

# CNC4PC C82 Multifunction Cnc Board User Manual

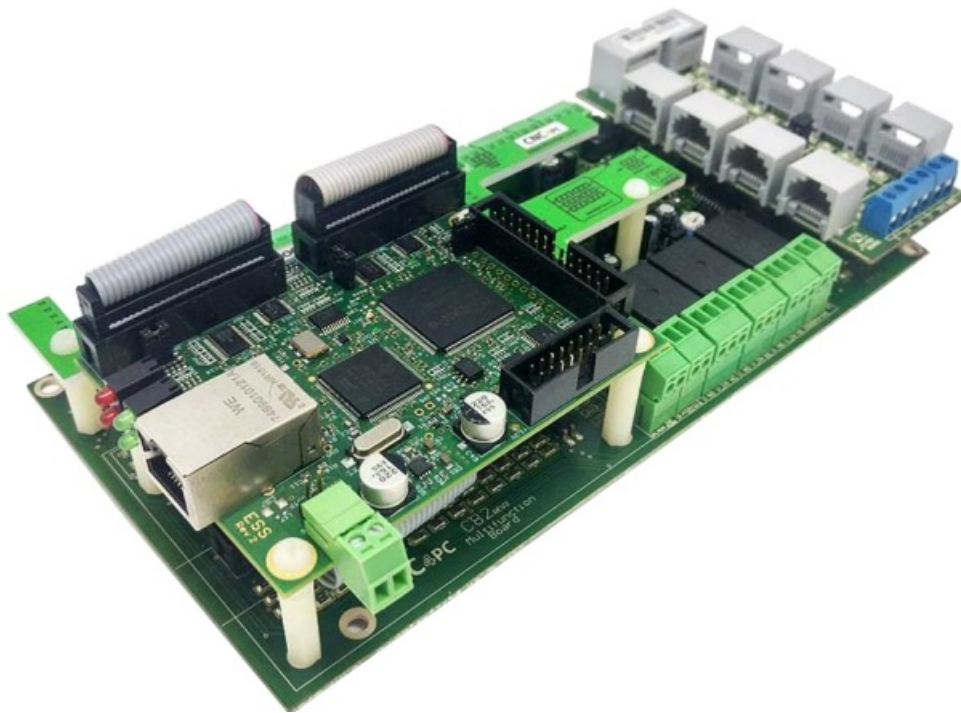
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# CNC<sup>4</sup>PC

**CNC4PC C82 Multifunction Cnc Board**



## 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.
- Optoisolated inputs working at 5-24VDC.
- Outputs can be 500mA open collector or +5vdc at 50mA TTL.
- Buffered outputs.
- Electromechanical Relay with NO and NC positions for general purpose (Port\_2 16 or 17, jumper-selectable).
- Microcontroller-based SCHP.
- Can be powered with a voltage +24VDC.
- 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.
- High speed input \*New

## I/O SPECIFICATIONS

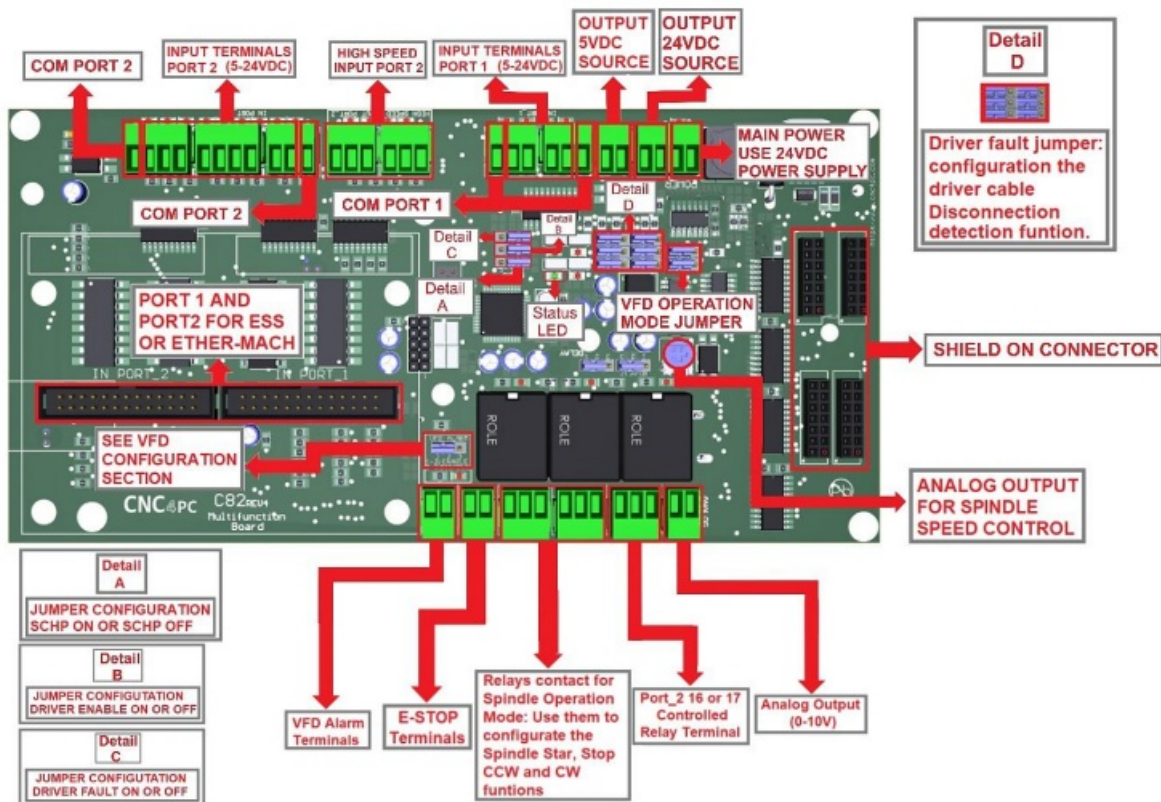
OPTOISOLATED DIGITAL INPUT TTL SPECIFICATIONS	
On-state voltage range	5 to 24VDC
Maximum off-state voltage	0.8V
Typical signal delay	2.8uS

DIGITAL OUTPUT TTL SPECIFICATIONS	
Maximum output voltage	5VDC
Maximum output current	24mA
Maximum off-state voltage	0.44 V
Maximum supported frequency	400KHz
Typical signal delay	10nS
Time of transition to high impedance state	12nS

OPEN COLLECTOR OUTPUT SPECIFICATIONS	
Number of outputs	4
Maximum Supported output voltage	50VDC
Typical output current (general purpose pins)	500mA
Maximum supported frequency	250KHz
Typical signal delay	Less than 8nS

ENCODER INPUT	
On-state voltage	5 VDC
Maximum off-state voltage	0.8V
Typical signal delay	2.8uS
Rise / Fall Time (Typ)	50ns – 12ns

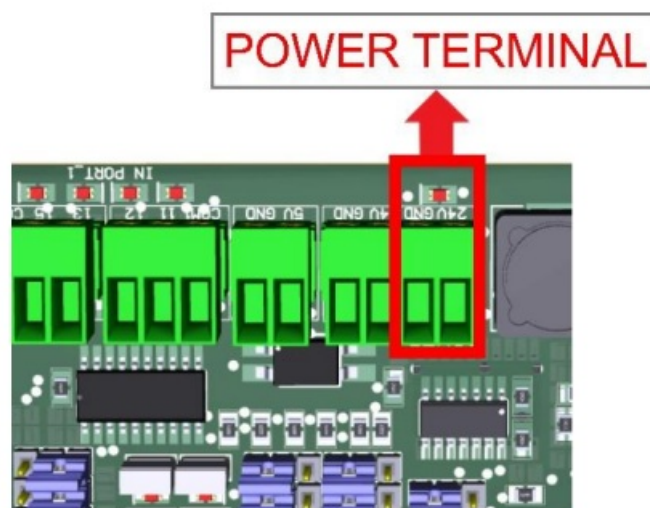
## BOARD DESCRIPTION



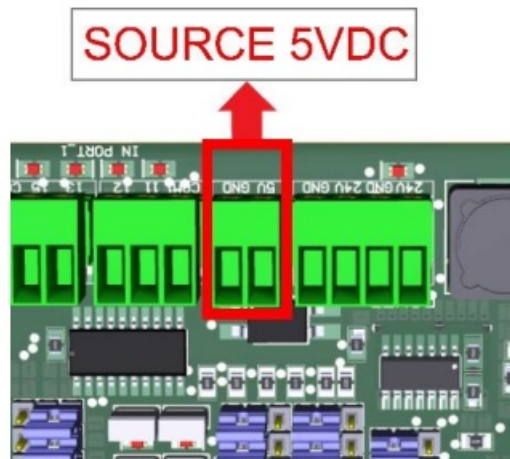
## POWER TERMINALS AND CONFIGURATION JUMPERS

### Power terminal

The board requires an external power supply which can deliver 24VDC@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.

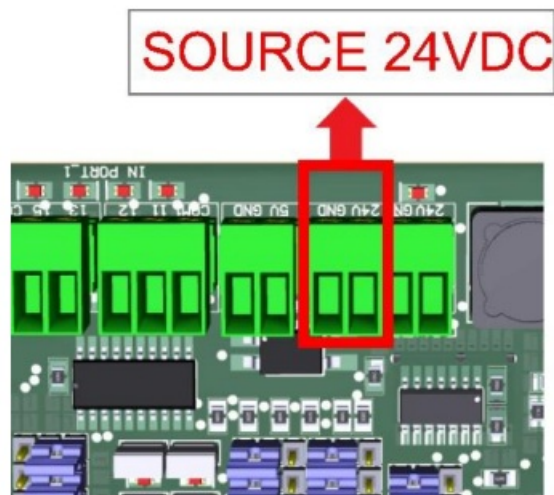


### Source Output 5VDC



### Source Output 24VDC

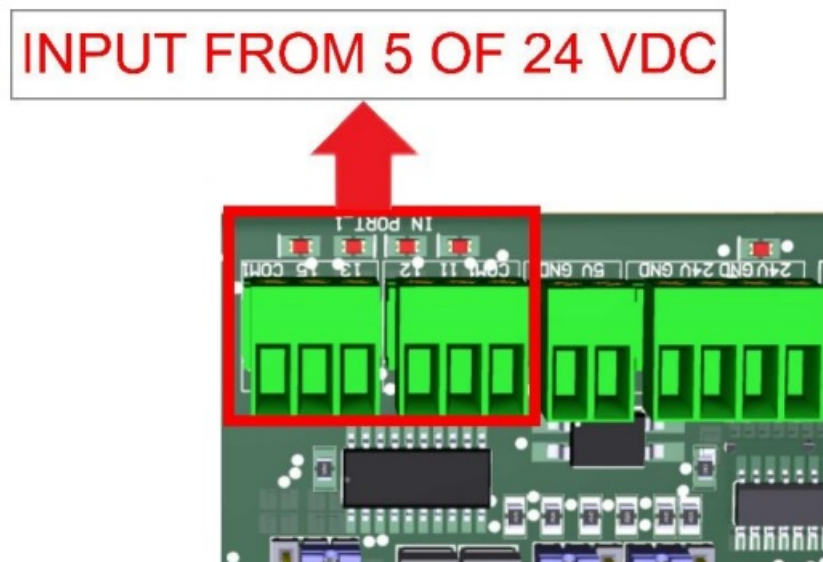
10-24VDC can be sourced to sensors or other cards requiring it.



### Input terminals for port\_1 and port\_2

These terminals support signals 5-24VDC, you can connect sensors NPN, PNP, switches, capacitive sensors, etc.

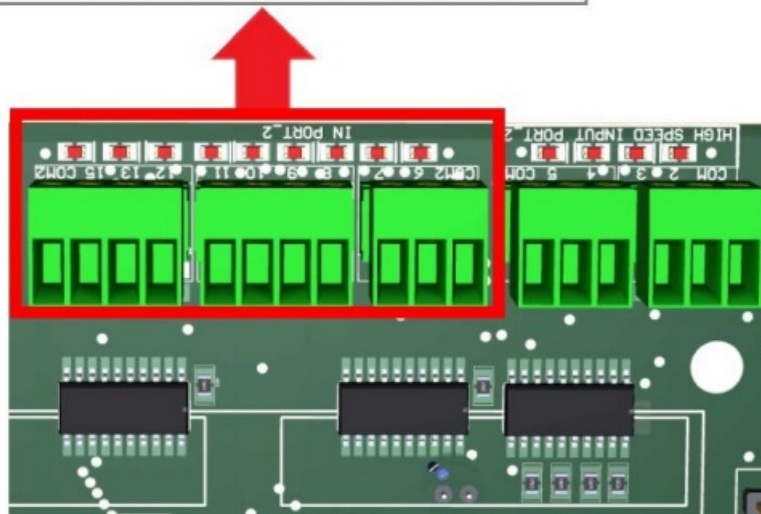
### PORT\_1





## PORT\_2

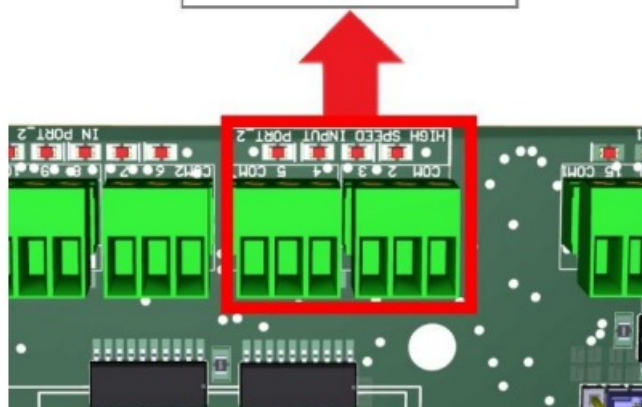
INPUT FROM 5 OF 24 VDC



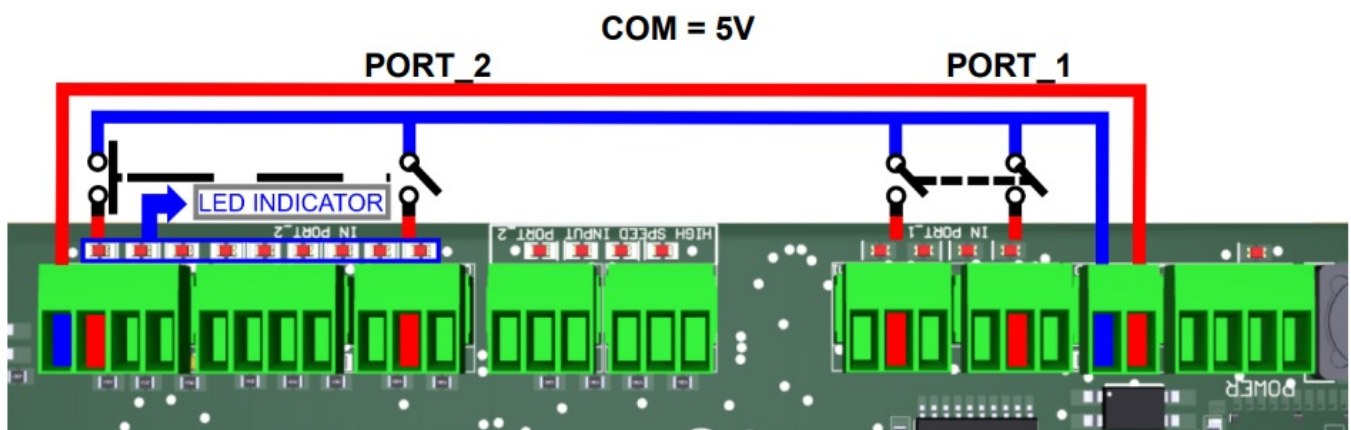
### HIGH SPEED INPUT PORT\_2 PIN 2, 3, 4 AND 5

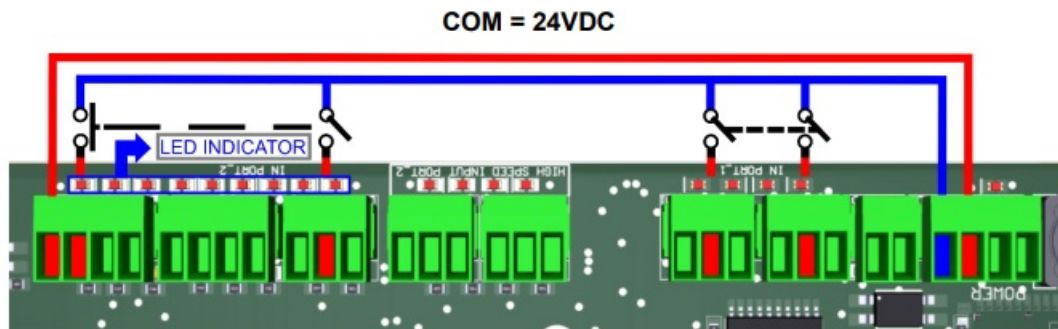
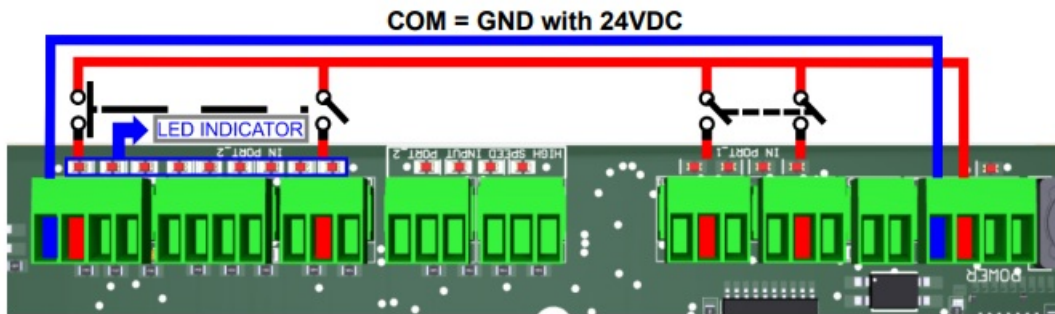
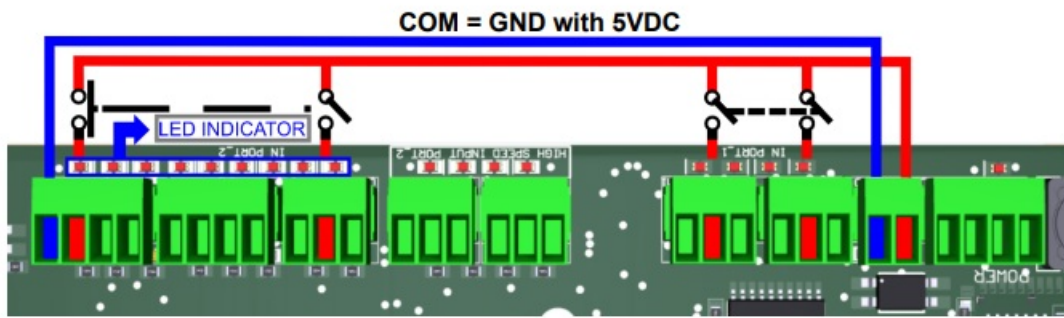
These terminals support signals 5VDC

INPUT 5 VDC

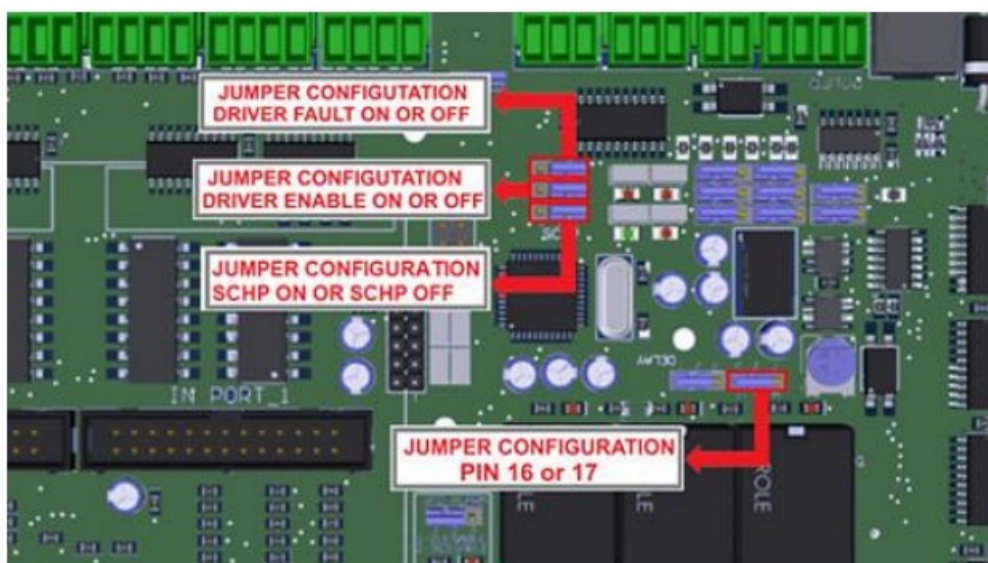


Select inputs of port\_1 and port\_2





## JUMPER POSITION

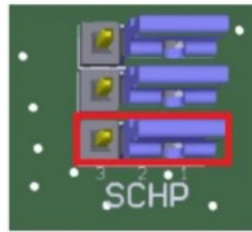


## Selecting the SCHP operation mode

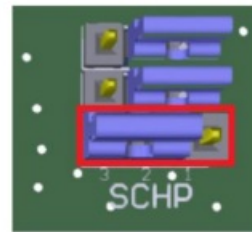
The Safety Charge Pump uses pin 17 on port 2. When the SCHP is enabled on the board, then the output of the terminals will be active while the Safety Charge Pump signal is present and inactive while the SCHP is not

present.

**1-2: SCHP ON**



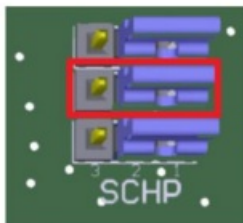
**2-3: SCHP OFF**



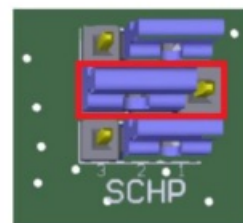
**Note:** also, that Relay3 on can also be tied to pin 17 or 16 on port 2. If the jumper is set to be tied to pin 17, then the relay will activate while the system is active. This can be ideal to control power to DC servos or to handle servo brakes. Or enable/disable any other feature that is associated to the system been active.

#### Jumper configuration driver enable

**1-2: Driver enable ON**

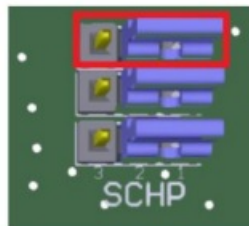


**2-3: Driver enable OFF**

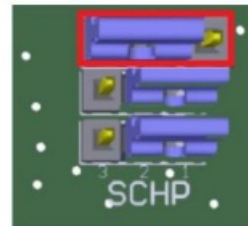


#### Jumper configuration driver fault

**1-2: Driver fault ON**

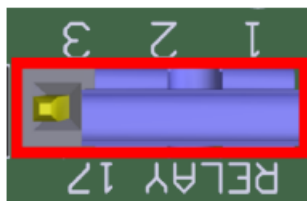


**2-3: Driver fault OFF**



#### Configuration jumper pin 16 or 17

**1-2: PIN17**



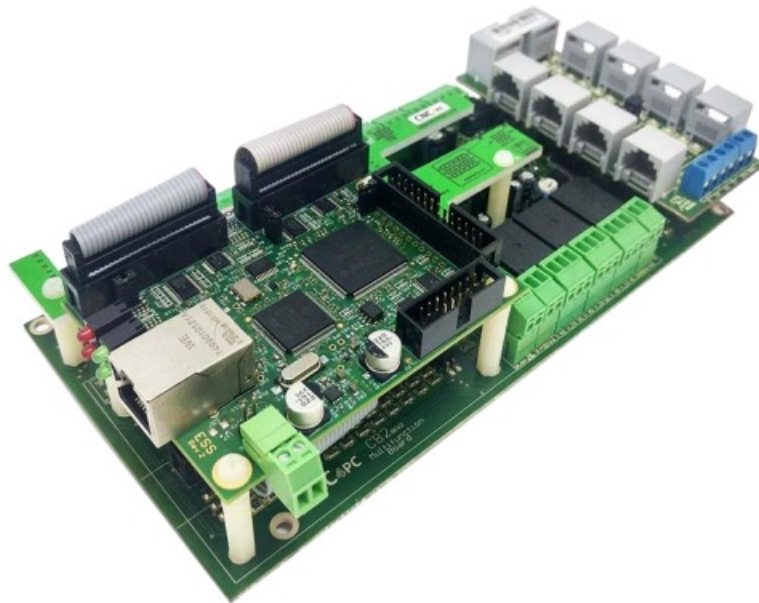
**2-3: PIN16**



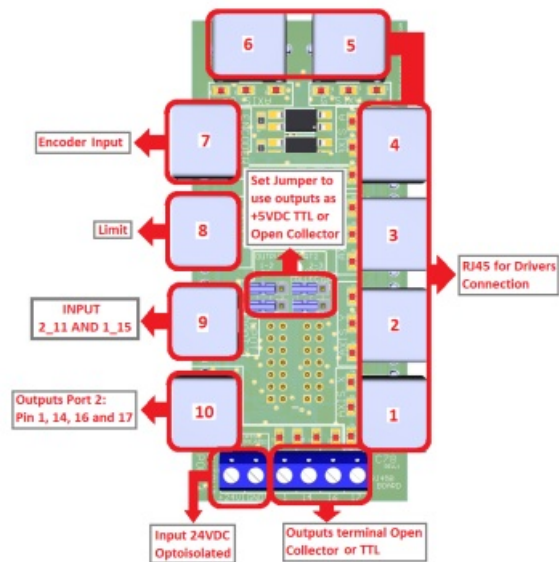
#### CONNECTION EXAMPLE FOR SHIELD C78

RJ45 shield C78 connection for axes, Limits and Encoder





## RJ45 shield board description



## Pinout



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

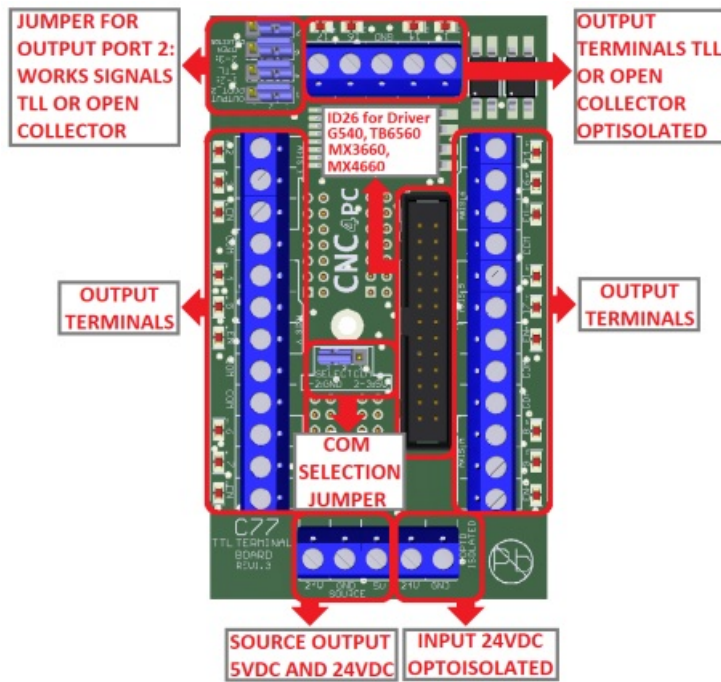
RJ45_7		RJ45_8		RJ45_9		RJ45_10	
RJ45 PIN	P.P. PIN	RJ45 PIN	P.P. PIN	RJ45 PIN	P.P. PIN	RJ45 PIN	P.P. PIN
1	GND	1	GND	1	GND	1	GND
2	5VDC	2	1_13	2	NC	2	2_17
3	NC	3	1_12	3	NC	3	2_16
4	2_4(INDEX)	4	1_11	4	2_11	4	2_1
5	NC	5	1_15	5	1_15	5	2_14
6	2_2(enc. A)	6	2_11	6	NC	6	NC
7	NC	7	12/24VDC	7	12/24VDC	7	5VDC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

## CONNECTION EXAMPLE FOR SHIELD C77

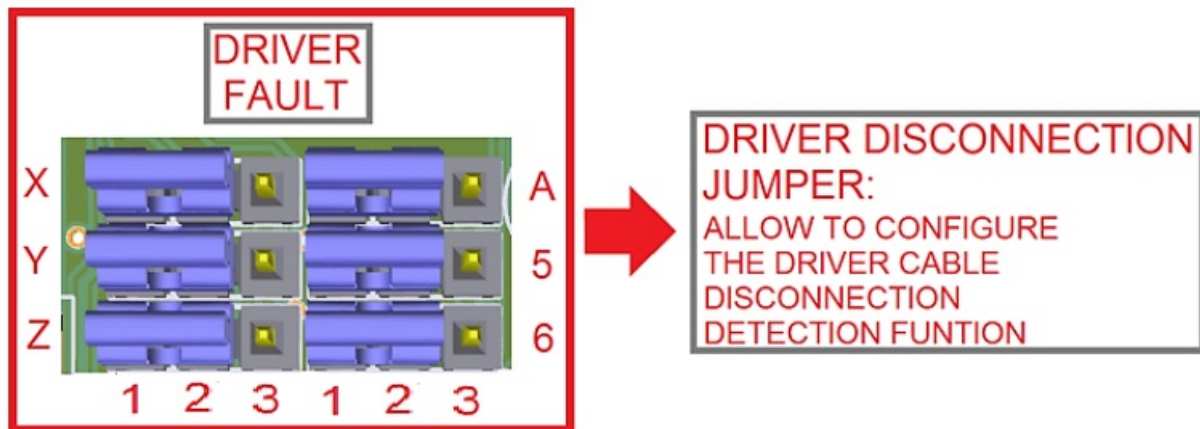
### Terminal Shield Screw-on



## Shield board description



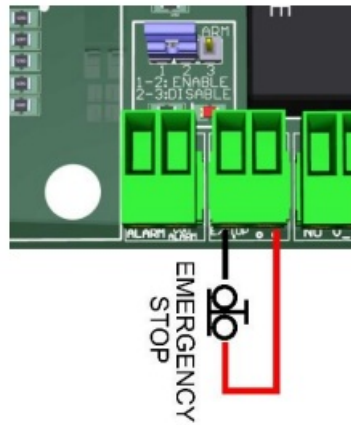
## DRIVER DISCONNECTION JUMPERS



**Nota:** 1-2: Cable disconnection detection. 2-3: No cable disconnection detection. This configures how cable disconnect is to work. Set according to C34 board manual.

## E-STOP TERMINAL

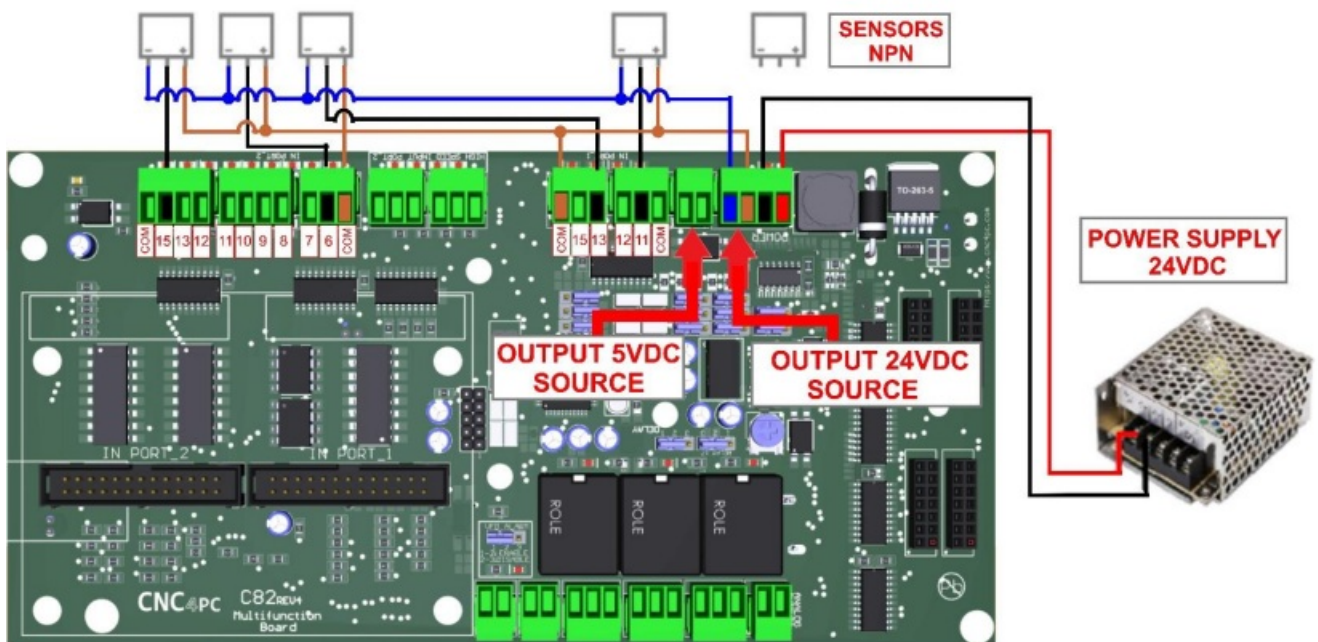
Connect an E-STOP push button as is shown in the below images.



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.

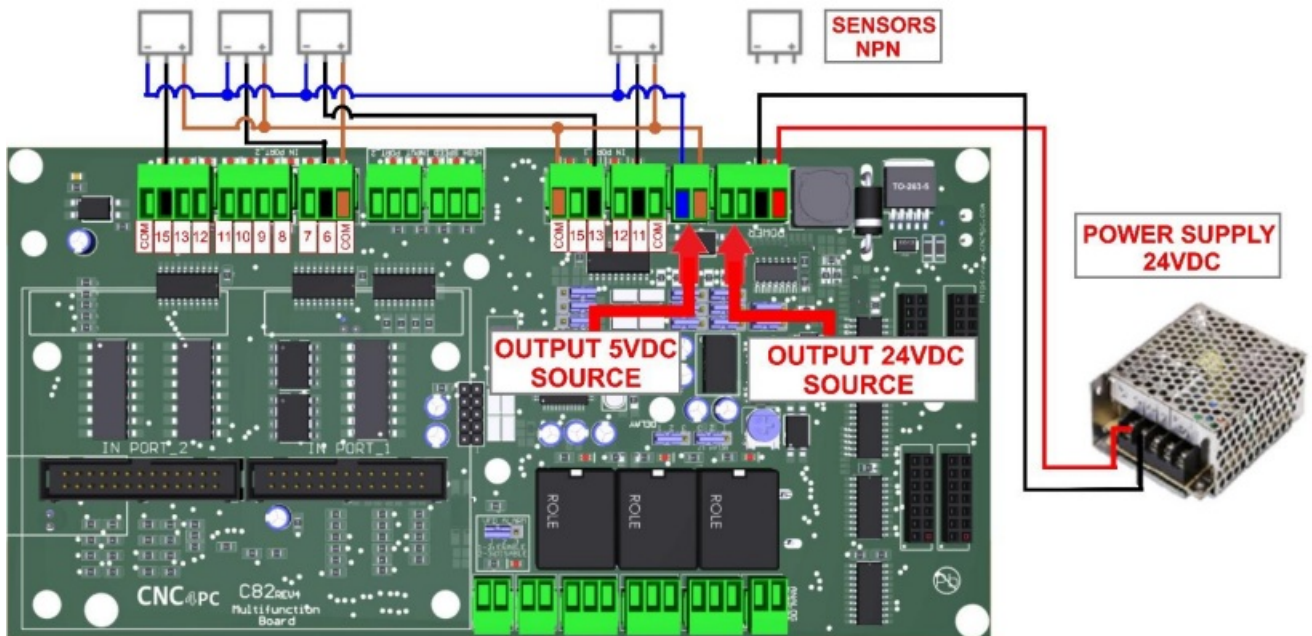
## TYPICAL CONNECTIONS

- Connection with the terminal of output source of 24VDC



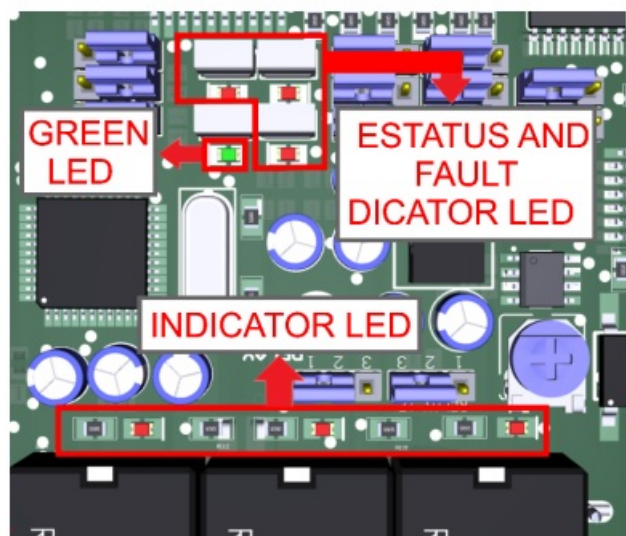
- Connection with the terminal of output source of 5VDC





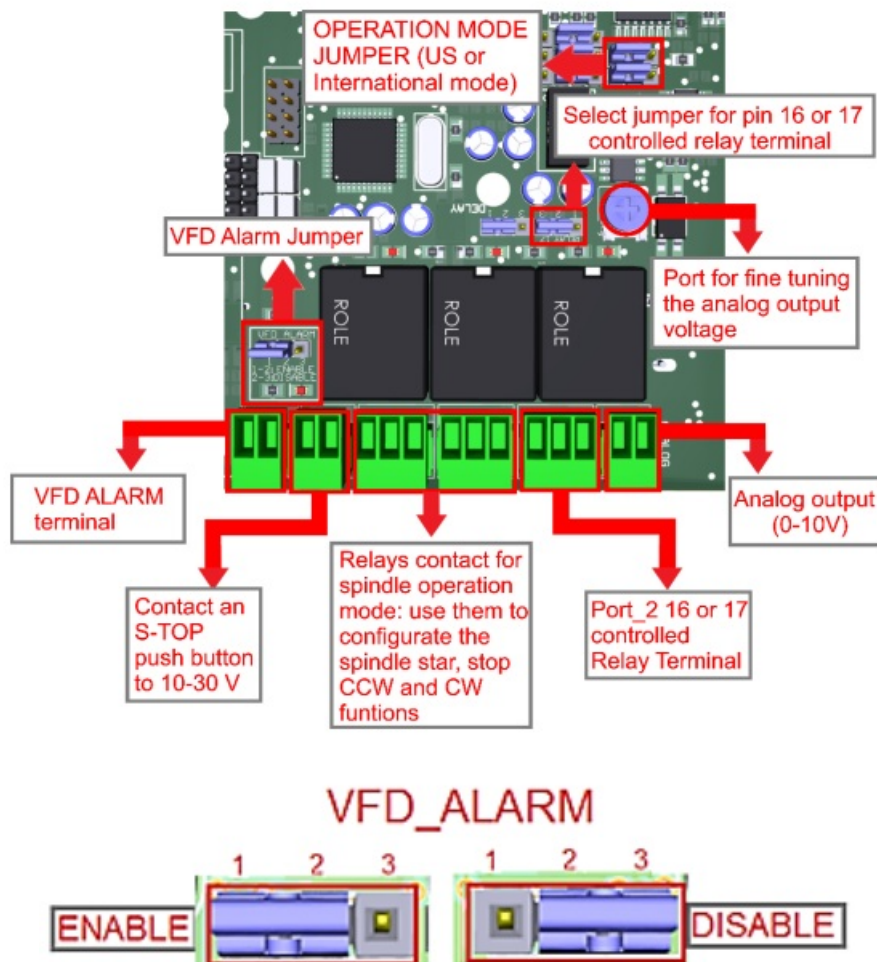
## LED INDICATOR

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

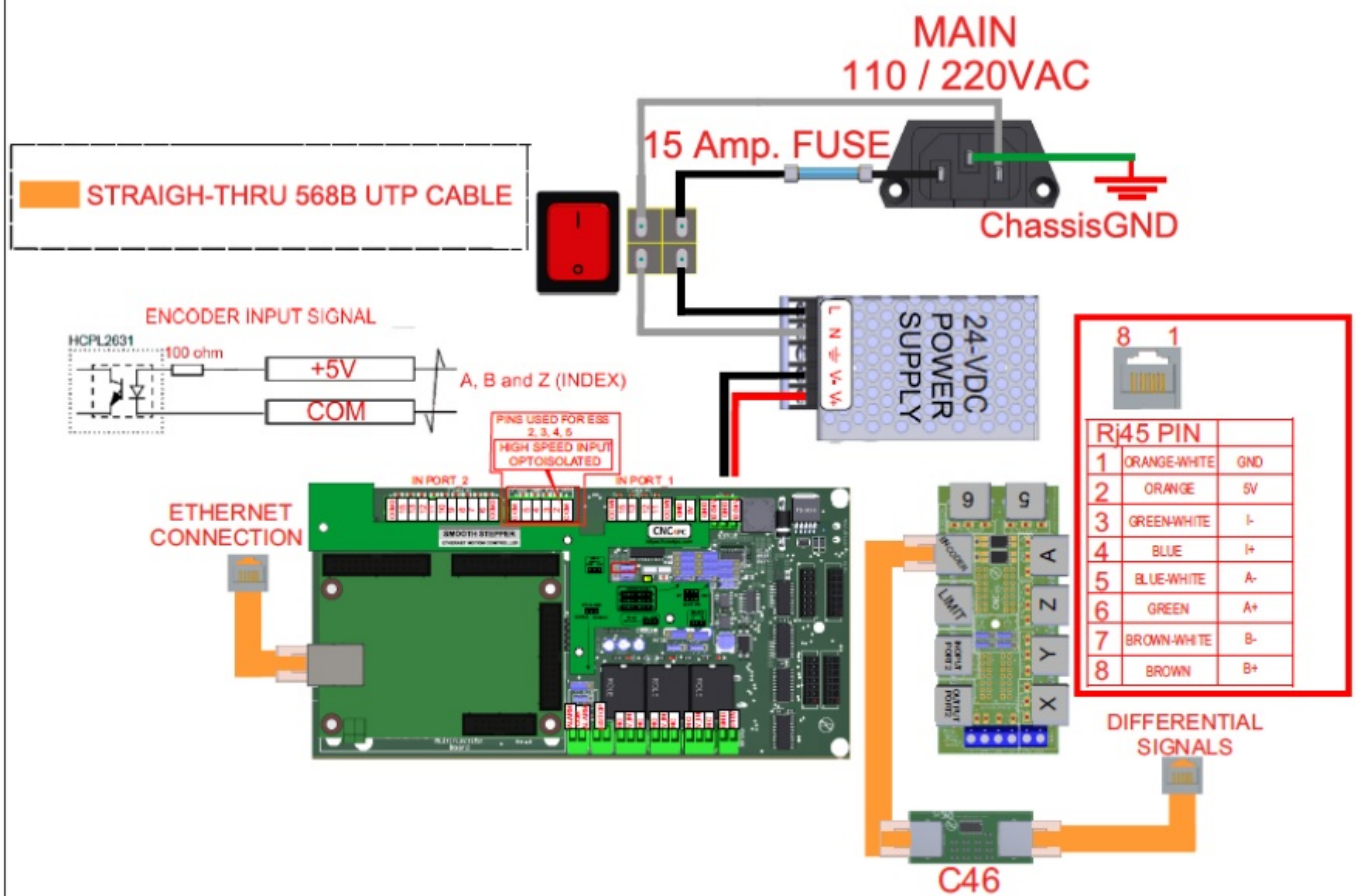
The VFD Alarm monitoring feature can be enabled or disabled:



The VFD Alarm will trigger when the contacts are open and the VFD Alarm is enabled.

- For the Variable speed control go to [http://cnc4pc.com/Tech\\_Docs/VARIABLE\\_SPEED\\_CONTROL.pdf](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](http://cnc4pc.com/Tech_Docs/CONFIGURATION_OF_CONTROL_SOFTWARE.pdf)
- For Replacing Potentiometer go to [http://cnc4pc.com/Tech\\_Docs/Replacing%20a%20Potentiometer.pdf](http://cnc4pc.com/Tech_Docs/Replacing%20a%20Potentiometer.pdf)
- ESS MOTHER BOARD <https://cnc4pc.com/ethernet-smooth-stepper-board.html>

## SAMPLE ENCODER WIRING

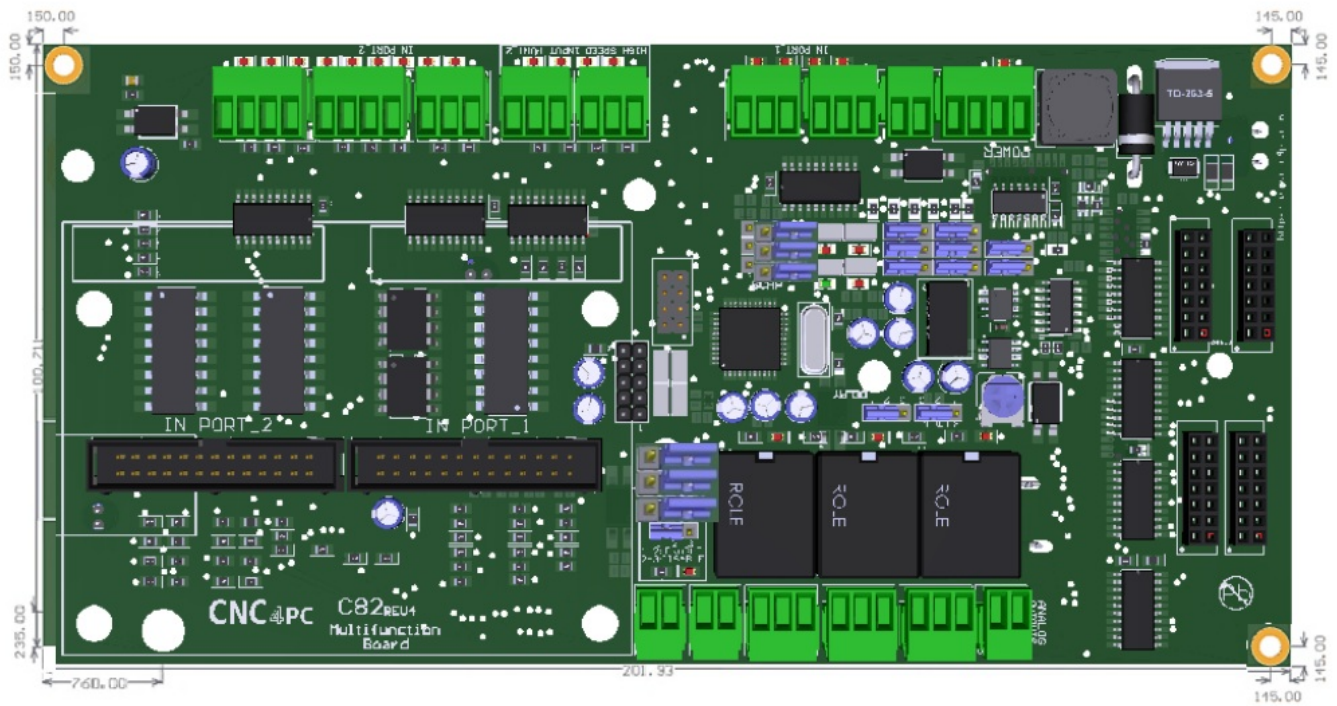


**Note :**

This wiring is just to illustrate a sample product application.  
Specific wiring may vary from system to system.  
It is the users responsibility to implement it correctly.

<b>CNC<sup>4</sup>PC</b> Integration Solutions for CNC Projects <a href="http://www.cnc4pc.com">http://www.cnc4pc.com</a>	
Designed : DOR	Date : MAY-11-2021
Revised : KPG	Date : MAY-11-2021
Item : WS_296	Ver. : 1
Description : Wiring sample C82 for Encoder input	

## 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 is 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.

#### Documents / Resources

	<p><a href="#">CNC4PC C82 Multifunction Cnc Board</a> [pdf] User Manual C82 Multifunction Cnc Board, C82, Multifunction Cnc Board, Cnc Board</p>
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