



Application:

CNC machines could be used as plotters, cutters, drilling machines and etc. as the axis on which they work are at least 2 (X, Y), depending on the type of application.

The machine consists of a computer, controller, driver for controlling the motors, motors and construction.

The controller changes the signal from the computer and transfers it to the driver for controlling the motor, controls the mandrel and some other devices needed in the process of work (cooling, vacuum cleaner and etc.). The connection between the computer and the controller can be realized through COM, LPT or USB port.

The drivers for controlling the motors are of several types depending on controlled motors: stepper motors, direct current motors. With the stepper motors a big accuracy is achieved but a small quick action, while with the others it is the reverse.

The size and the type of construction could vary (from non – professional to a professional one).



CNC Контролер - CNC3AX:

Communication: LPT PORT.

Software: MACH2, MACH3, CNFRAISE, KELLYCAM, CNCPRO, WINPCNC, DESKNC, NINOS, CNC3AXES, ...

Linear Interpolation: 3 axes (X, Y и Z).

Three drivers for unipolar stepper motor.

Current control, FULL, HALF, CONTROL.

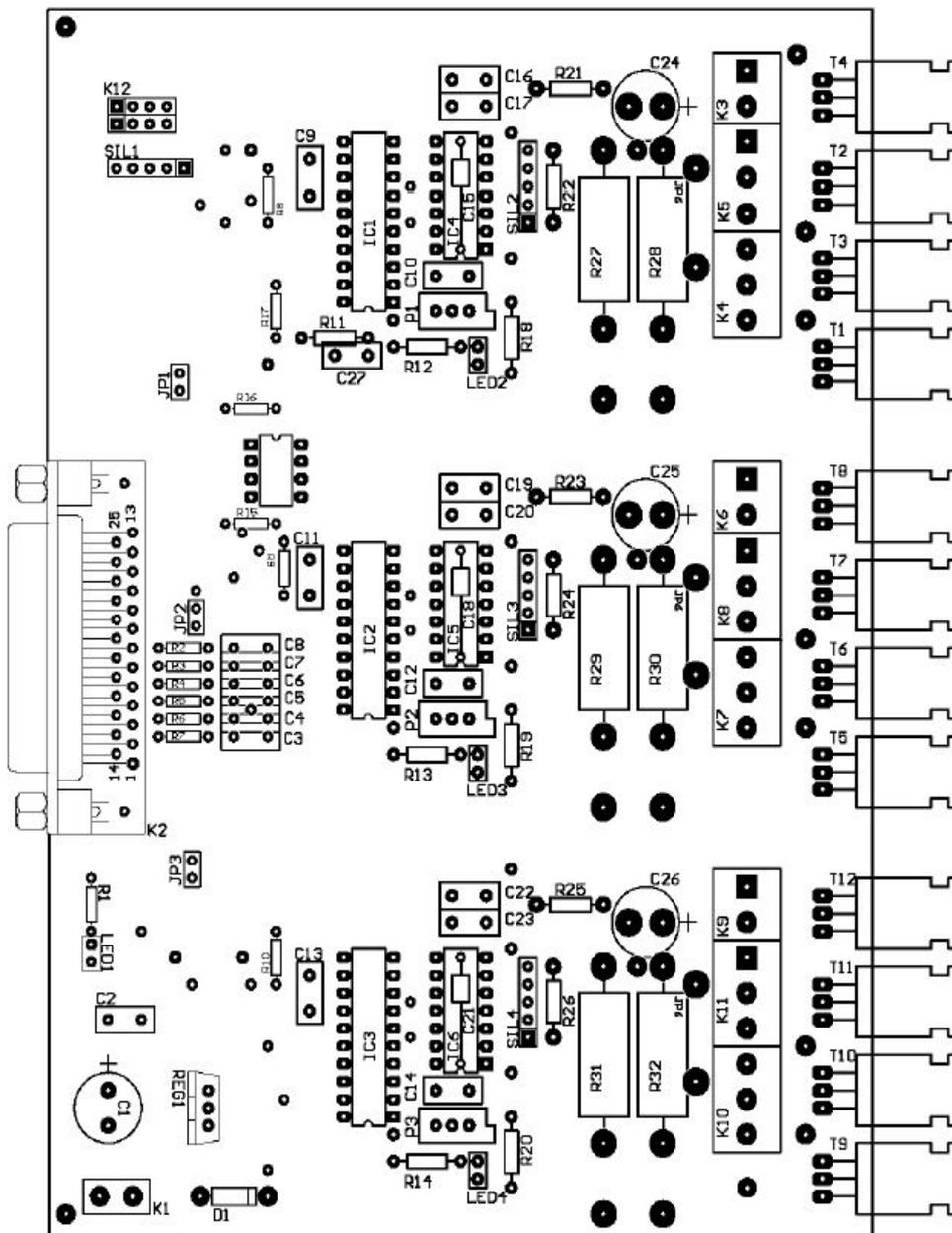
Power supply for motors: 5-30V/max.3A for motor (*External*).

Home position

Limit position

Emergency button

Power supply: 12V/1A.



K2 – PC LPT port

| Pin | Name | Dir | Description | CNC4HK |
|-----|---------|-----|---------------|----------------|
| 1 | /STROBE | → | Strobe | Enable motor Z |
| 2 | D0 | → | Data Bit 0 | Step X |
| 3 | D1 | → | Data Bit 1 | Dir X |
| 4 | D2 | → | Data Bit 2 | Step Y |
| 5 | D3 | → | Data Bit 3 | Dir Y |
| 6 | D4 | → | Data Bit 4 | Step Z |
| 7 | D5 | → | Data Bit 5 | Dir Z |
| 8 | D6 | → | Data Bit 6 | ----- |
| 9 | D7 | → | Data Bit 7 | ----- |
| 10 | /ACK | ← | Acknowledge | ----- |
| 11 | BUSY | ← | Busy | Home Z |
| 12 | PE | ← | Paper End | Home Y |
| 13 | SEL | ← | Select | Home X |
| 14 | /AUTOFD | → | Auto feed | Enable motor Y |
| 15 | /ERROR | ← | Error | E-Stop |
| 16 | /INIT | → | Initialize | Enable motor X |
| 17 | /SELIN | → | Select In | ----- |
| 18 | GND | — | Signal Ground | GND |
| 19 | GND | — | Signal Ground | GND |
| 20 | GND | — | Signal Ground | GND |
| 21 | GND | — | Signal Ground | GND |
| 22 | GND | — | Signal Ground | GND |
| 23 | GND | — | Signal Ground | GND |
| 24 | GND | — | Signal Ground | GND |
| 25 | GND | — | Signal Ground | GND |

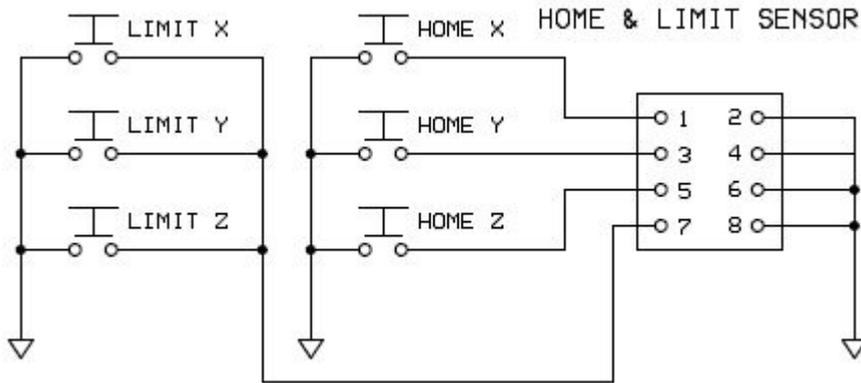
K1 – Power supply controller: 12V/1A

| | |
|---|------|
| 1 | +12V |
| 2 | GND |

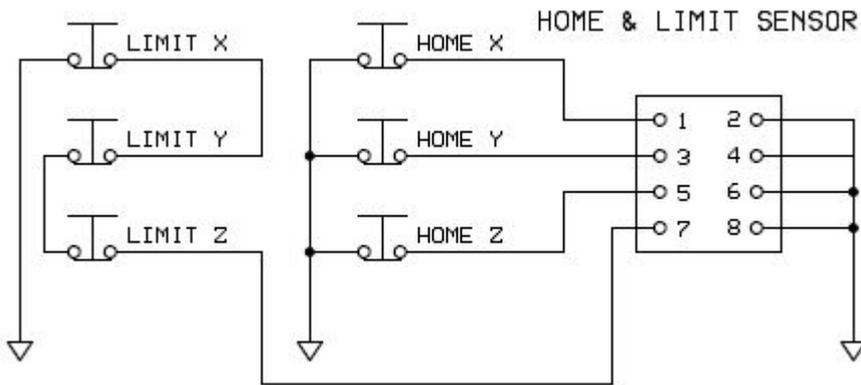
K12 – Buttons home and limir positions (E-Stop):

| | | | |
|--------|---|---|-----|
| Home X | 1 | 2 | GND |
| Home Y | 3 | 4 | GND |
| Home Z | 5 | 6 | GND |
| E-Stop | 7 | 8 | GND |

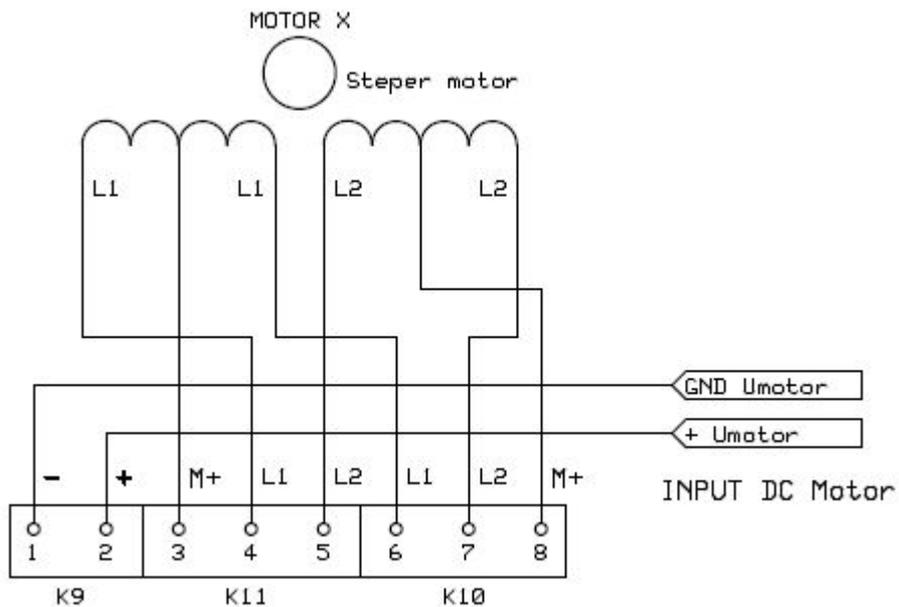
Schematic 1: Buttons normal open contacts.



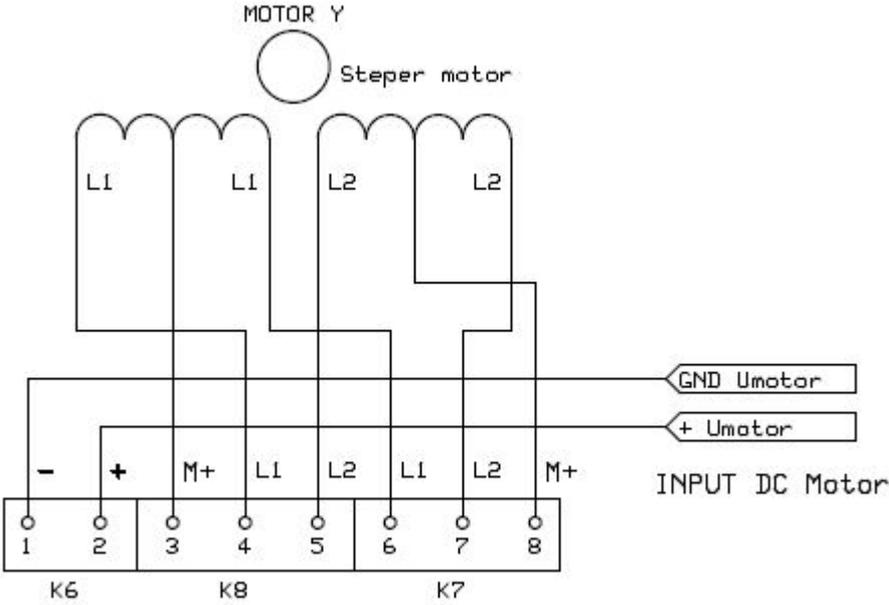
Schematics 2: Buttons normal close contacts.



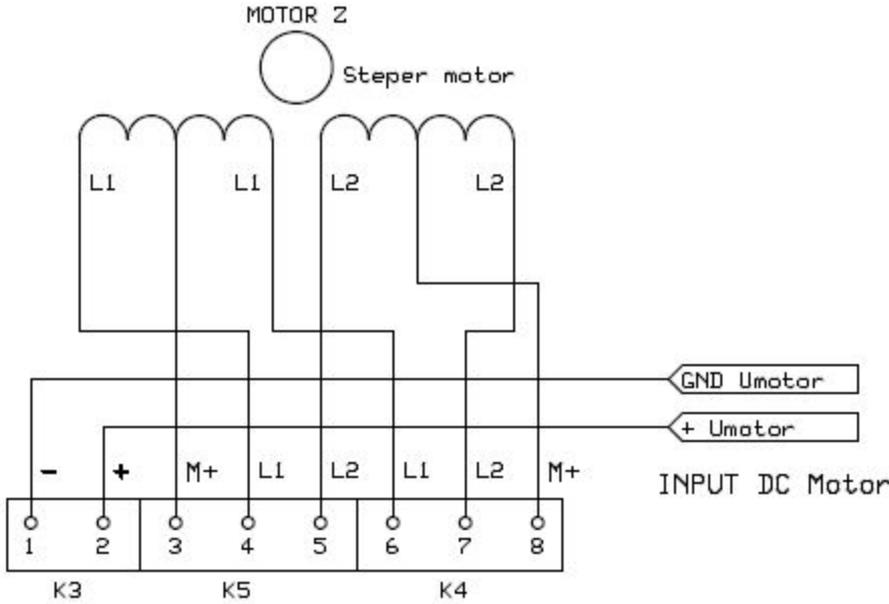
K9, K10, K11 – Motor X



K6, K7, K8 – Motor Y



K3, K4, K5 – Motor Z



- J1 – Enable control Z
- J2 – Enable control Y
- J3 – Enable control X

P1, P2 and P3 – Current control.

Calculating the step of the motor per 1mm:

Example 1:

Stepper motor: 5V/1A/step 1,8 degrees.

1 rev of the stepper motor - 360 degrees / 1,8 degrees = 200 steps when choosing FULL and 400 steps when choosing HALF.

At a 8 mm screw with step of the thread 1,25 mm, 1 rev of the screw = 1,25 mm move

Number of the steps per 1 mm - 200 steps / 1,25 mm = 160, or **160 steps = 1 mm, at FULL and 320 steps at HALF.**

1 step = 0,00625 mm at FULL.

Example 2:

Stepper motor 5V/1A/step 3,6 degrees.

1 rev of the stepper motor - 360 degrees / 3,6 degrees = 100 steps when choosing FULL and 200 steps when choosing HALF.

At a 8 mm screw with step of the thread 1,25 mm, 1 rev of the screw = 1,25 mm move

Number of the steps per 1 mm - 100 steps / 1,25 mm = 80, or **80 стъпки = 1 mm, at FULL and 160 steps at HALF.**

1 step = 0,0125 mm at FULL.

Kralev i sin Corp.

Office: Bulgaria Plovdiv str. "N. Bozveli" 11a

MIG - GG Corp.

Office: Bulgaria Bourgas str. "K. Fotinov" 36

Address of correspondence: Bulgaria Bourgas 8011 P.O.Box 27

fax: +359 56 557 006

GSM: +359 89 9984 300

GSM: +359 88 7704 725

GSM: +359 88 8809 808

GSM: +359 89 9984 310

e-mail: kmel@dir.bg

e-mail: pkralev@abv.bg

<http://www.kmel.dir.bg>