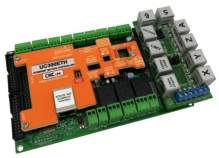
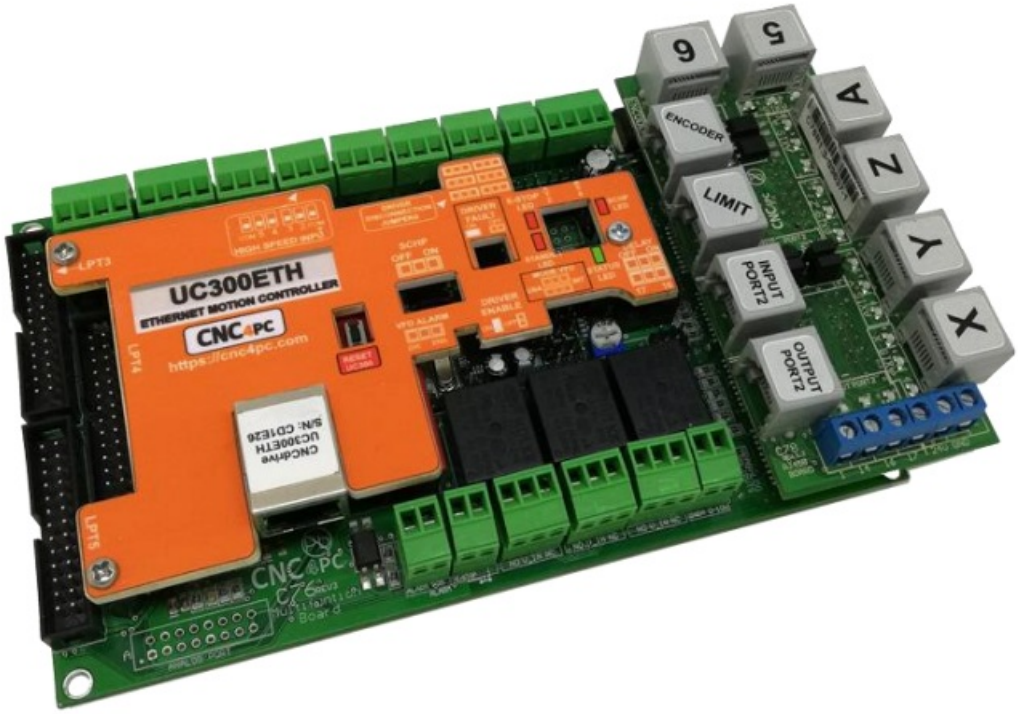


CNC4PC C76 Multifunction CNC Board User Manual

Contents

CNC4PC C76 Multifunction CNC Board



FEATURES

- Designed for UC300ETH motion controller.
- 3 Expansion Ports. It has 3 x IDC26 connector for adding Breakout or Relay Boards.
- 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.
- Outputs can be 500mA open collector or +5vdc at 50mA TTL.
- Electromechanical Relay with NO and NC positions for general purpose (Port_2 16 or 17, jumper-selectable).
- Microcontroller-based SCHP.
- Optoisolated inputs working at 5-24VDC.
- 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.
- High speed input *New

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

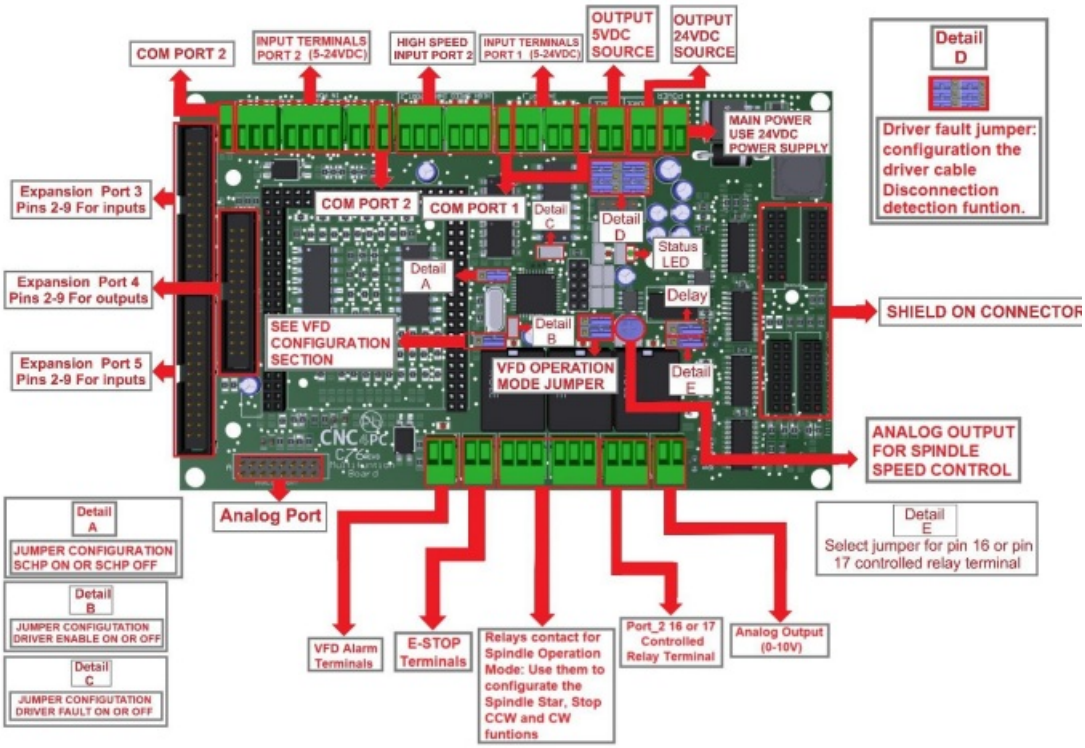
OPTOISOLATED DIGITAL INPUT TTL SPECIFICATIONS	
On-state voltage range	5 to 24VDC
Maximum off-state voltage	0.8V
Typical signal delay	2.8uS

DIGITAL OUTPUT TTL SPECIFICATIONS	
Maximum output voltage	5VDC
Maximum output current	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

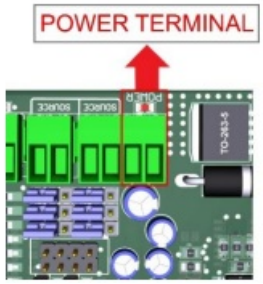
BOARD DESCRIPTION



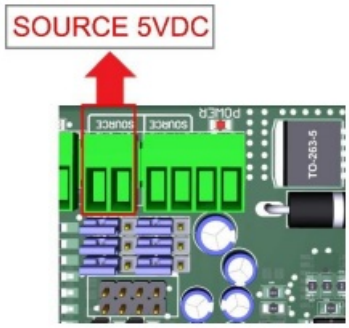
POWER TERMINALS AND CONFIGURATION JUMPERS

Power terminal

The board requires an external power supply which can deliver 10-30VDC@700mA to power the logic of the board and the UC300, 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.

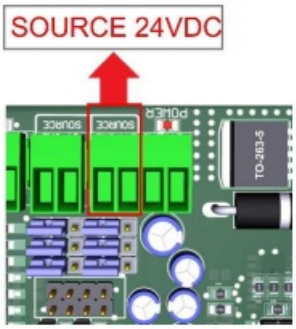


Source Output 5VDC



Source Output 10-30VDC

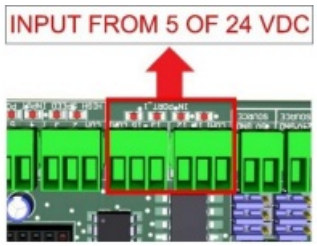
10-30VDC can be sourced to sensors or other cards requiring it.



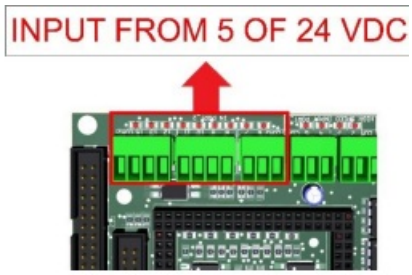
Input terminals for port_1 and port_2

These terminals support signals 10-24VDC, you can connect sensors NPN, PNP, switches, capacitive sensors, etc. set jumpers depending on signal voltage.

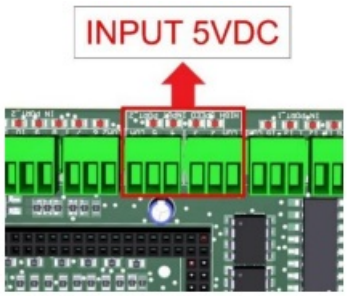
PORT_1



PORT_2

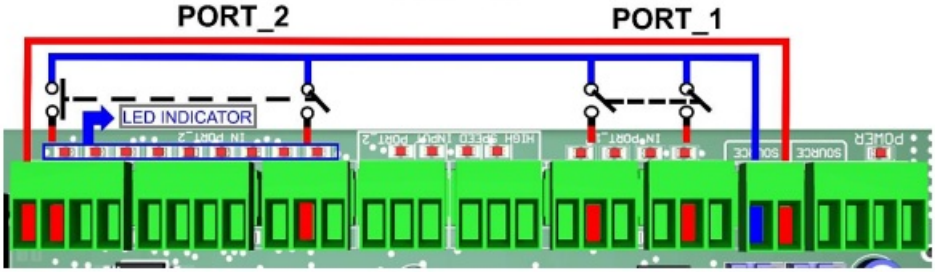


HIGH-SPEED INPUT PORT_2 PIN 2, 3, 4 AND 5
These terminals support signals 5VDC

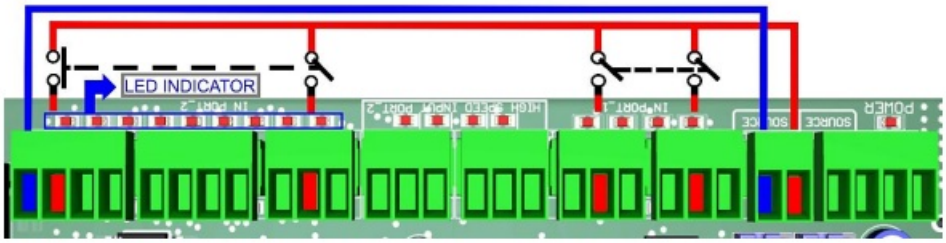


Select inputs of port_1 and port_2
Set COM = +5VDC, GND or 10-24VDC to determine the common for the input signals to be used.

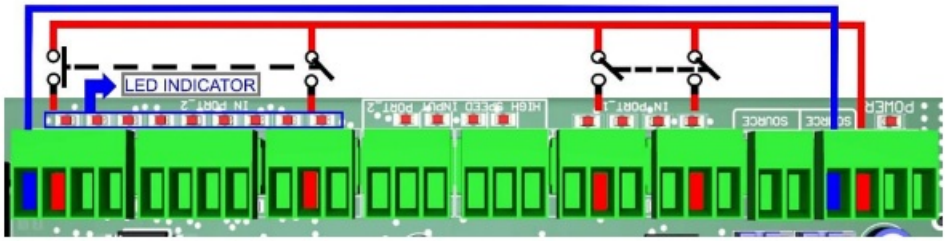
COM = 5V



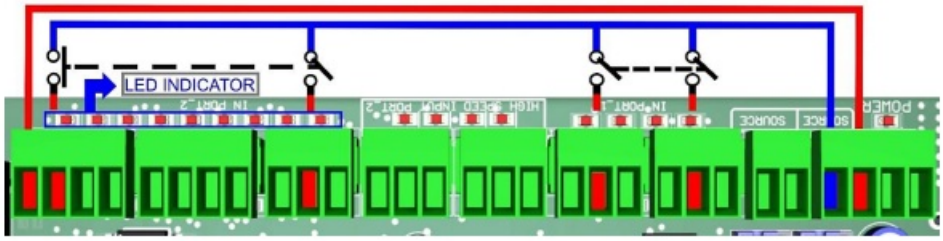
COM = GND with 5VDC



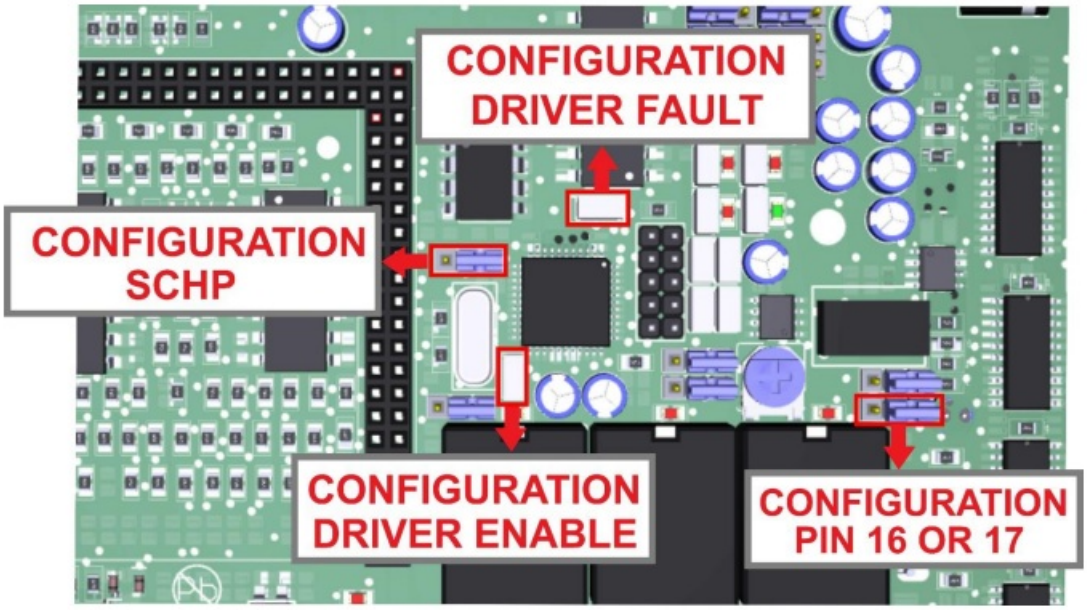
COM = GND with 24VDC



COM = 24VDC



JUMPER POSITION



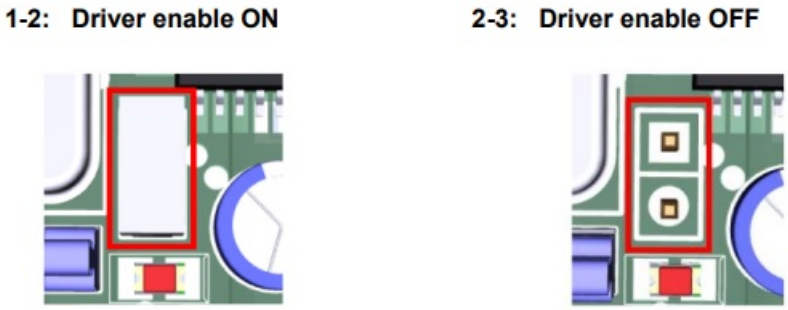
Selecting the SCHP operation mode

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.

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

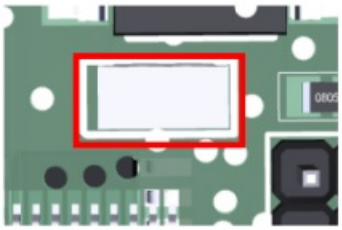
When you need to use the Driver enable to ON put the jumper, if you need it OFF remove the jumper



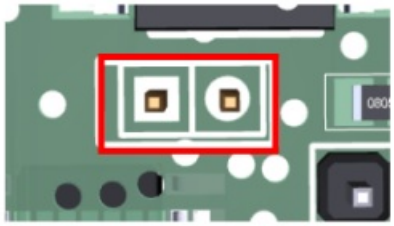
Jumper configuration driver fault

When you need to use Driver Fault to ON set the jumper, if you need to OFF remove the jumper.

1-2: Driver fault ON

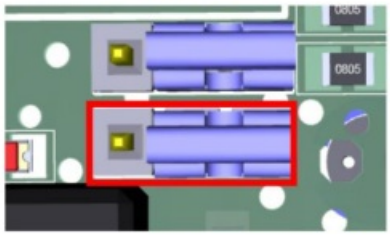


2-3: Driver fault OFF

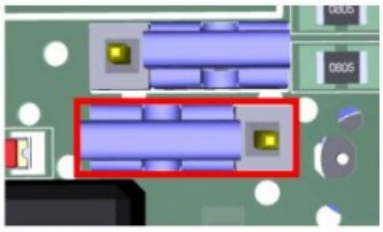


Configuration jumper pin 16 or 17

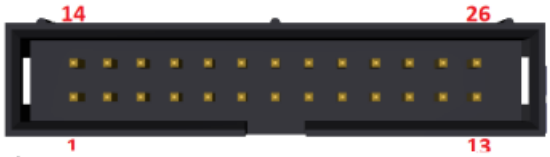
1-2: PIN16



2-3: PIN17



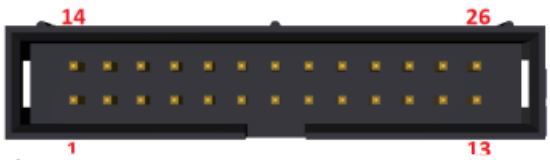
LPT_3 AND LPT 5 INPUT EXPANSION PORT



LPT 3/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	ENABLE

NOTE:
Output pin 18 can be used to enable expansion boards

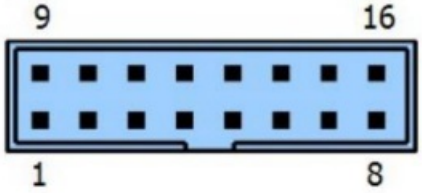
LPT_4 OUTPUT EXPANSION PORT



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	ENABLE

ANALOG I/O PORT PINOUT.

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



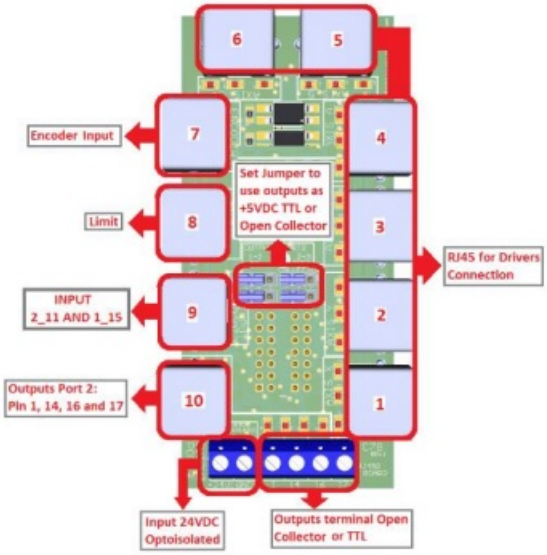
Pin	Signal direction
1	5 Volt output
2	Ground
3	Analog input 1.
4	Analog input 2.
5	Ground
6	Analog output 1.
7	Analog output 2.
8	5 Volt output
9	5 Volt output
10	Ground
11	Analog input 1.
12	Analog input 2.
13	Ground
14	Analog output 1.
15	Analog output 2.
16	5 Volt output

NOTE:
Analog I/Os are not isolated.

CONNECTION EXAMPLE FOR SHIELD C78

RJ45 shield C78 connection for axes, Limits, and Encoder

RJ45 shield board description



Pinout

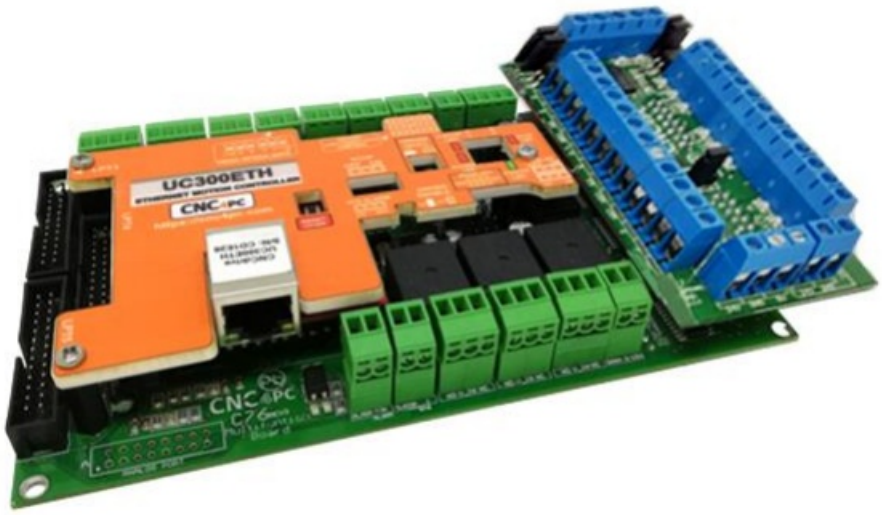
RJ45 Distribution

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

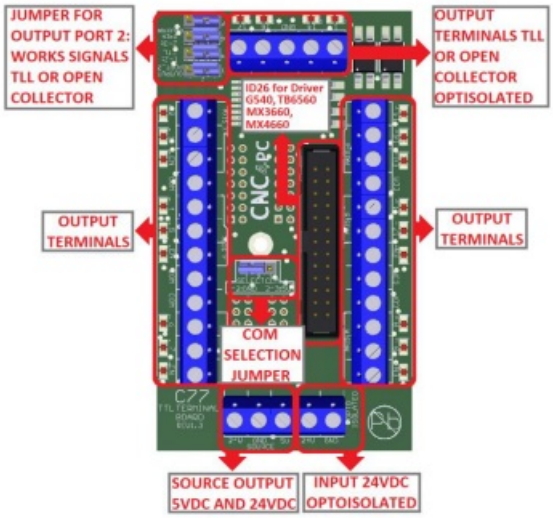
RJ45_7		RJ45_8		RJ45_9		RJ45_10	
RJ45 PIN	**P.P. PIN**	**RJ45 PIN**	**P.P. PIN**	**RJ45 PIN**	**P.P. PIN**	**RJ45 PIN**	**P.P. PIN**
1	GND	1	GND	1	GND	1	GND
2	5VDC	2	1_13	2	NC	2	2_17
3	NC	3	1_12	3	NC	3	2_16
4	2_4(INDEX)	4	1_11	4	2_11	4	2_1
5	NC	5	1_15	5	1_15	5	2_14
6	2_2(enc. A)	6	2_11	6	NC	6	NC
7	NC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

CONNECTION EXAMPLE FOR SHIELD C77

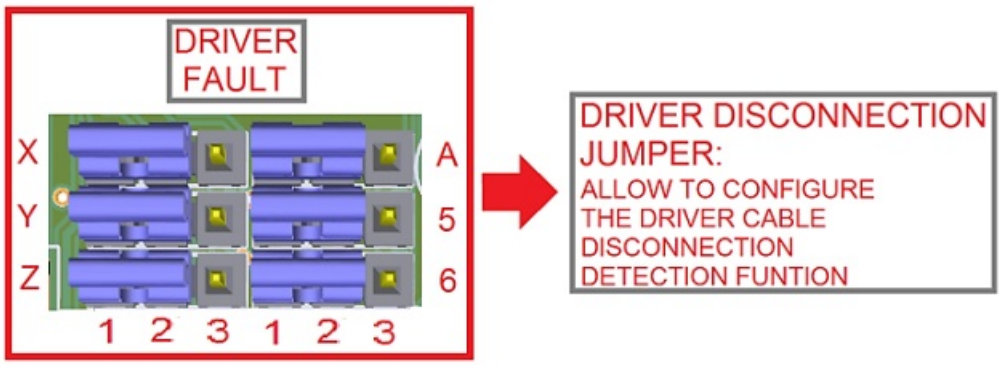
Terminal Shield Screw-on



Shield board description



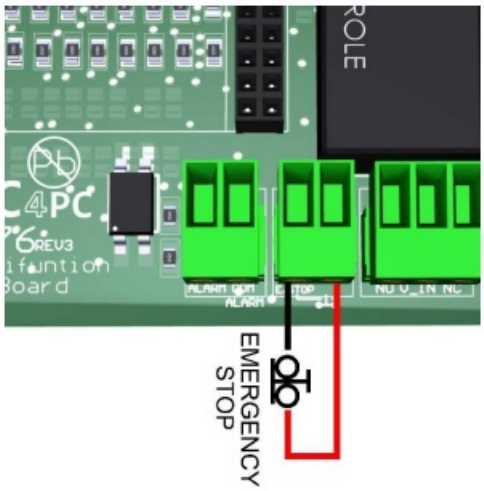
DRIVER DISCONNECTION JUMPERS



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

E-STOP TERMINAL

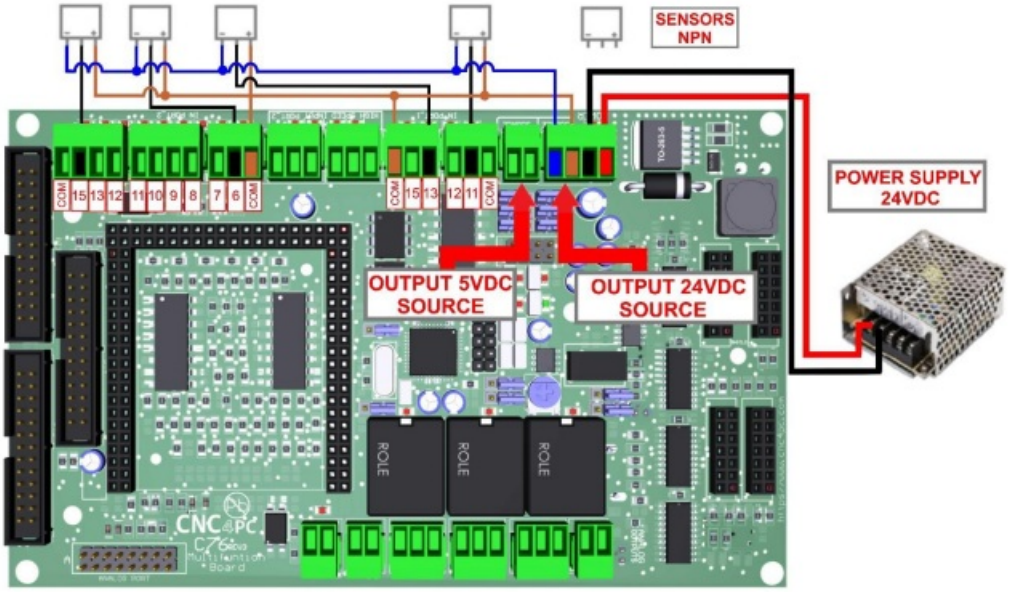
- Connect an E-STOP push button as is shown in the below images.



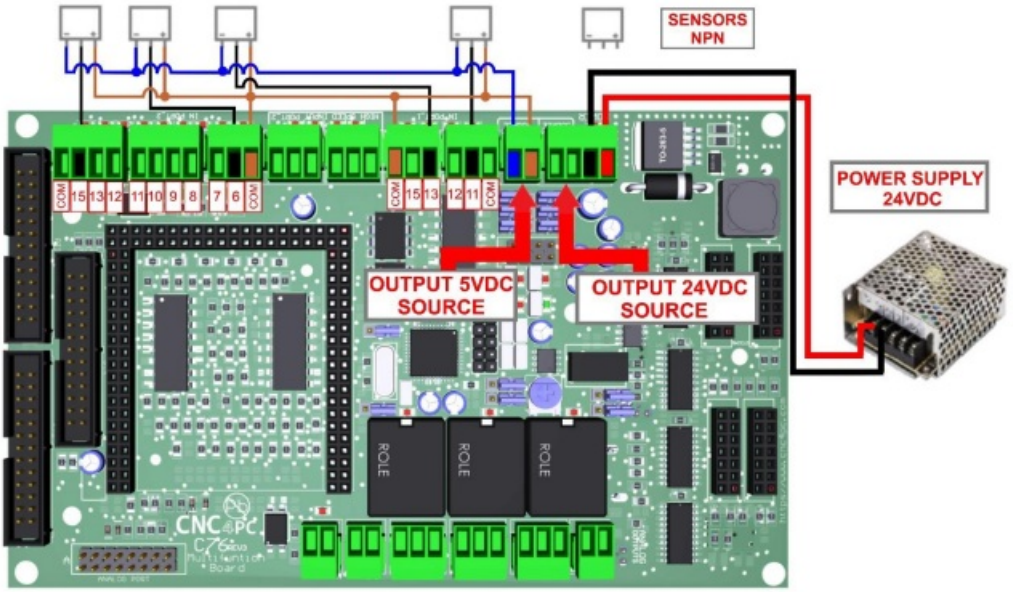
- Pin 10 port 1 is used for E-Stop. Since this board controls the enable line, and the enable line is the one responsible for notifying the controller of the e-stop condition, the user does not have a direct access to the pin itself, just to the e-stop terminal on the board. The E-Stop terminal is tied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

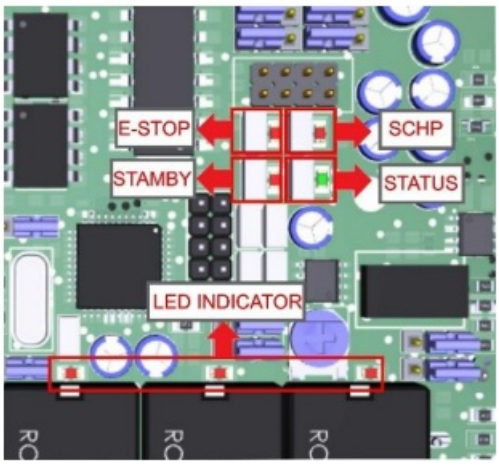


-Connection with the terminal of output source of the 5VDC



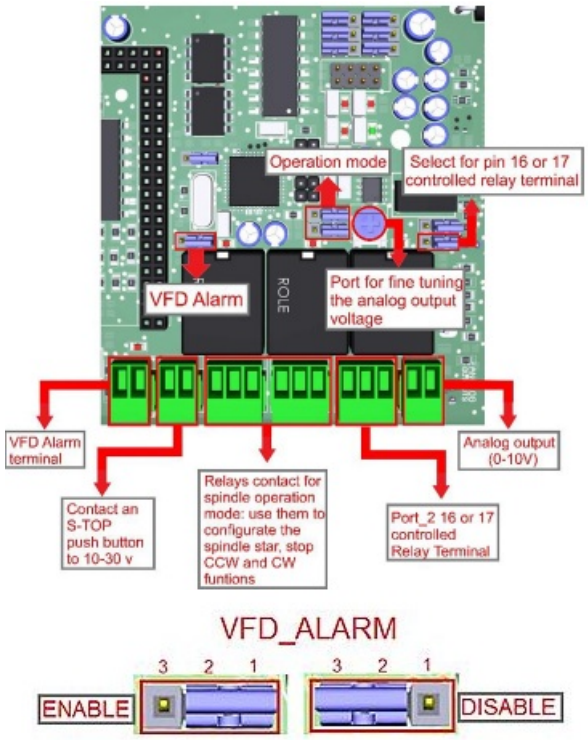
LED INDICATOR

- 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

For Configure the control software go to

- http://cnc4pc.com/Tech_Docs/CONFIGURATION_OF_CONTROL_SOFWARE.pdf

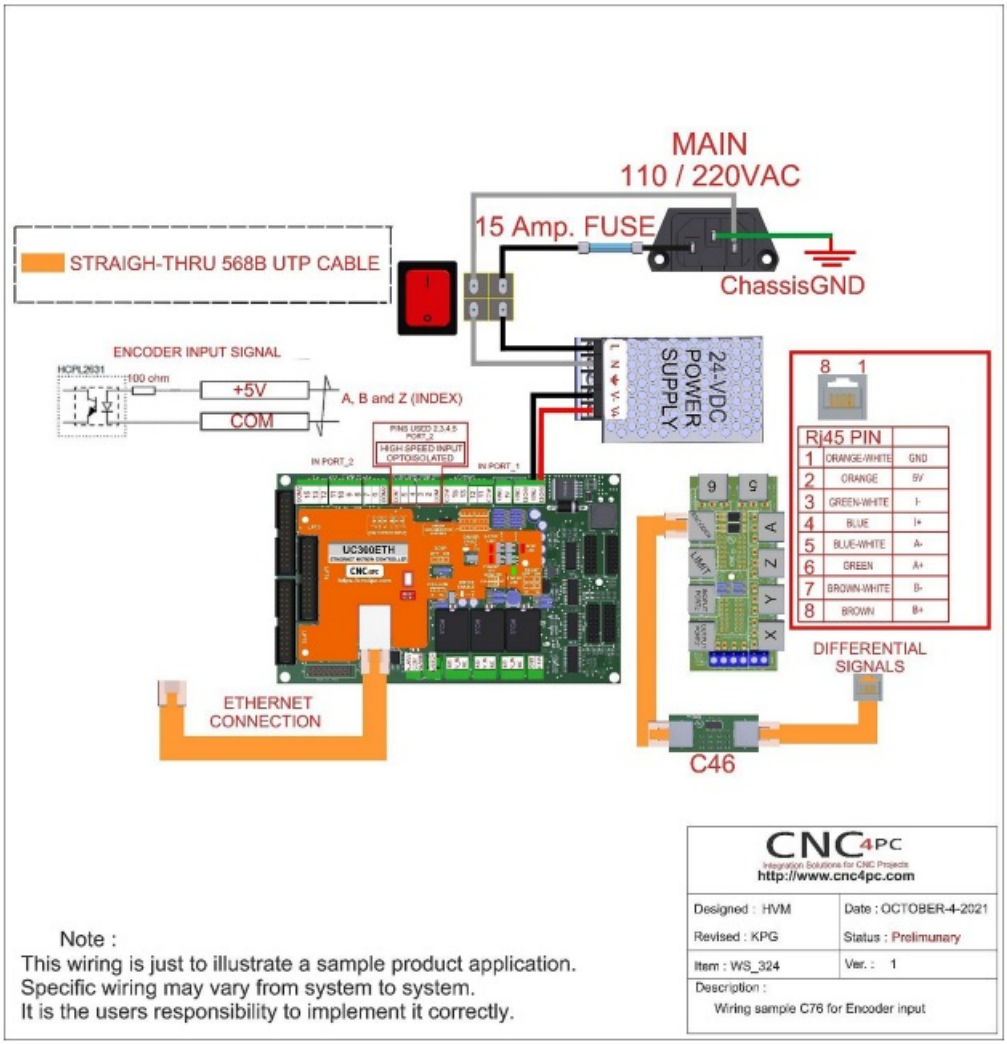
For Replacing Potentiometer go to

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

UC300ETH MOTHERBOARD

- https://cnc4pc.com/uc300eth-ethernet-motion-controller-b.html

WIRING SAMPLE ENCODER



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

	CNC4PC C76 Multifunction CNC Board [pdf] User Manual C76 Multifunction CNC Board, C76, Multifunction CNC Board, CNC Board