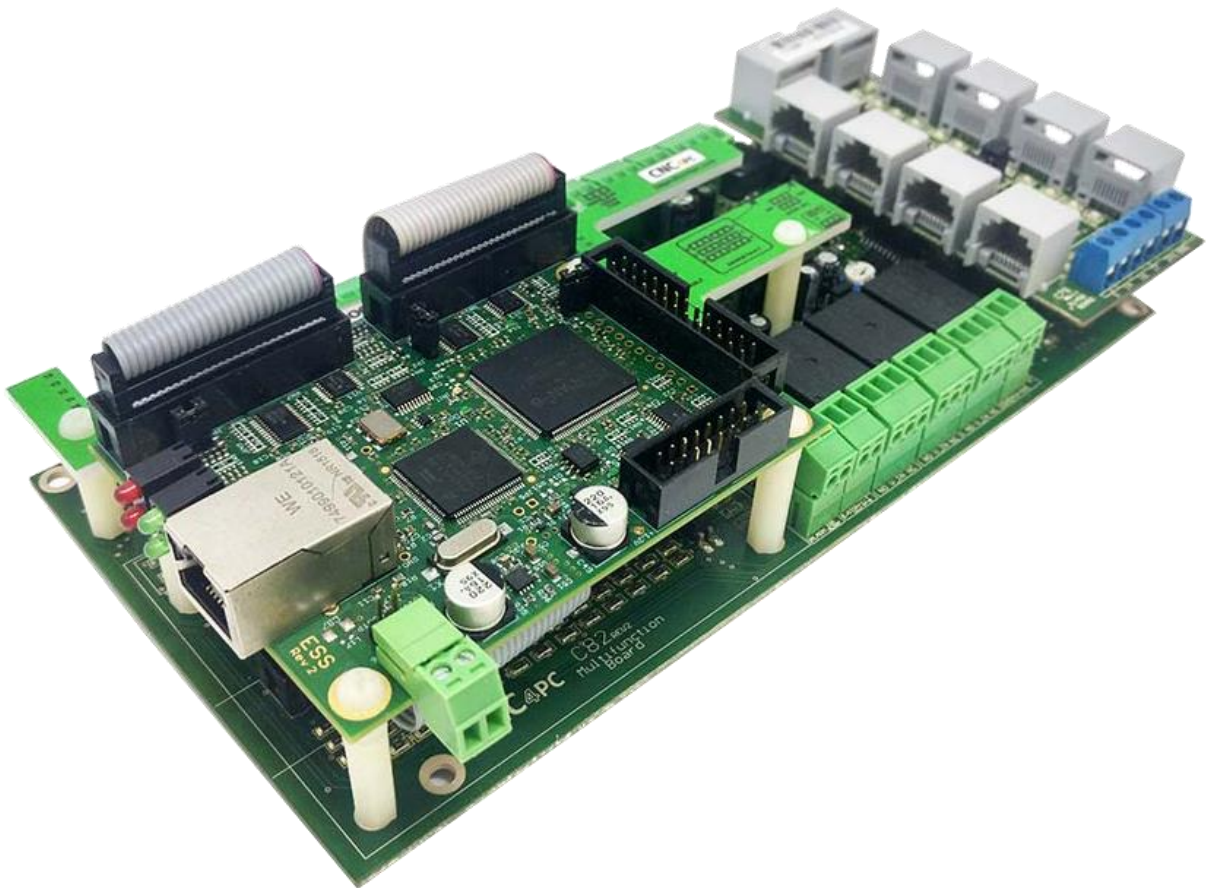


**C82- MULTIFUNCTION CNC BOARD
Rev. 2**



AUG 2018

USER'S MANUAL TABLE OF CONTENTS

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1.0 FEATURES

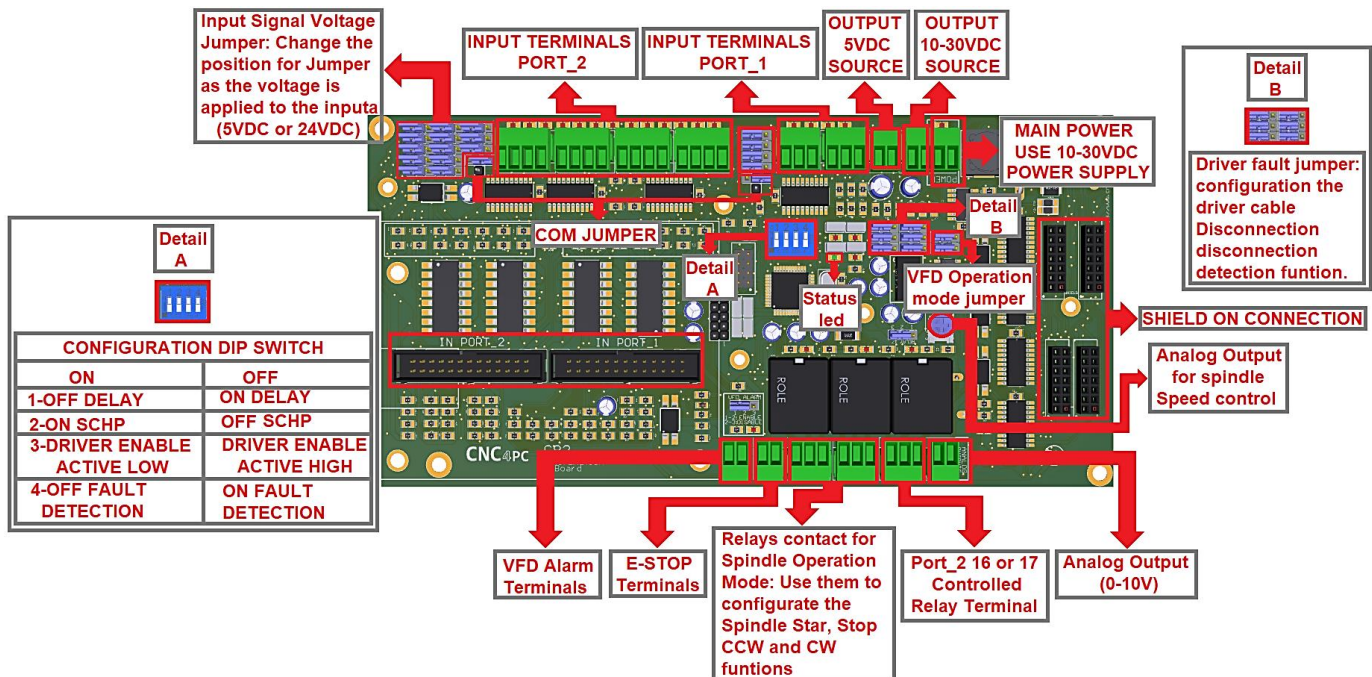
- **Designed for ESS AND ETHER-MACH motion controller.**
- **Built-in PWM-Based Speed Control and Two Built-in Electromechanical Relays with NO and NC positions for spindle control.**
- **The system monitors:**
 - **E-Stop**
 - **Safety Charge Pump.**
 - **VFD Fault.**
 - **Driver Fault.**
- **Discrete Inputs and Outputs can be using with +5vdc TTL logic or 10-30vdc Logic.**
- **Electromechanical Relay with NO and NC positions for general purpose (Port_2 16 or 17, jumper-selectable).**
- **Microcontroller based SCHP.**
- **Optoisolated inputs.**
- **Can be powered with a voltage between +10 and +30VDC.**
- **Status LEDs on all input and Output connections.**
- **DIN Rail mountable.**
- **Pluggable Screw-On Terminals.**
- **It is compatible with family of C34 connector boards that allow quickly connecting to popular drives connecting not just the step and direction signals, but also the fault and enable signals.**

2.0 I/O SPECIFICATIONS

OPTOISOLATED DIGITAL INPUT TTL SPECIFICATIONS	
On-state voltage range	2 to 5V DC or 5 to 30vdc
Maximum off-state voltage	0.8V
Typical signal delay	2.8uS

DIGITAL OUTPUT TTL SPECIFICATIONS	
Maximum output voltage	(5V power supply voltage) + 0.5V
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*

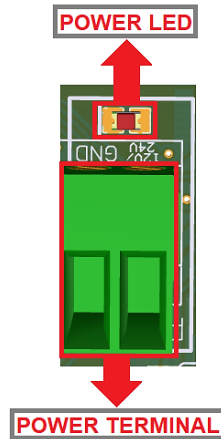
3.0 BOARD DESCRIPTION



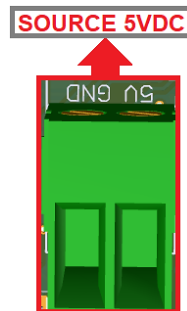
4.0 POWER TERMINALS AND CONFIGURATION JUMPERS

4.1 Power terminal

The board requires an external power supply which can deliver 10-30VDC@700mA to power the logic of the board and the ESS or ETHER-MACH, but keep in mind that each output can deliver up to 500mA and if powering other breakout or relays boards. So, you will need to add all the expected power consumption.

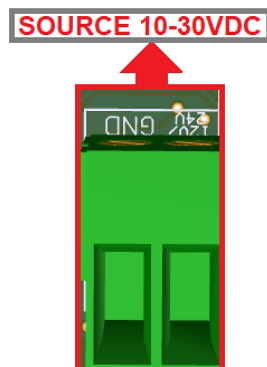


4.2 Source Output 5VDC



4.3 Source Output 10-30VDC

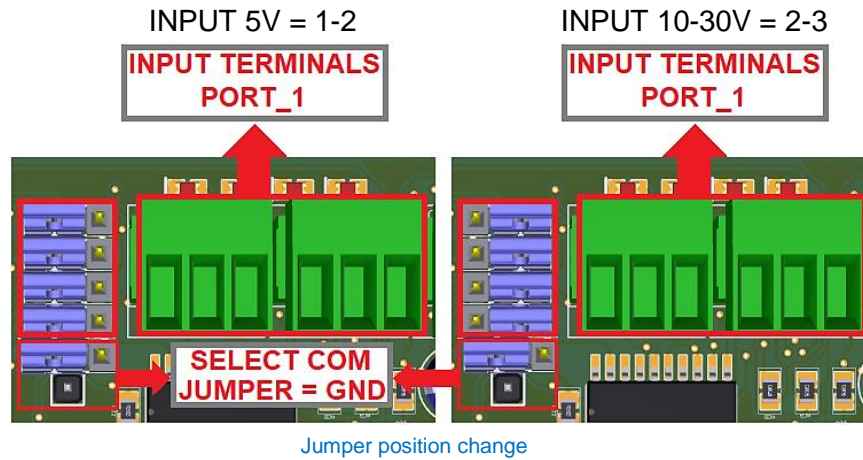
10-30VDC can be sourced to sensors or other cards requiring it.



4.4 Input terminals for port_1 and port_2

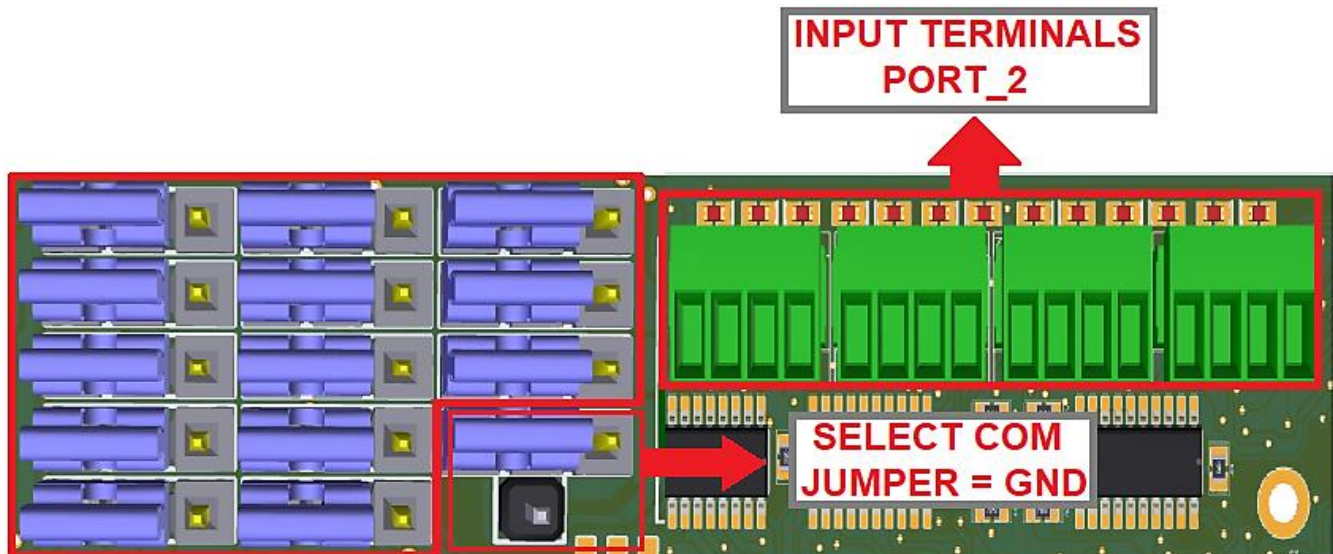
These terminals support signals 5VDC or 10-30VDC, you can connect sensors NPN, PNP, switches, capacitive sensors, etc. set jumpers depending on signal voltage (5VDC or 10-30VDC).

PORT_1

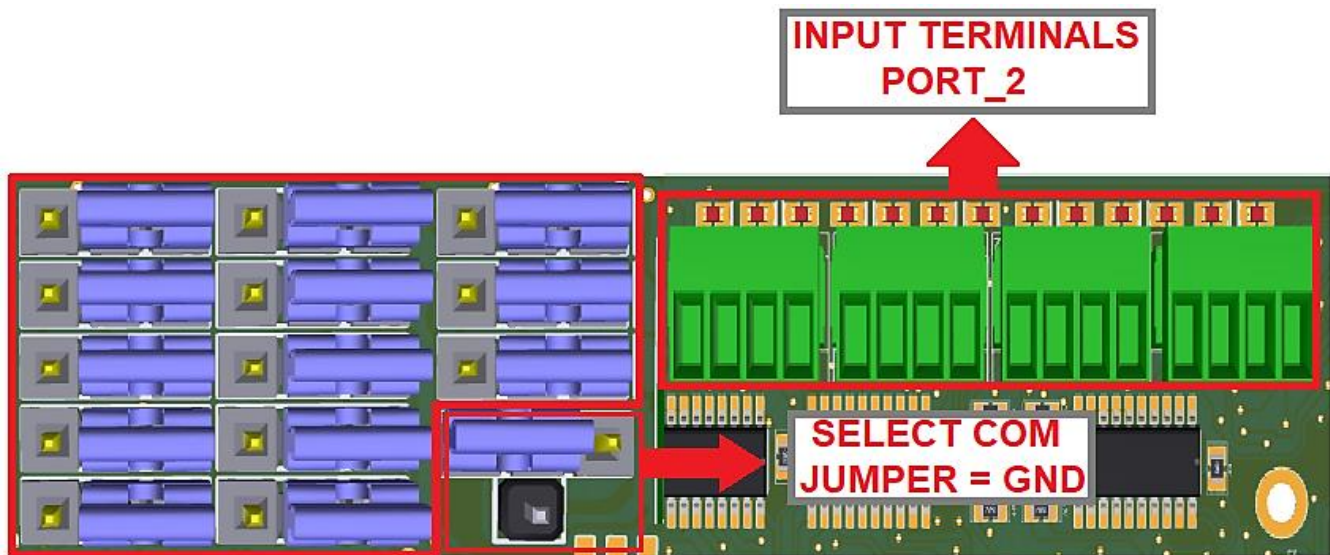


PORT_2

INPUT 5V = 1-2

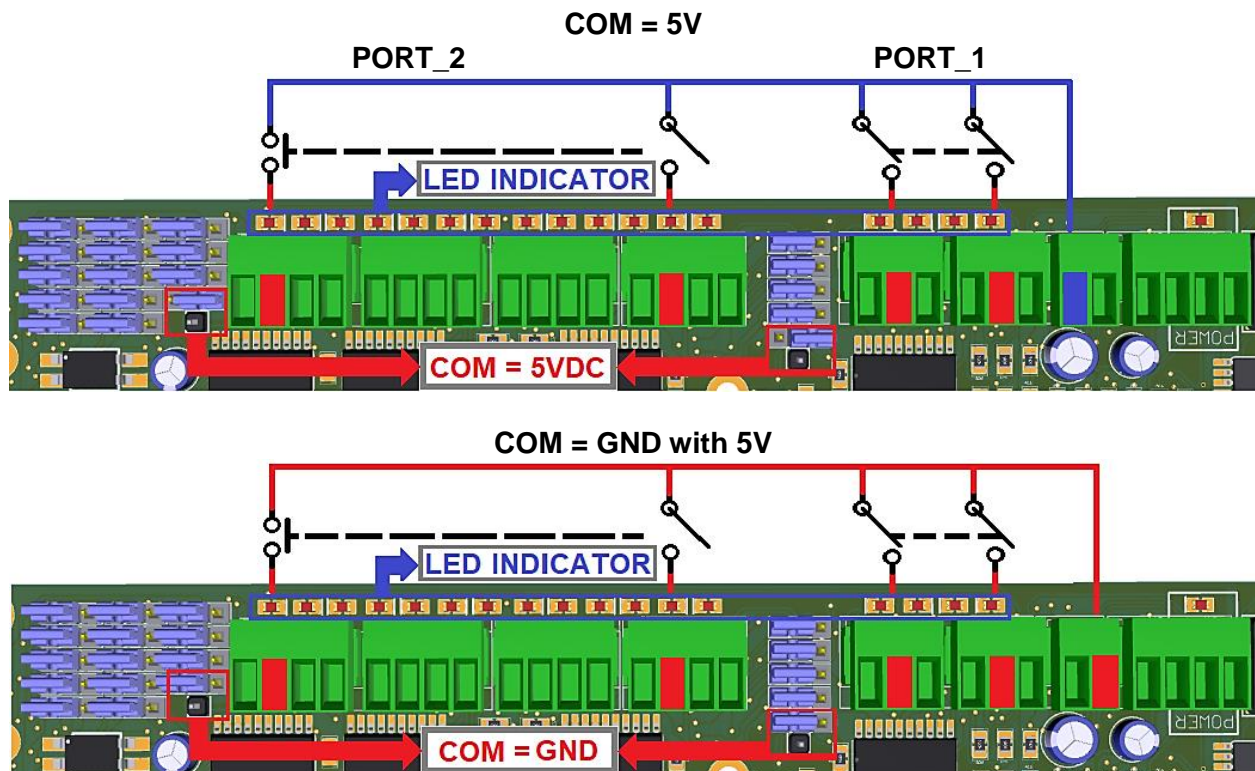


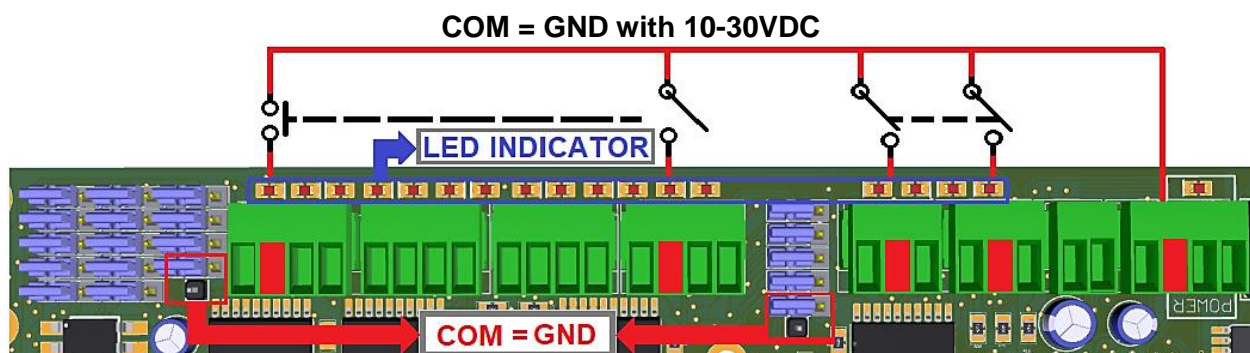
INPUT 10-30V = 2-3



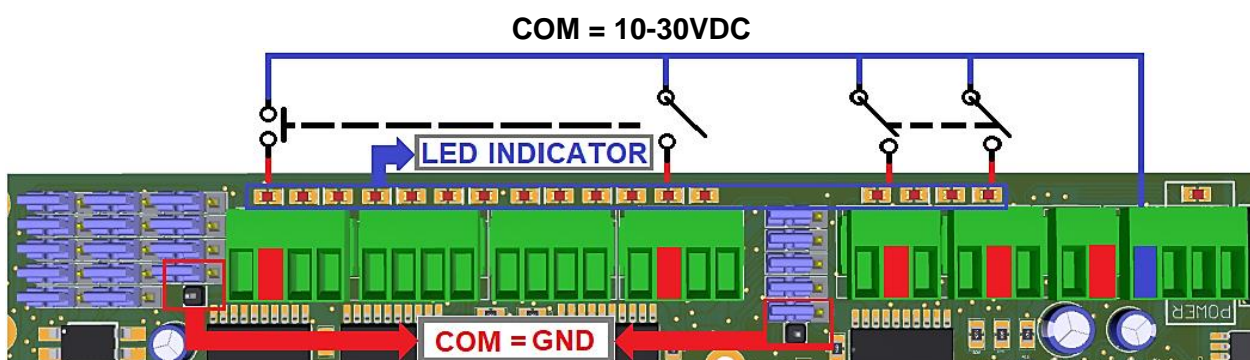
4.5 Select JUMPER COM for the inputs of port_1 and port_2

Set the Jumper to COM = +5VDC, GND or 10-30VDC to determine the common for the input signals to be used.



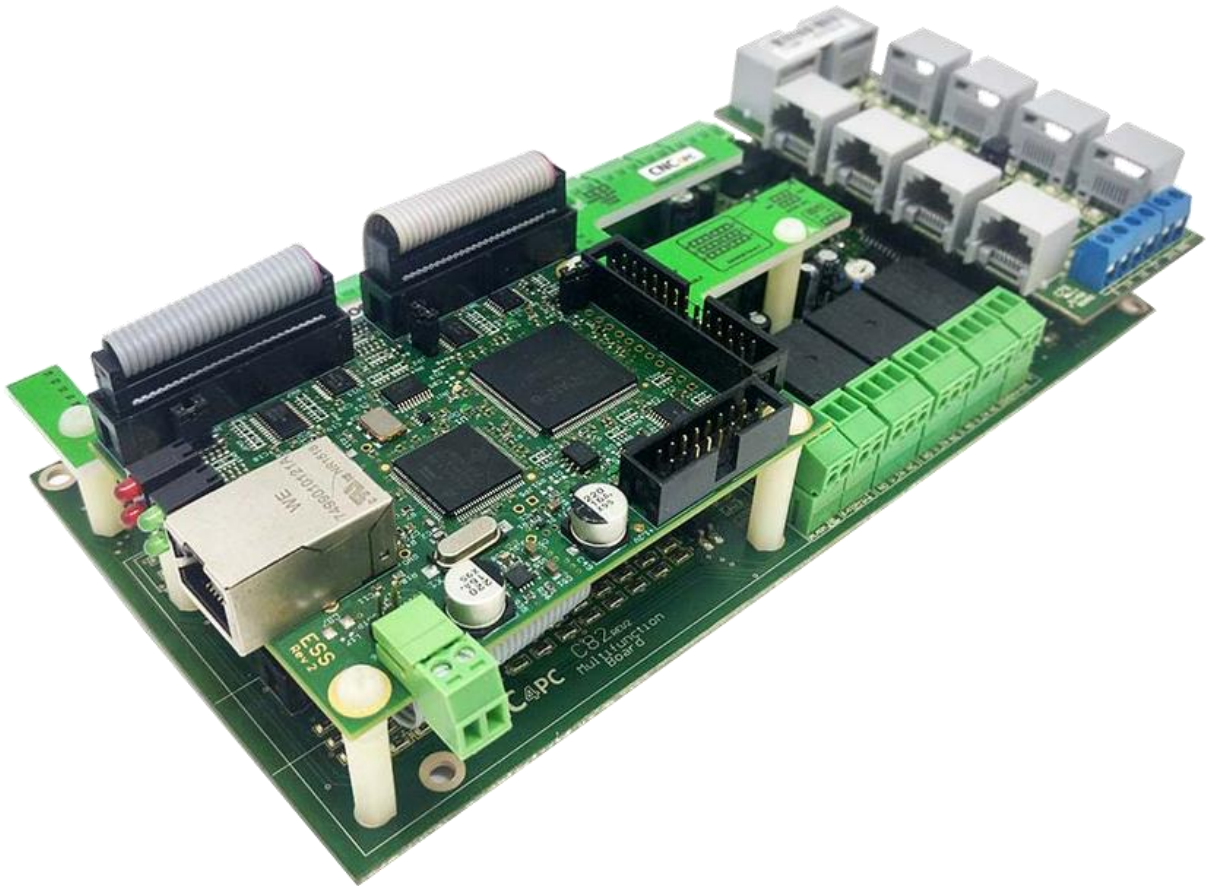


Jumper position changed

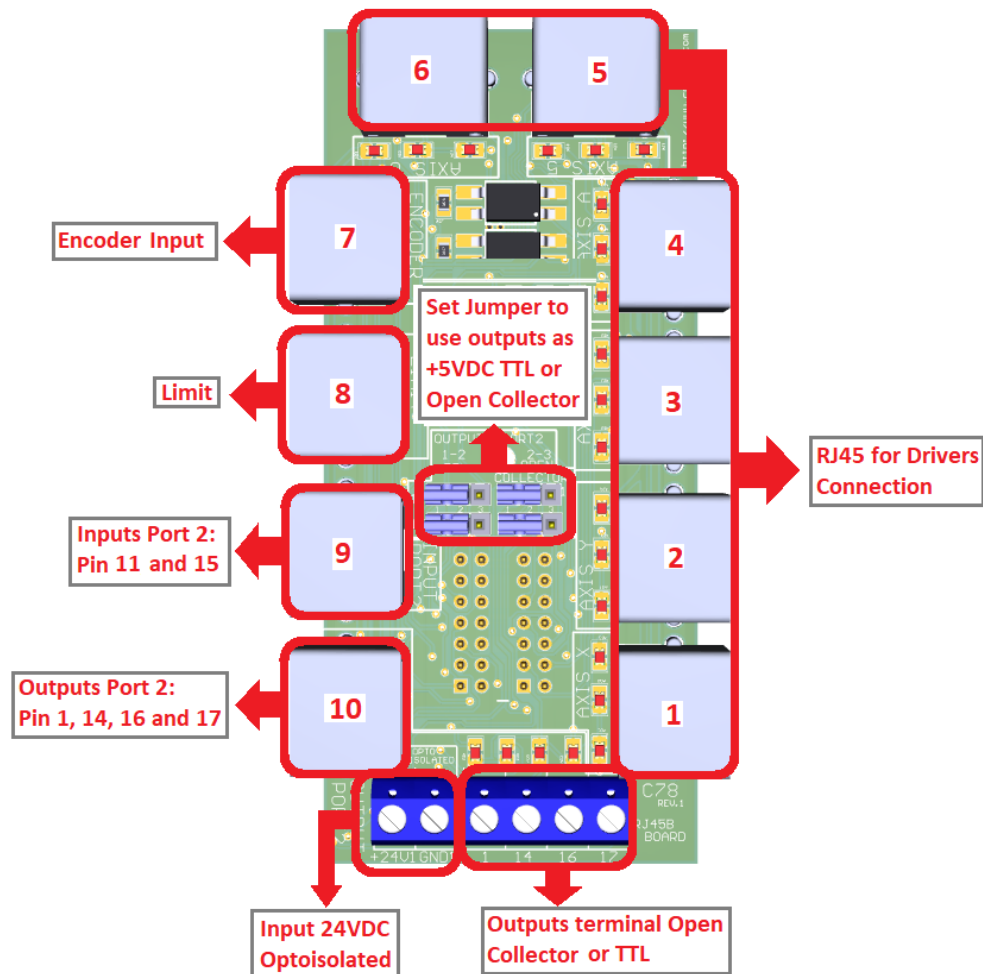


5.0 CONNECTION EXAMPLE FOR SHIELD C78

5.1 RJ45 shield C78 connection for axes, Limits and Encoder



5.2 RJ45 shield board description



5.3 Pinout



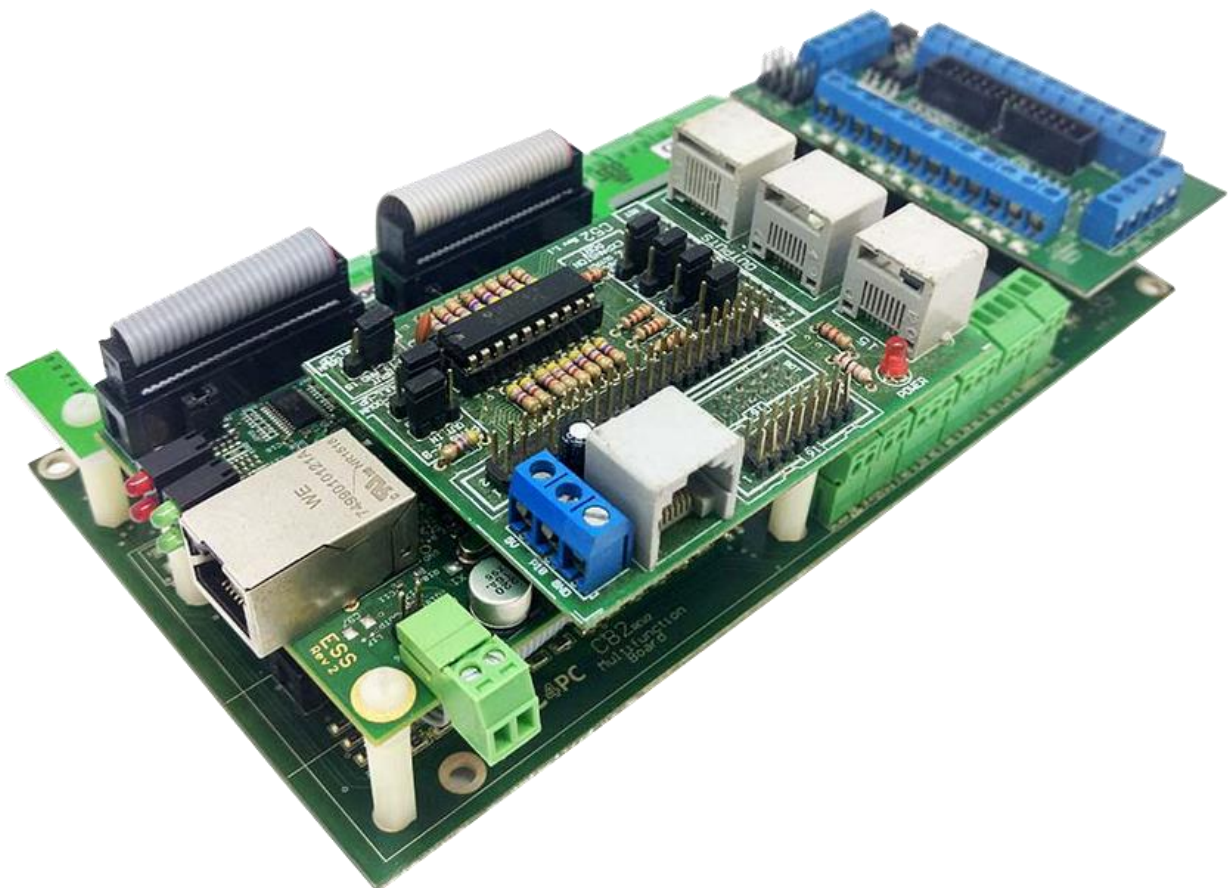
RJ45 Distribution

RJ45_1		RJ45_2		RJ45_3		RJ45_4		RJ45_5		RJ45_6	
RJ45 PIN	P.P. PIN	RJ45 PIN	P.P. PIN	RJ45 PIN	P.P. PIN	RJ45 PIN	P.P. PIN	RJ45 PIN	P.P. PIN	RJ45 PIN	P.P. PIN
1	NC	1	NC	1	NC	1	NC	1	NC	1	NC
2	1_2(Step X)	2	1_4(Step Y)	2	1_6(Step Z)	2	1_8(Step A)	2	1_1(Step 5)	2	1_14(Step 6)
3	NC	3	NC	3	NC	3	NC	3	NC	3	NC
4	GND	4	GND	4	GND	4	GND	4	GND	4	GND
5	Error/res X	5	Error/res Y	5	Error/res Z	5	Error/res A	5	Error/res 5	5	Error/res 6
6	1_3(Dir X)	6	1_5(Dir Y)	6	1_7(Dir Z)	6	1_9(Dir A)	6	1_17(Dir 5)	6	1_16(Dir 6)
7	12/24VDC	7	12/24VDC	7	12/24VDC	7	12/24VDC	7	12/24VDC	7	12/24VDC
8	5VDC	8	5VDC	8	5VDC	8	5VDC	8	5VDC	8	5VDC

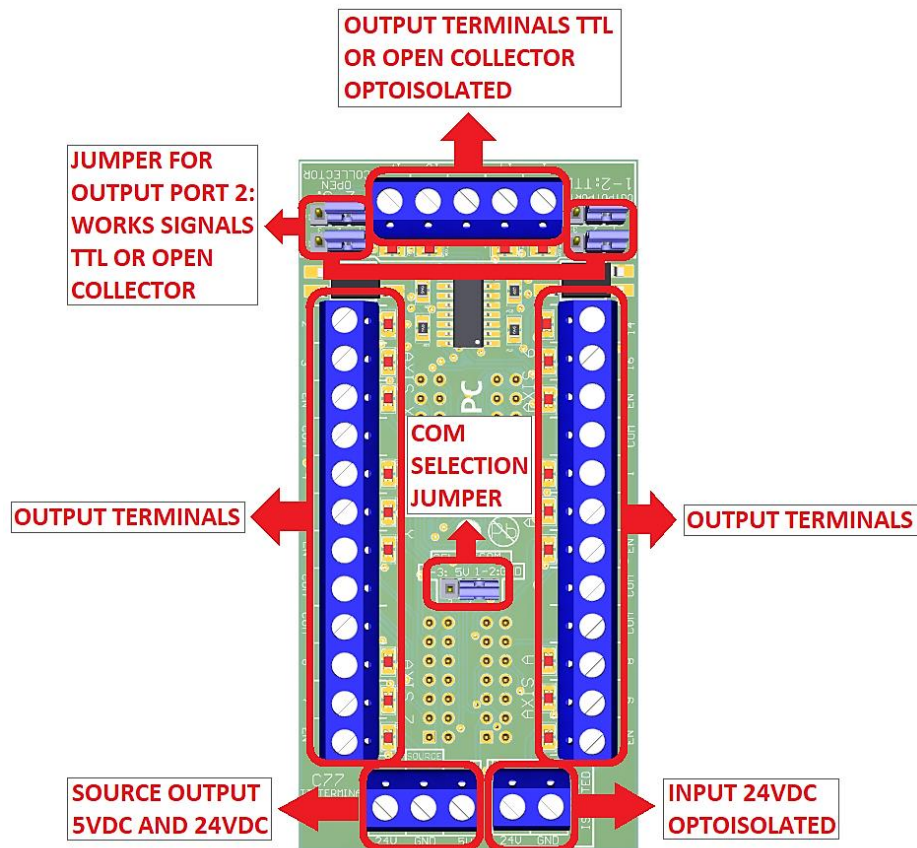
RJ45_7		RJ45_8		RJ45_9		RJ45_10	
RJ45 PIN	P.P. PIN	RJ45 PIN	P.P. PIN	RJ45 PIN	P.P. PIN	RJ45 PIN	P.P. PIN
1	GND	1	GND	1	GND	1	GND
2	5VDC	2	1_13	2	NC	2	2_17
3	NC	3	1_12	3	NC	3	2_16
4	2_4(INDEX)	4	1_11	4	2_11	4	2_1
5	NC	5	1_15	5	1_15	5	2_14
6	2_2(enc. A)	6	2_11	6	NC	6	NC
7	NC	7	12/24VDC	7	12/24VDC	7	5VDC
8	2_3(enc. B)	8	NC	8	NC	8	12/24VDC

6.0 CONNECTION EXAMPLE FOR SHIELD C77

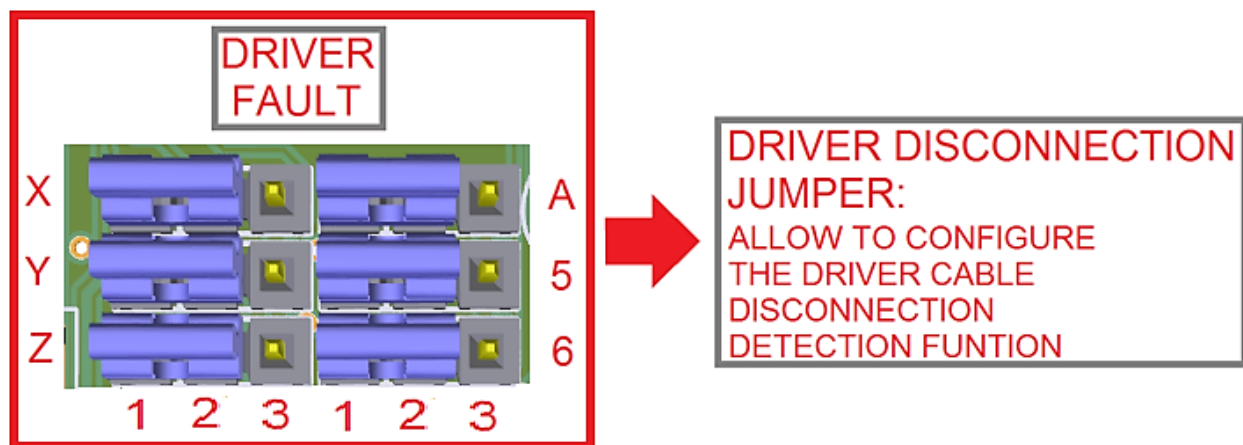
6.1 Terminal Shield Screw-on



6.2 Shield board description



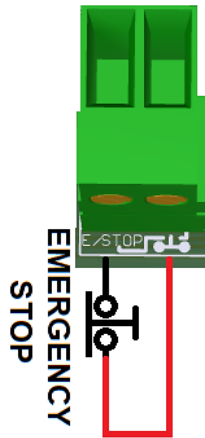
7.0 DRIVER DISCONNECTION JUMPERS



This configures how cable disconnect is to work. Set according to C34 board manual.

1.0 E-STOP TERMINAL

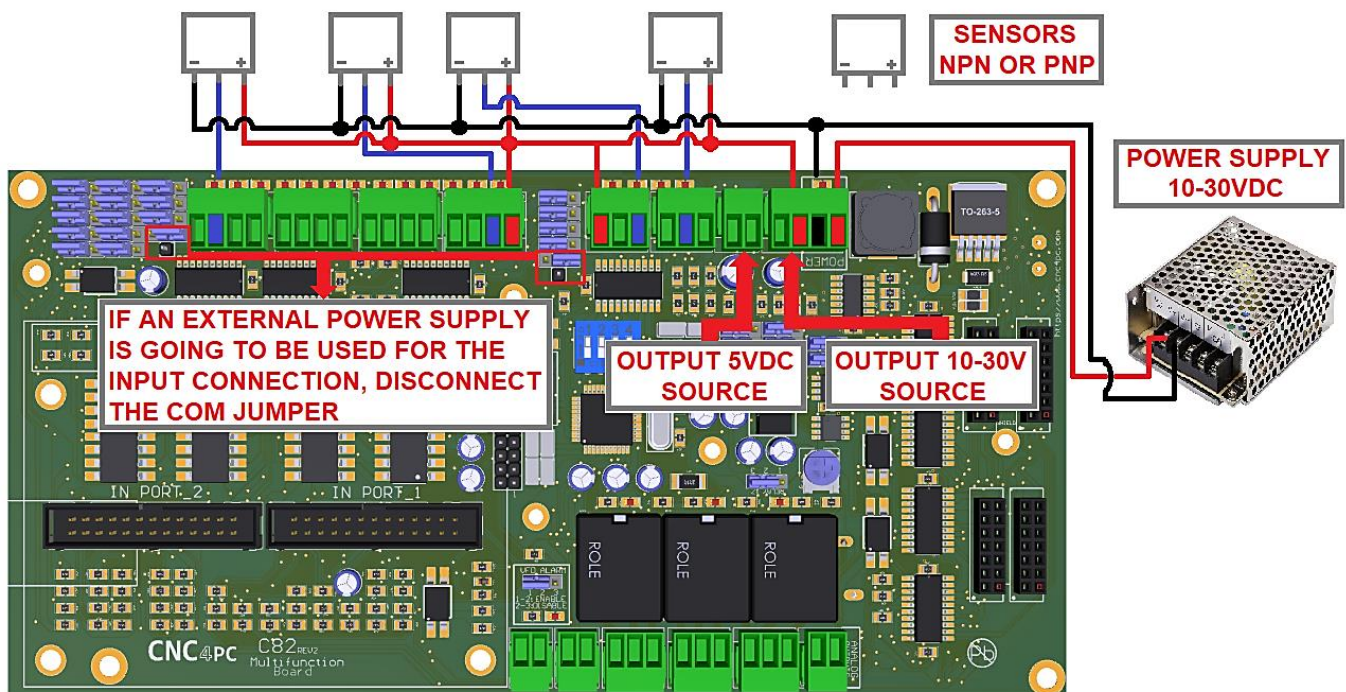
Connect an E-STOP push button as is shown in the below images.



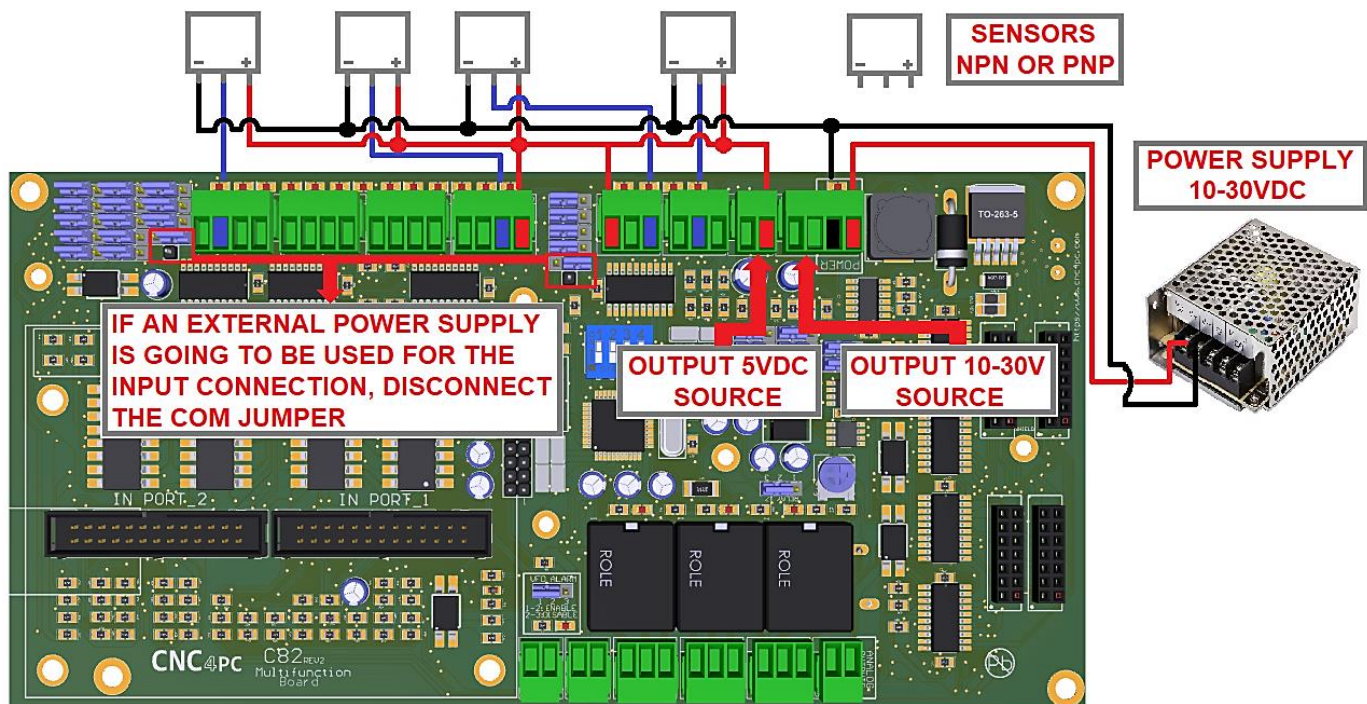
Pin 10 port 1 is used for E-Stop. Since this board controls the enable line, and the enable line is the one responsible for notifying the controller of the e-stop condition, the user does not have a direct access to the pin itself, just to the e-stop terminal on the board. The E-Stop terminal is tied 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.

2.0 TYPICAL CONNECTIONS

-Connection with the terminal of output external of 10 - 30VDC



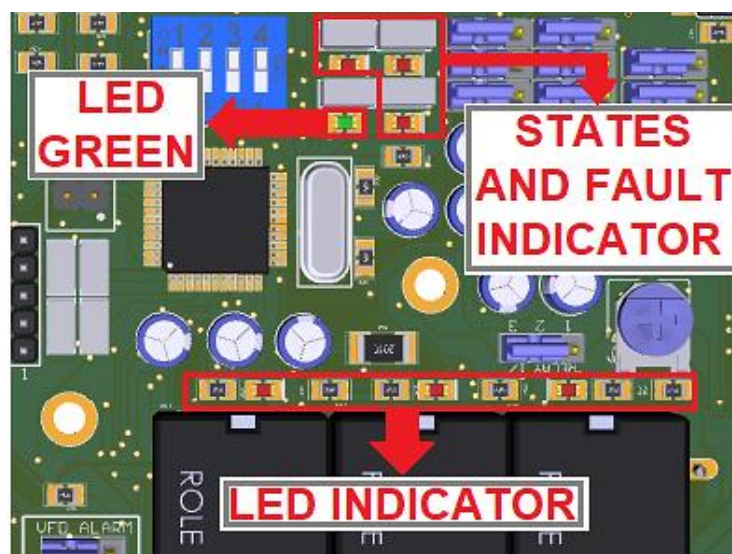
-Connection with the terminal of output external of 5VDC



3.0 LED INDICATOR

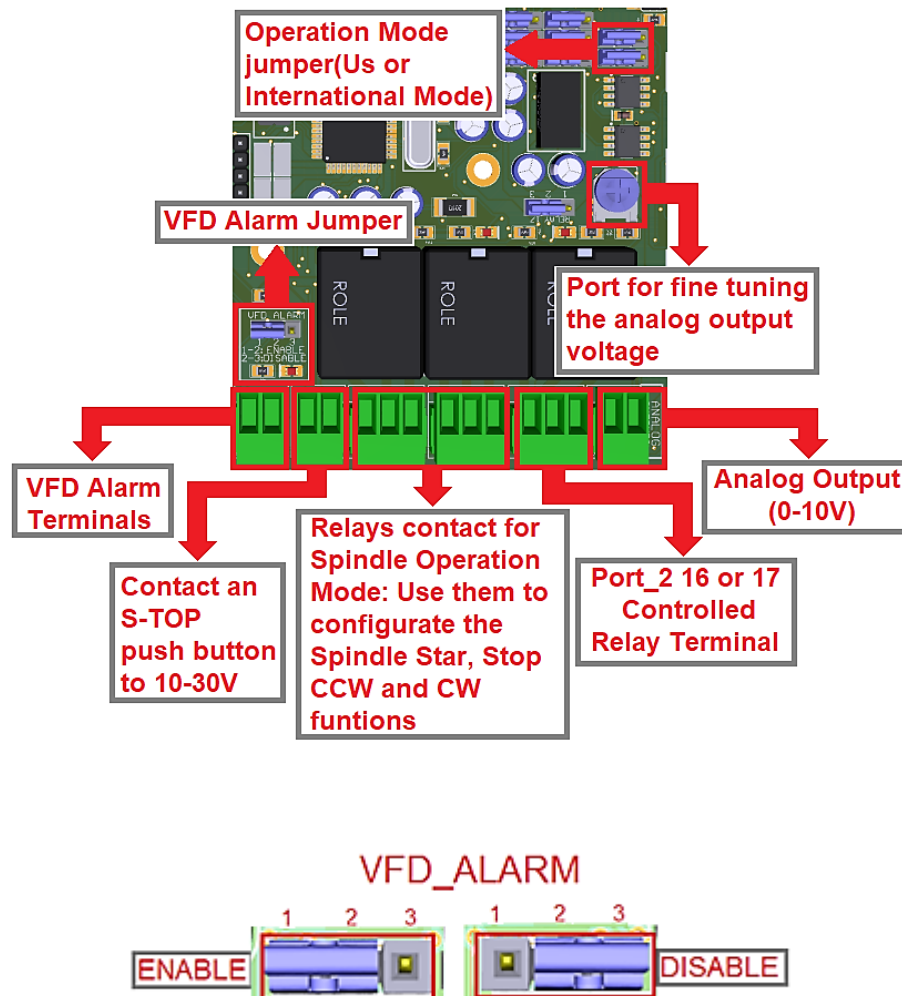
The **standby LED** lights indicate that the system is ready but disabled. When **Status LED**, (Green LED) lights, it indicates that the system is enabled.

There are 4 possible error sources: a driver fault, E-STOP error, SCHP error or VFD alarm. A LED will light close to the source of the fault.



VFD Connection and configuration jumper

The VFD Alarm monitoring feature can be enabled or disabled:



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_SOFTWARE.pdf

For Dipswitch configuration go to

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

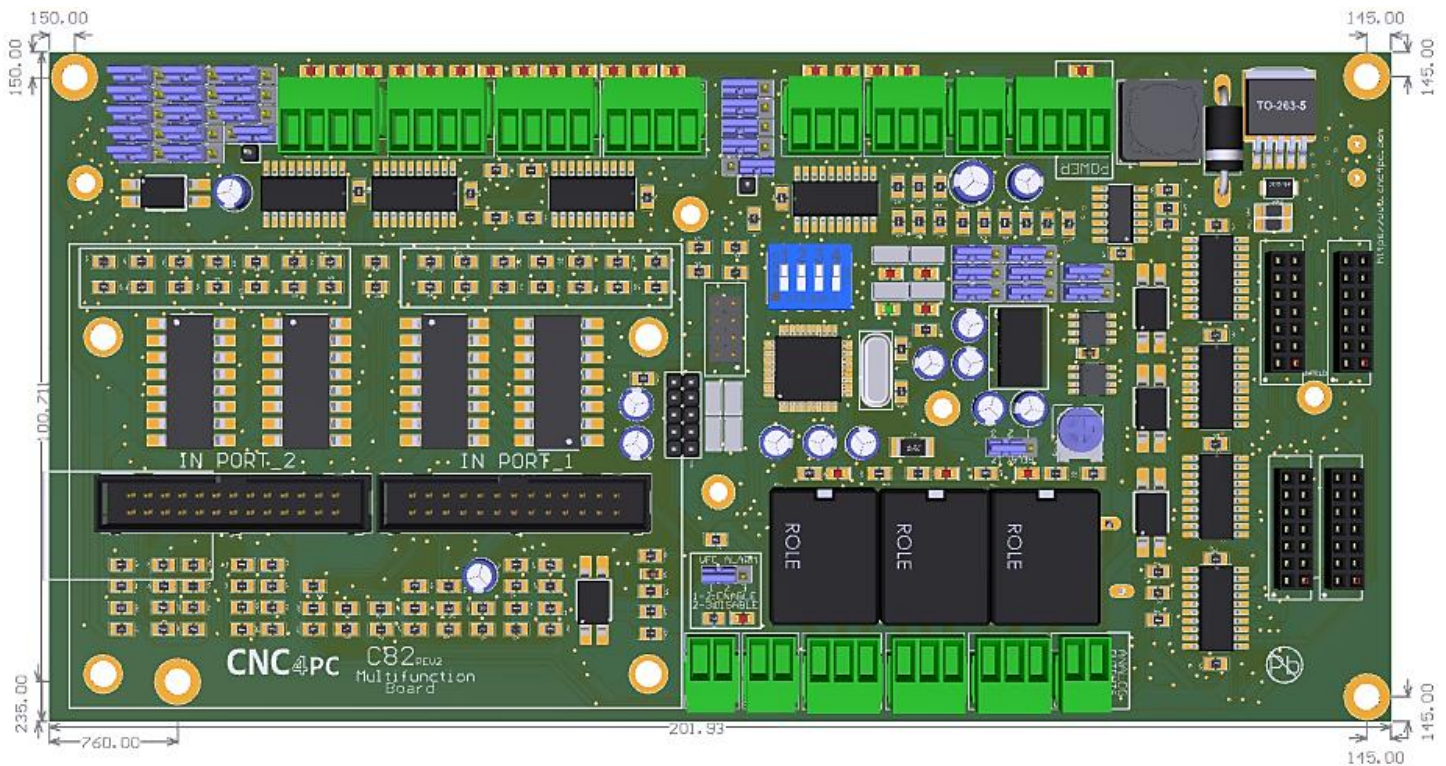
For Replacing Potentiometer go to

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

ESS MOTHER BOARD

<https://cnc4pc.com/ethernet-smooth-stepper-board.html>

4.0 DIMENSIONS



All dimensions are in Millimeters.

Fixing holes (4mm)

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.