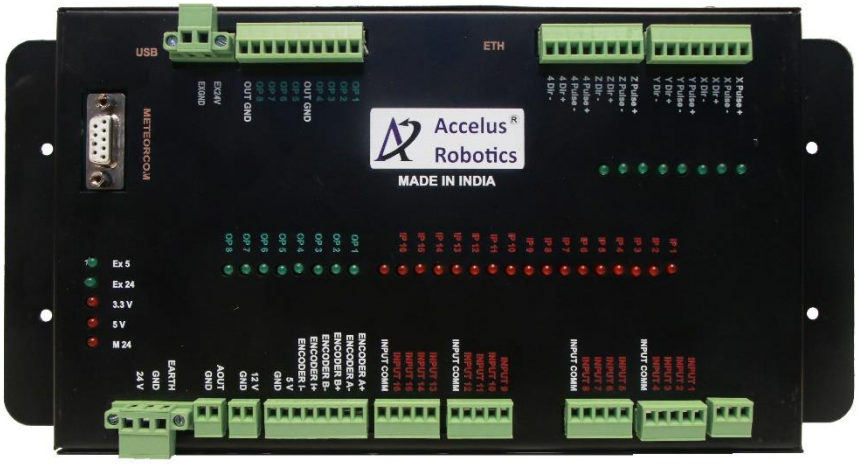
MeteorCNC - Made In India

User Manual v1.7



Index

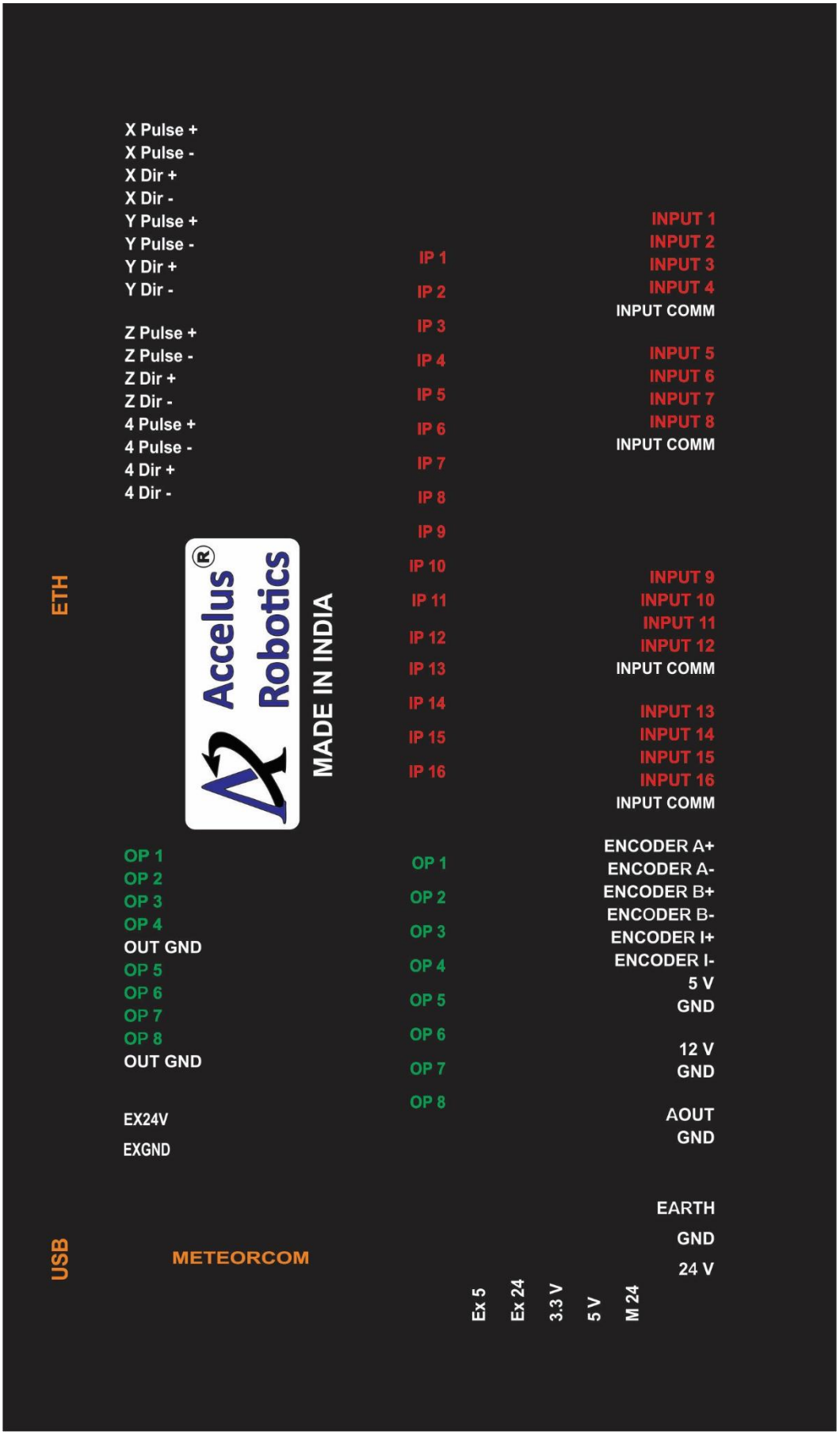
Ch 1 : Introduction

MeteorCNC providing upto four axis (X,Y,Z & 4th) upto 550khz Differential Pulse & Direction Outputs for smooth motion. With 16 digital inputs & 8 digital outputs, one analog output(0-10v) signal for spindle speed control & one optically isolated quadrature encoder input with index.

Facilities like USB pendrive for interface for easy file loading with internal storage capacity of 1GB of user files.
Network Connection available for file copying over network PC & providing remote support.

Provided handheld with easy to use interface for operation handling.

Ch 2 : Wiring Details



2.1 Inputs

MeteorCNC provides total **16 Isolated Inputs**. User can use either **NPN or PNP** signal inputs as shown in Fig.2.1.1. IP1 to IP16 are Input led indicators.

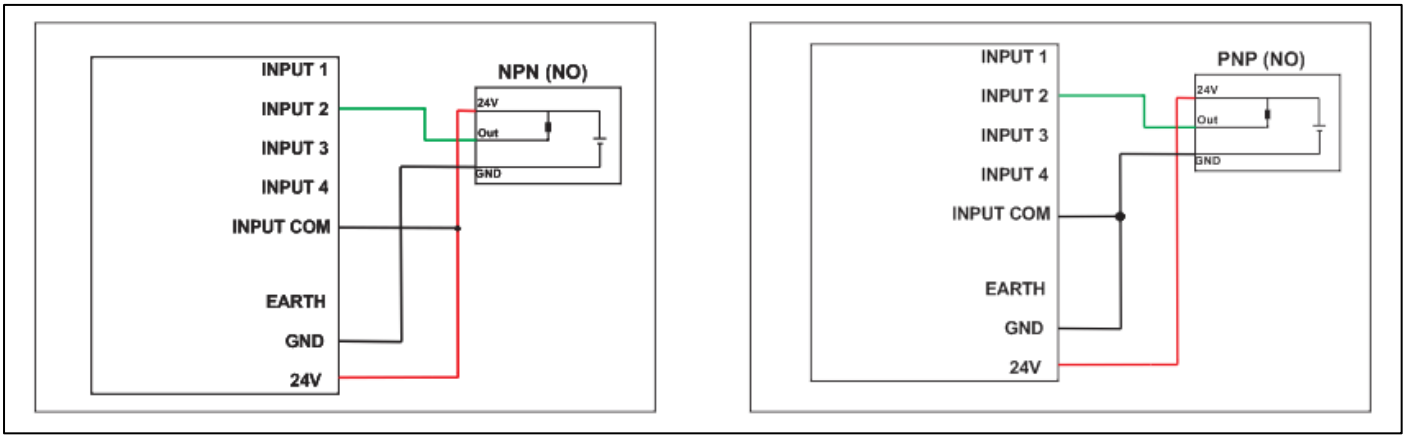


Fig. 2.1.1

Details of Inputs are given below.

Input No.	Function
INPUT 1	E-Stop
INPUT 2	X-axis Home Input
INPUT 3	Y-axis Home Input
INPUT 4	Z-axis Home Input
INPUT 5	4^{th} -axis Home Input
INPUT 6	X-axis Drive Error Input
INPUT 7	Y-axis Drive Error Input
INPUT 8	Z-axis Drive Error Input
INPUT 9	4^{th} -axis Drive Error Input
INPUT 10	X-Limit +
INPUT 11	X-Limit -
INPUT 12	Y-Limit +
INPUT 13	Y-Limit -
INPUT 14	Z-Limit +
INPUT 15	Z-Limit -
INPUT 16	Cycle Start Input

2.2 Outputs

MeteorCNC provides total **8 isolated outputs**. Each output provide up to 2A current & 24v out as shown in Fig 2.2.2.Op1 to Op8 are Output led indicators.

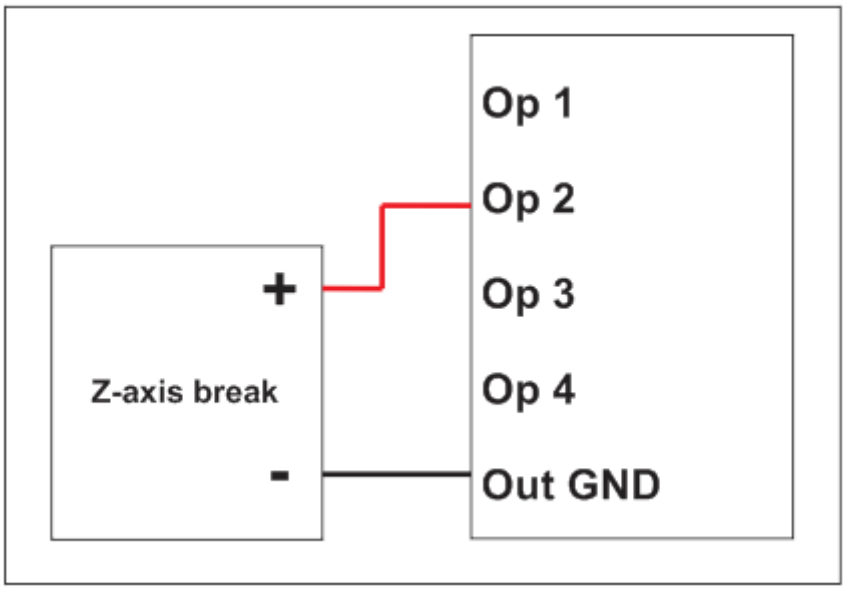


Fig 2.2.2

Details of Outputs are given below.

Output No.	Function
Op1	Machine Lamp On
Op2	Z-Axis Break
Op3	Spindle ON
Op4	Mist
Op5	Lubrication
Op6	Multi-Step 1
Op7	Multi-Step 2
Op8	Multi-Step 3

Note : 1. EX24 & EXGND must connect to turn On outputs
2. MeteorCNC will produce out 24v from outputs

2.3 Analog Output

MeteorCNC provides one analog output which vary from **0-10v**.This analog output will help to run the spindle with on set frequency. To trigger VFD MeteorCNC have dedicated output as **Op3** as shown in Fig.2.3.1

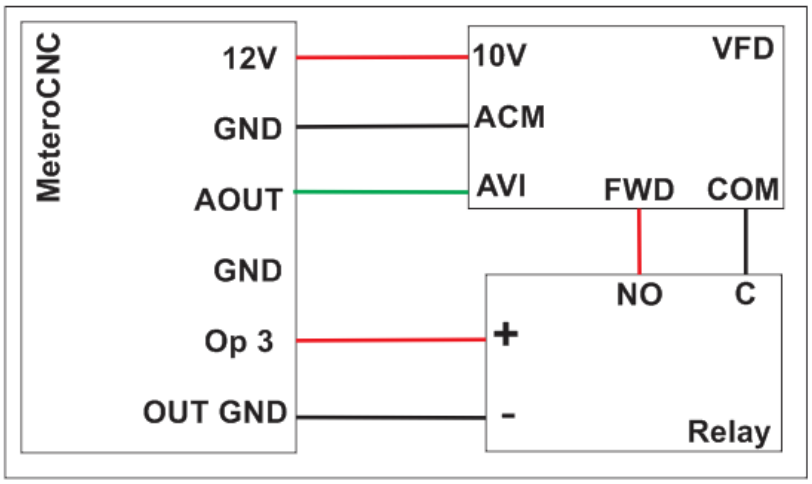


Fig.2.3.1

2.4.Differential Pulse & Direction Outputs

MeteorCNC provides total 4 differential pulse & direction outputs with 500khz jitter free pulsing for smooth motion.

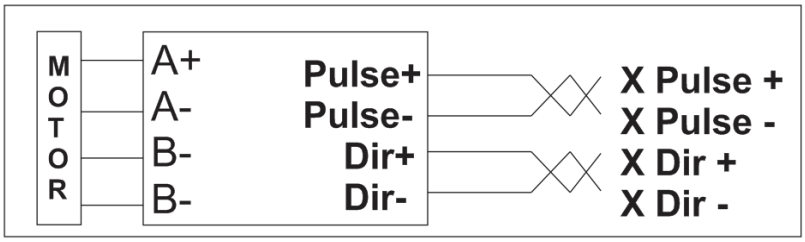


Fig.2.4.1

Note : It is recommended to use shielded twisted pair cable for reduce noise & pulse missed issues which occur at Drive's end.

2.5. Isolated Quadrature Encoder input with index

MeteorCNC provides quadrature encoder with index input.User can use MPG(manual pulse generator) or any other type of encoder according to application. 5v are coming out from MeteorCNC which can be use as supply voltage for encoder.

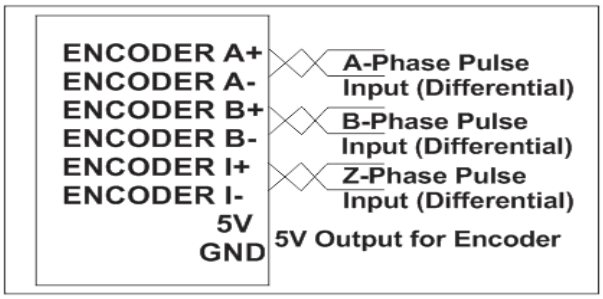


Fig.2.5.1

Note : It is recommended to use shielded twisted pair cable for reduce noise & pulse missed issues which occur at Drive's end.

2.6. Supply Voltage

MeteorCNC require 24v dc to start its operation. Please provide supply to both the side of controller.

EX5 & EX24 led indicates external 5v & 24v working. 3.3v, 5v & M24 indicates 3.3v,5v & 24v working.

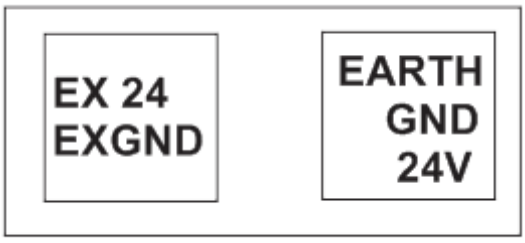


Fig.2.6.1

Note : EX24 & EXGND must connect to Turn On outputs & run motors.

2.7. MeteorCOM

Connect the hand handle to MeteorCOM to perform the operations.

Ch 3 : Menu System

MeteorCNC provides below menu in its systems.

1. MeteorCNC
2. Operations
3. Breakpoint Restore (Breakpoint Rstr)
4. Job Setup
5. Machine Setup
6. Diagnosis
7. Backup / Restore

1. MeteorCNC

Machine status is shown in this.

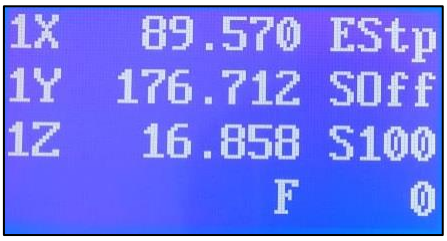
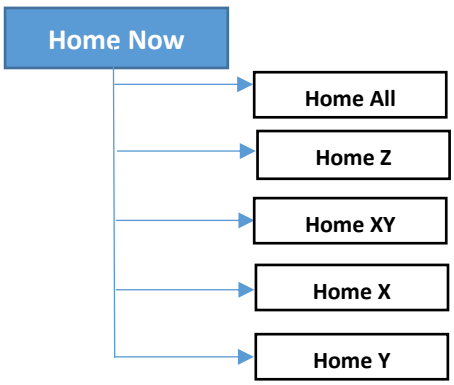


Fig.3.1.1

2. Operations

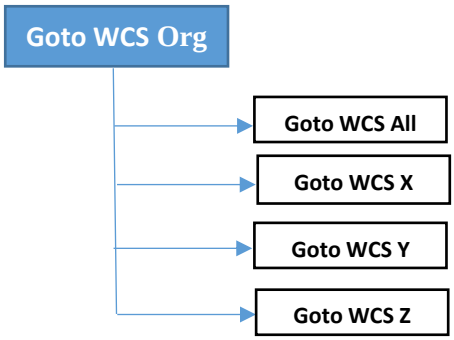


Home All: Do homing of all axis based on Home Seq.
Home Z: Do homing of Z Axis Only.
Home XY: Do homing of X & Y Simultaneously.
Home X: Do homing of X axis only.
Home Y: Do homing of Y axis only.

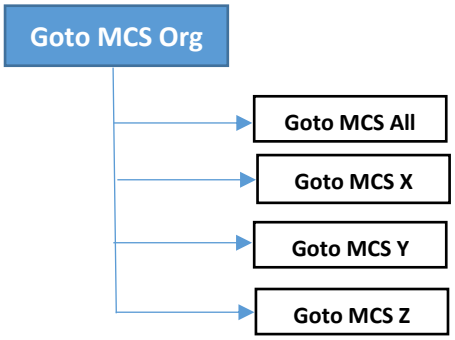
In this user can store .tap & .NGC from pen

USB Files

In this user can see the file from inserted USB pen drive. User can copy .NGC or .Tap file from pen drive & paste it in internal memory of controller.



Goto WCS All : This will send X,Y & Z axis to origin of WCS.
Goto WCS X: This will send X axis to origin of WCS.
Goto WCS Y: This will send Y axis to origin of WCS.
Goto WCS Z: This will send Z axis to origin of WCS.



Goto MCS All : This will send X,Y & Z axis to origin of MCS.
Goto MCS X: This will send X axis to origin of MCS.
Goto MCS Y: This will send Y axis to origin of MCS.
Goto MCS Z: This will send Z axis to origin of MCS.

Tool Select

There are total 50(Tool_0 to Tool_49) tools can be set in the configuration for machine operation. The operation will allow the tool change operation manually.

Select WCS

User Can Select total 9 WCS from G54 to G59.3

3. Breakpt Rstr (Breakpoint Restore)

This functionality used to saved line number & axis position when power goes off. MeteorCNC will store the data in following conditions

- During power failure in between running the program.
- User stop the design with stop button from hand handle or By pressing Emergency Stop.

Shortcut keys to go to this **SHIFT + ENTER**.

4. Job Setup

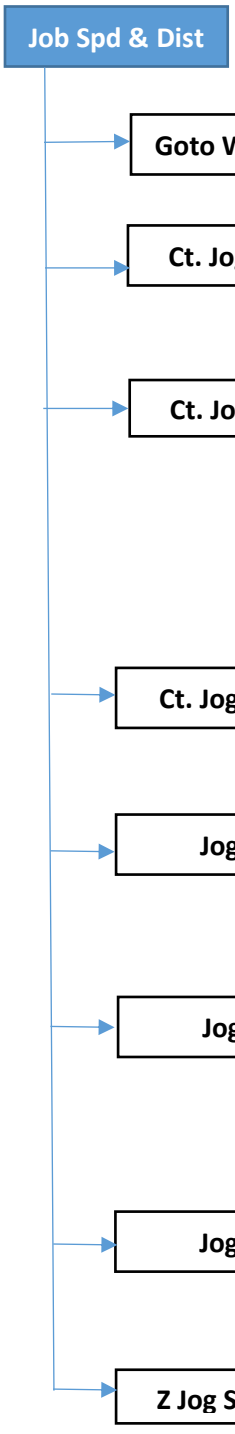
Z Safe Height — User will send Z-axis to safe position by pressing Z=0 or XY=0. In XY=0, Z-axis will move first & go to its defined Z safe height.

Park Position

- **Park On/Off** — By turning ON the function, Machine will go to defined Parked position after design finished.
- **X Position** — User will defined X-axis parked position after design finished.
- **Y Position** — User will defined X-axis parked position after design finished.
- **Z Position** — User will defined X-axis parked position after design finished.

Shift Offset

- **X Work Shift** — This will shift X axis work offset & its unit is in mm.
- **Y Work Shift** — This will shift Y axis work offset & its unit is in mm.
- **Z Work Shift** — This will shift Z axis work offset & its unit is in mm.



User will defined the goto WCS speed.

User will defined the continuous High Jog speed. User can change the mode by pressing **Jog Spd button (number 5).**

User will defined the continuous Medium Jog speed. User can change the mode by pressing **Jog Spd button (number 5).**

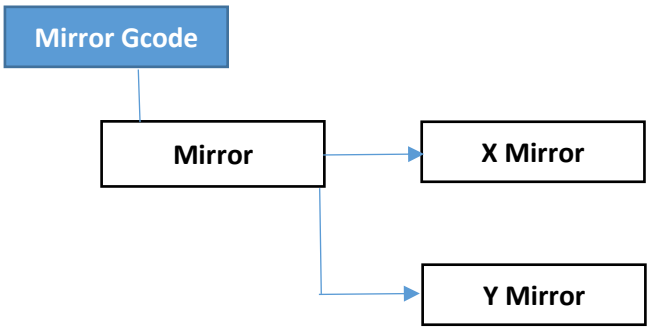
User will defined the continuous Low Jog speed. User can change the mode by pressing **Jog Spd button (number 5).**

User will defined the Steps & its speed in Jog1 mode. User can change the mode by pressing **Jog Spd button (number 5).**

User will defined the Steps & its speed in Jog2 mode. User can change the mode by pressing **Jog Spd button (number 5).**

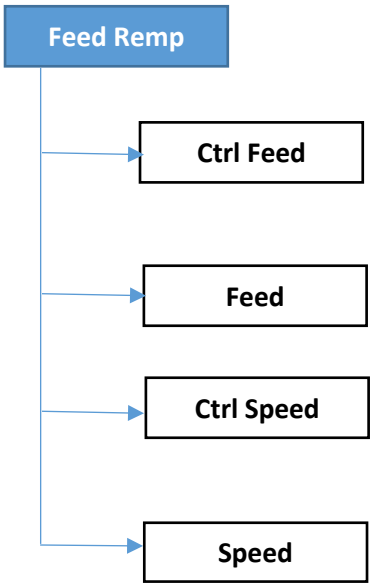
User will defined the Steps & its speed in Jog3 mode. User can change the mode by pressing **Jog Spd button (number 5).**

User can defined Z Jog Speed in %.



This will flip X-side Gcode.

This will flip Y-side Gcode.

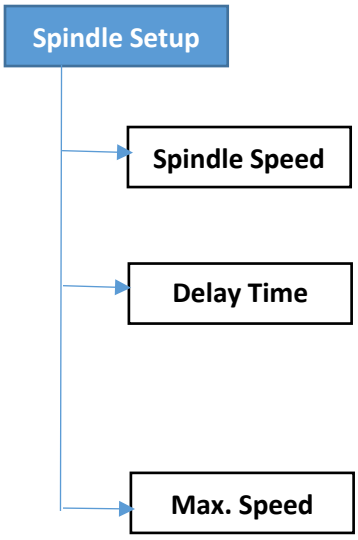


Turn this ON to bypass the program feed.
Feed value taken as per the setting.

This value will be used as feed if Ctrl feed feature is ON.

Turn this ON to bypass the program Spindle Speed.
Spindle Speed taken as per the setting.

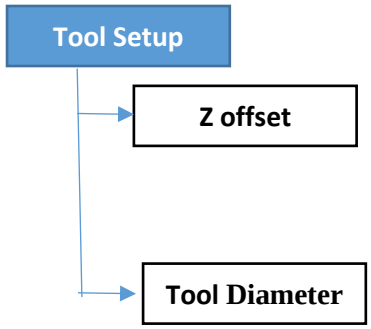
This value will be used as Spindle Speed if Ctrl Speed feature is ON.



User can use this speed when it operates spindle manually by **Spindle ON** button.

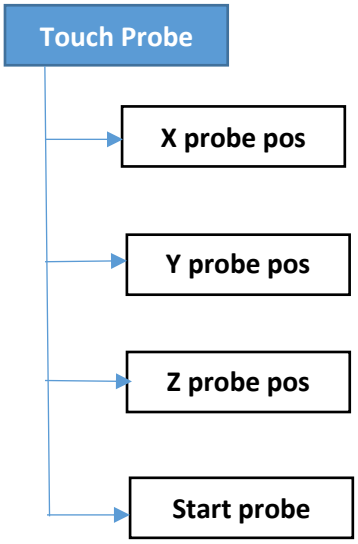
This delay is used when spindle starts with M3 command. Program will halt for defined time before executing further command.

This is the max RPM at which spindle will run.



Set the tool length offset for 50 tools for the machine configuration. This will be used when tool compensation will be applied by G43.

Set the tool diameter for 50 tools for the machine configuration.



User can defined X-axis probe position.

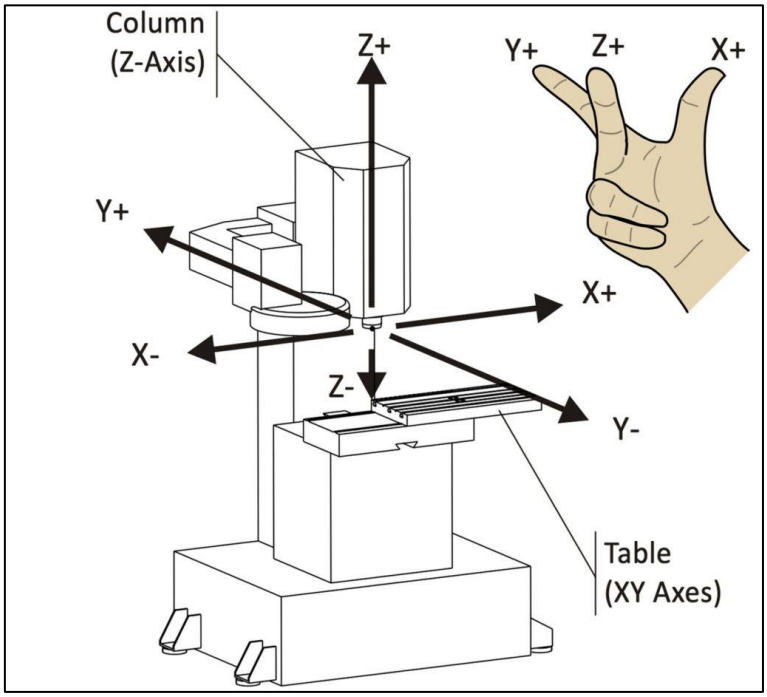
User can defined Y-axis probe position.

User can defined Z-axis probe position.

User can enable the probe function by turning ON this option.

5. Machine Setup

An Easy way to understand the Co-ordinate system in relation to CNC is using Right Hand Rule(RHR).
RHR : Hold your hand out palm up with your thumb & index finger pointed outwards & your middle finger pointed upwards. Place your hand in front of CNC machine, aligned with the machine's spindle & you will see the axes line up perfectly.



When user enter in this menu, system will ask Password for further access. User can ask the password to manufacturer or distributer or support service.

Axis Setup

X-axis

1. **Pulse / mm** : This is scaling factor of number of pulses to be generated by the MeteorCNC to move axis by 1mm. please refer below examples for better understanding.

Eg.1 : Drive PPR : 4000 & Ball screw pitch : 5 mm
Pulse/mm (scale) = Drive PPR / Ball screw pitch = 4000/5 = 800

Eg.2 : Drive PPR : 4000 & Pinion Dia : 10
Pulse / mm (scale) = Drive PPR / (pi*pinion dia) = 4000 / (3.14*10)
=127.3888
Consider gear box of 10 is connected after above mechanism than formula will be
Pulse / mm (scale) = [Drive PPR / (pi*pinion dia)] * gear box
= [4000/3.14*10] * 10
= 1273.88

Eg.3 : Drive PPR : 4000 & 1:4 ratio given of axis
Pulse/mm (scale) = Drive PPR * ratio = 4000 * (1/4) = 1000

2. **Backlash :** Backlash compensation value cab be used to make up for small deficiencies in the hardware used to drive an axis.

3. **Pos Soft Limit :** The maximum positive soft limit for axis motion, when this limit is exceeded the controller aborted the operation.

4. **Neg Soft Limit :** The maximum negative soft limit for axis motion, when this limit is exceeded the controller aborted the operation.

5. **Max Acc :** Maximum acceleration for this axis is machine per unit second squared.

6. **Max Spd :** Maximum velocity for this axis in machine unit per second.for better understanding refer the example

   Eg.1 : Motor Max speed : 3000 RPM = 3000/60 = 50rps
   Pitch : 20
   Max spd (axis) = (3000/60) * 20 = 1000 rps

7. **Homing Spd :** Initial homing velocity in machine per unit second. sign denotes the direction of travel. A value **'0'** means assume that the current location is home position for the machine.

8. **Home Sense Spd :** Homing velocity in machine unit per second to the home switch latch position. sign denotes the direction of travel.

9. **Homing Sequence :** This function is used to defined "Home All" sequence.starts at 0 & no number may be skipped.if left out or set to -1 the joint will not be homed by "Home All " function.More than one axis can be homed at the same time.

Note : Above all settings are same for other three axes also

Speed Setup

1. **Max Feed Override :** The maximum feed override the user may select. 1.2 means 120% of the programmed feed rate.

2. **Max Spindle Override :** The maximum spindle override the user may select. 1.0 means 100% of the programmed spindle speed.

3. **Min Spindle Override :** The minimum spindle override the user may select. 0.5 means 50% of the programmed spindle speed.

   Note : This is useful as it's dangerous to run a program with a too low spindle speed.

StartUp Home User can enable this feature which will ask "Homing Permission" on the start of the controller.

Lubrication

1. On Delay : This will keep Lubrication ON for specified time in seconds during cycle run.
2. Off Delay : This will keep Lubrication OFF for specified time in seconds during cycle run.

Change password User can change the machine setup password if he knows the old password.

6. Diagnosis

Version Shows the current program version which is running in MeteorCNC.

Keypad Check This is used diagnosis the handle's keys are properly working or not.

Machine State This is used to check the controller's status like E-stop, Machine Status , Current WCS, Tool offset, Tool number etc.

G52 Offset G52 offset of X,Y and Z axis for selected WCS.

G92 Offset G92 offset of X,Y and Z axis.

G43 Offset Length offset of X,Y and Z axis.

Axes Freq It will show the frequency of X,Y,Z & A axis.

Running Error Error history of any error that might have occurred during any operations. Upto 15 error history can be display.

Disk Space This will show the total space in the controller. User can store file up to 500MB.

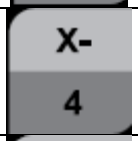
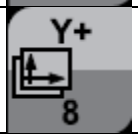
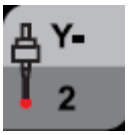
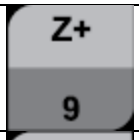
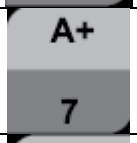
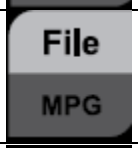
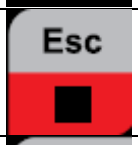
Clear Log This will clear error log of the controller.

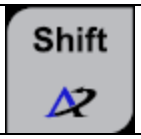
Inputs Displays status of all 16 inputs. It will display ON/OFF based on inputs signal is present or not. If any input is present then respective LED in red colour will turn ON.

Outputs Force the any outputs to On/OFF for checking the outputs manually. When any output is turned On then respective LED in green colour will turn On.

Unlock Cycles After finishing trial cycles Controller will ask for Unlock cycle key. User need to call manufacturer or dealer for this key.

Ch 4 : KeyPad Details

Key Icon	Key Name	Function
	X+ / number input 6	X-axis positive jog;Input number of 6. **Shift + key 6 shortcut for Mirror Code**
	X- / number input 4	X-axis negative jog;Input number of 4.
	Y+ / number input 8	Y-axis positive jog;Input number of 8.
	Y- / number input 2 / Touch Probe for tool	Y-axis negative jog;Input number of 2. Shift + key 2 is short cut for Touch probe functionality for tools **Shift + key2 shortcut for Touch Probe**
	Z+ / number input 9	Z-axis positive jog;Input number of 9.
	Z- / number input 3	Z-axis negative jog;Input number of 3.
	A+ / number input 7	A-axis positive jog; Input number of 7.
	A- / number input 1	A-axis negative jog; Input number of 1.
	Menu / Error Screen	Entering into the Menu OR Shift + Err Scr is shortcut key to goto Error screen.
	File / MPG operation.	Internal memory files to select program stored **Shift + file shortcut for MPG jogging operation**
	Pause/Resume	To Pause the processing ; And Resume key to resume where the processing stop. **Resume for resume from Pause state.**
	Stop/Esc	To stop processing ; Esc key to cancellation of selection and get out of menu.
	Start/Enter	To start processing ; Enter key to enter inside the menu **Shift + Enter shortcut for BreakPt Rstr operation**

	Spindle on/Spindle Off	Manually turn On /Off spindle;
	Goto position X=0,Y=0,A=0 / Set position X=0 Y=0 A=0 / number input 0;	Go to Position Origin of WCS for X,Y,A axis; Shift + XYA=0 to set Origin of WCS in selected coordinate system for X,Y,A axis. Input number of 0. **Shift + XYA=0 shortcut for X,Y,A axis set zero**
	Goto Position Z=0 / set position Z=0 / number input dot(.) / or Number input minus(-) with Shift key	To set the origin of WCS in Z axis with Shift key Or Goto Z safe height of WCS or number input dot(.)for decimal point. or number minus(-) for negative number entry. **Shift + Z=0 shortcut for Z axis set zero**
	Spindle override Decr	Spindle override value decrement. Left Arrow key.
	Spindle override Incr OR SO 100	Spindle Override increment OR Set the Spindle override To 100 with shift key; Right arrow key.
	Feedrate override Incr OR FO 100	Feedrate override increment OR Set Feed override to 100 with Shift key; Up arrow key for meny browsing and file
	Feedrate override Decr	Feed override value decrement; Down arrow Key for Menu browsing **Shift + Down is shortcut for toggle between Feed percent and Feed Actual programmed.**
	Shift	Auxiliary key
	Jogging speed / number input 5 / Homing Shortcut	To set the Jog speed JogH,JogM,JogL,Jog1,Jog2,Jog3; Input number of 5. **Shift + Jog Spd shortcut for Homing operation.**