggers a low for 5 seconds to notify the controller of the fault condition, then resets to high again

9.0 CONFIGURATION JUMPERS

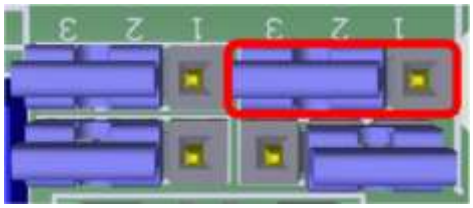
9.1 Selecting the SCHP operation mode

The Safety Charge Pump can be activated or deactivated depending on the jumper position. If the SCHP is enabled, the board will require the SCHP coming from the controller to be present in order to get activated (green LED).

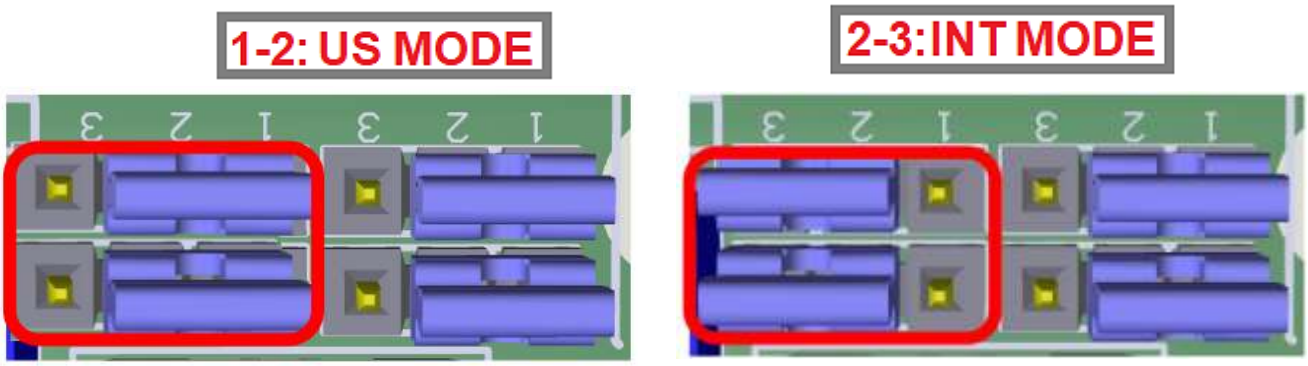
1-2: DISABLE



2-3:ENABLE



9.2 Configuration jumper mode US or INT



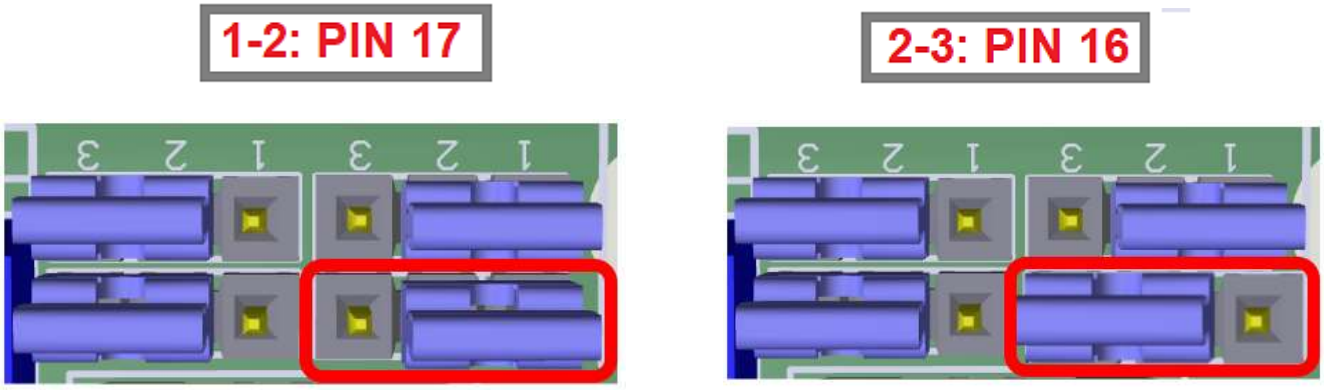
For the Variable speed control go to
http://cnc4pc.com/Tech_Docs/VARIABLE_SPEED_CONTROL.pdf

For Configure the control software go to
http://cnc4pc.com/Tech_Docs/CONFIGURATION_OF_CONTROL_SOFWARE.pdf

For Replacing Potentiometer go to
http://cnc4pc.com/Tech_Docs/Replacing%20a%20Potentiometer.pdf

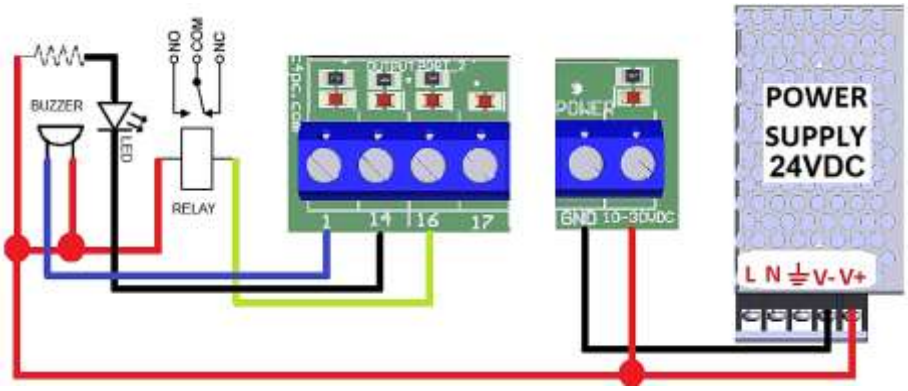
9.3 Relay 3 Operation can be assigned to pins 16 or 17 on port 2.

If assigning the relay to pin 17 on port 2 and using the Safety Charge Pump, then the relay will activate with the board activates. This can be very useful as it can be used to activate the main contactor for the system or relays that activate devices.

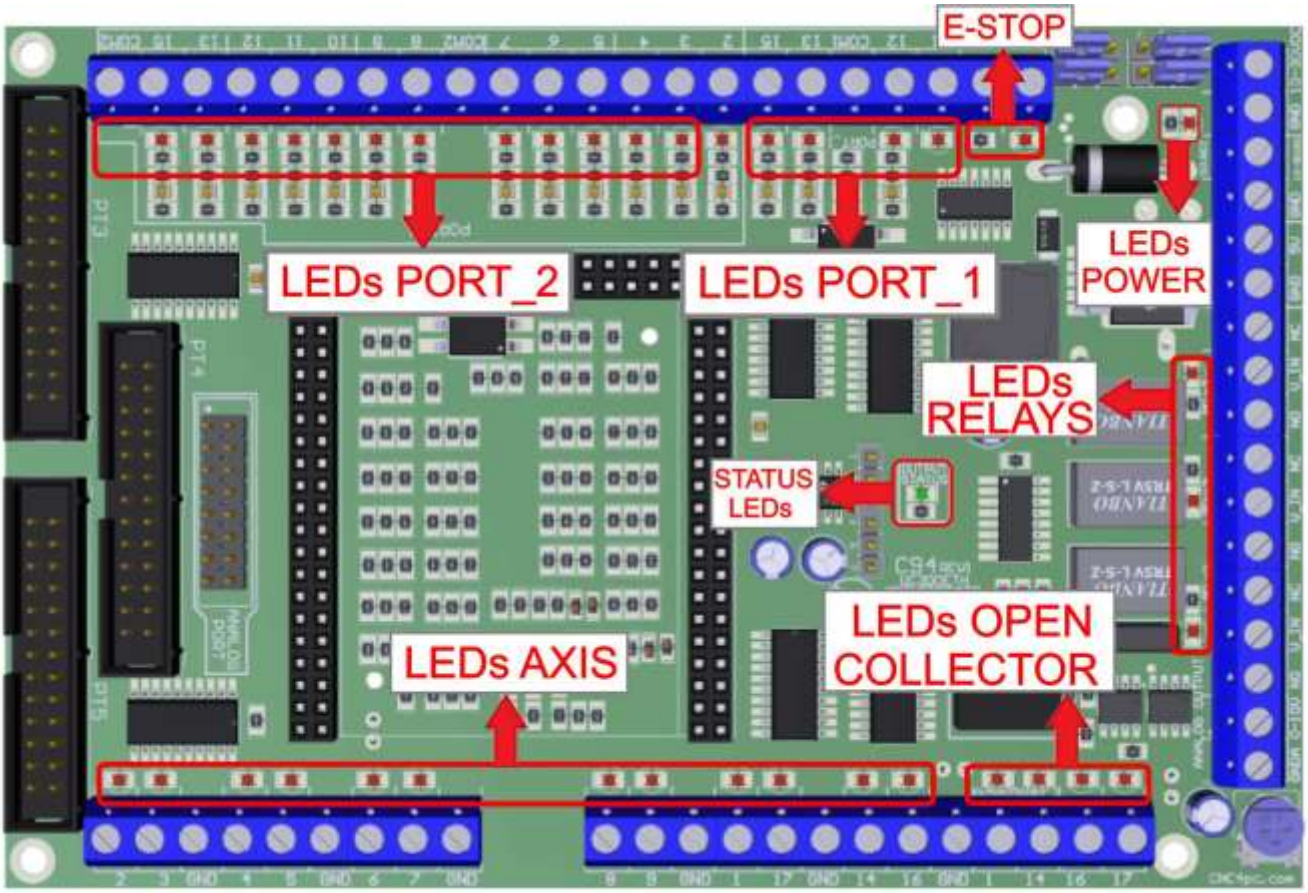


10.0 GENERAL PURPOSE OUTPUT TERMINALS

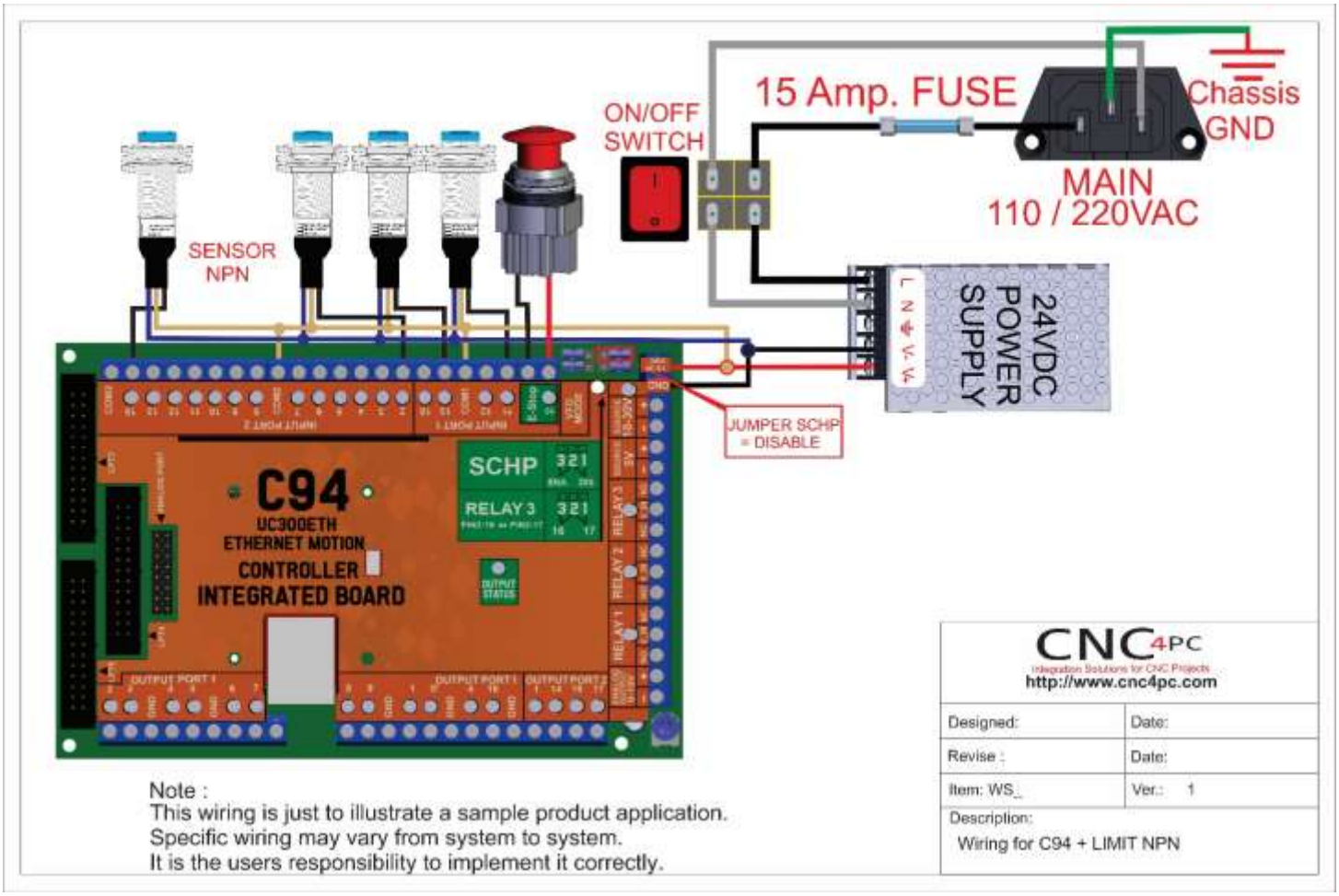
Open Collector Outputs Sample Wiring



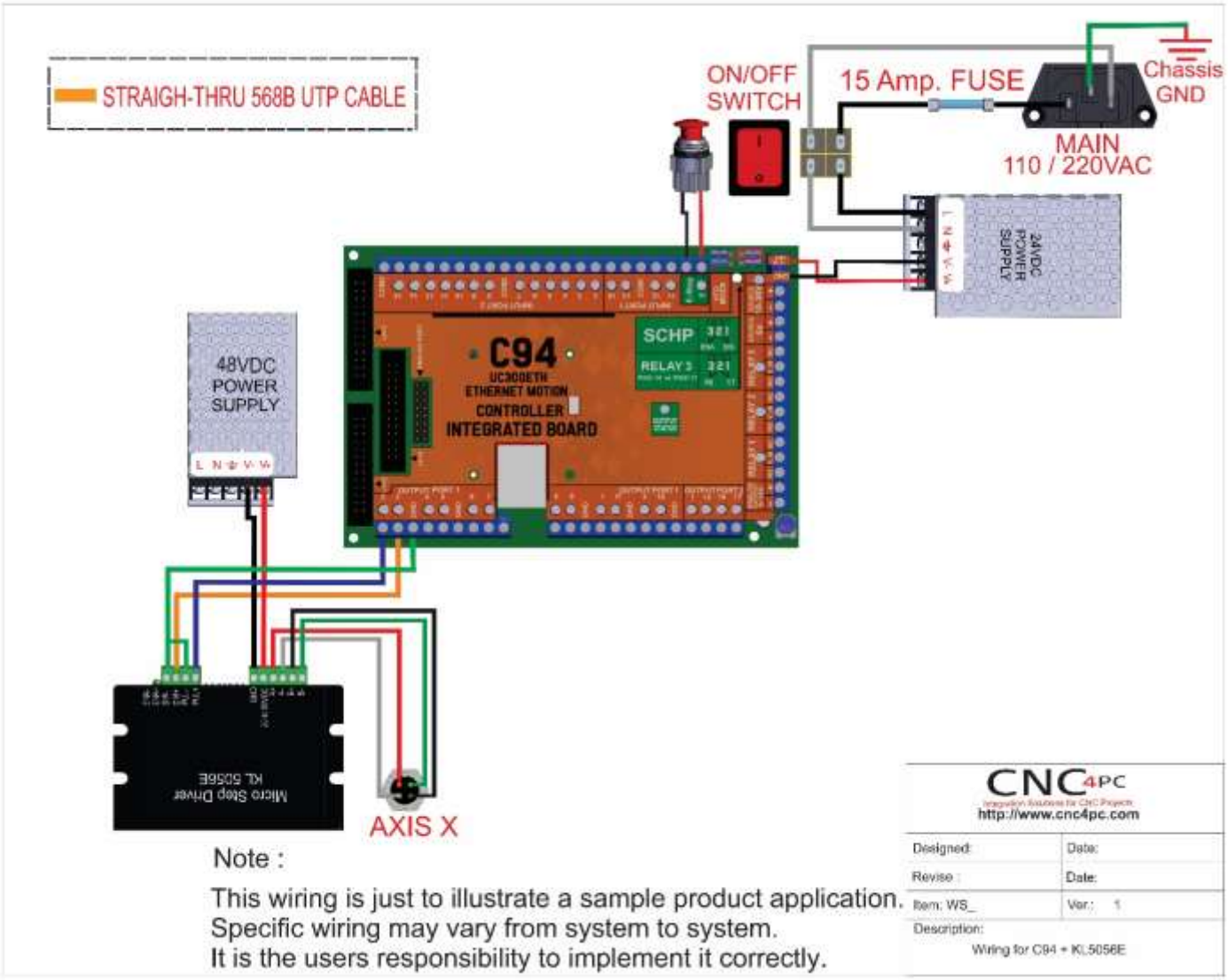
11.0 LEDs



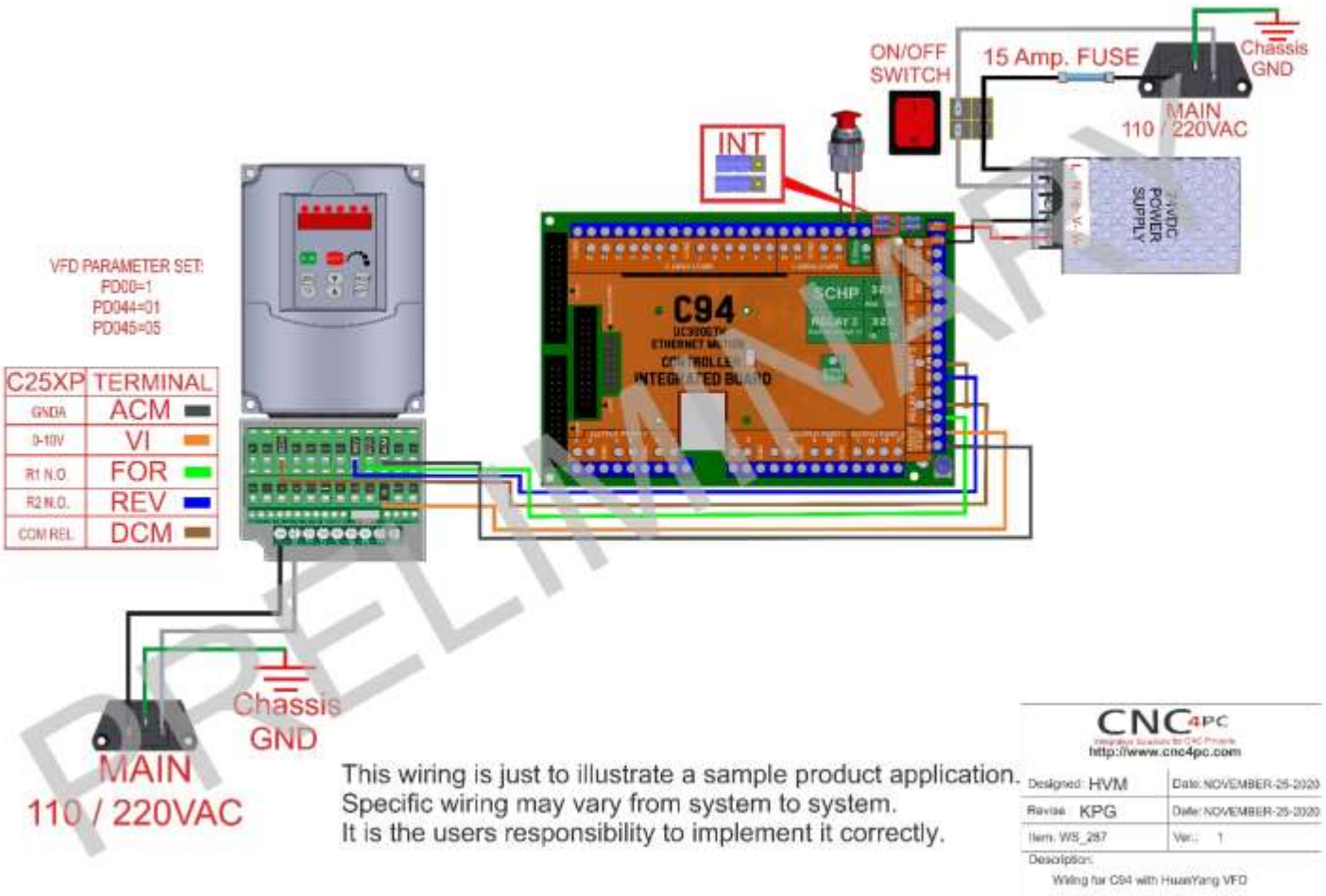
12.0 WIRING SAMPLE FOR INPUT PORT_1 AND PORT_2



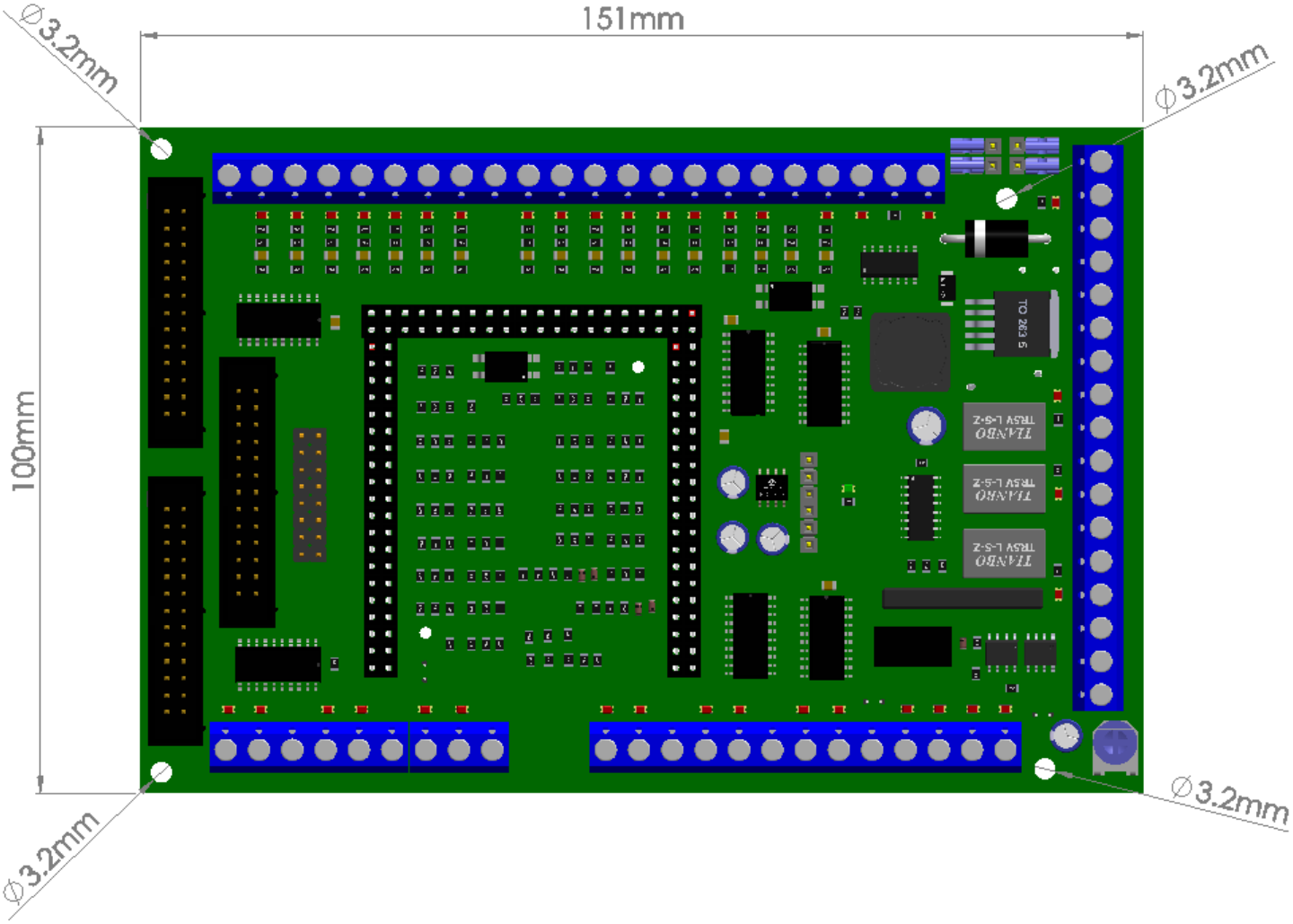
13.0 AXES WIRING SAMPLE



14.0 WIRING SAMPLE VFD



15.0 DIMENSIONS



All dimensions are in Millimeters

Disclaimer:

Use caution. CNC machines can be dangerous machines. Neither DUNCAN USA, LLC nor Arturo Duncan are liable for any accidents resulting from the improper use of these devices. This product is not a 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.