

## *iMach<sup>III</sup> P2 and P2-E CNC Control Pendant*



## **PREFACE**

Any machine tool, including computer controlled machine tool, is potentially dangerous. VistaCNC LLC accepts no responsibility for any damage or injury caused by its use. It is your responsibility to insure that you understand the machine you are using and the procedures for safety operations.

If you are in any doubt you must seek guidance from a professionally qualified expert rather than risk injury to yourself or to others.

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## **WARNING**

E-STOP switch button in iMach<sup>III</sup> P2 CNC Control Pendant only provides Emergency STOP signal to Mach3 CNC application.

For further protection in CNC operation, other emergency protection methods may be needed.

## FEATURES

- Plug n' Play USB connection and controls.
- 100 steps high precision MPG.
- Step, Velocity and Continuous mode jogging through MPG.
- Feed rate, Spindle speed, and Slow Jog rate change through MPG.
- Quick step size selection.
- Program Start, Stop, Hold, and Rewind control.
- 5 Axis selections.
- E-Stop with flash LEDs indicator.
- Extended E-STOP functions. (P2-E model).



## PLUGIN

- Download the latest iMach3-P2 v3.x Plugin from [www.vistacnc.com](http://www.vistacnc.com) download page.
- Move the plugin file into Mach3 Plugins directory.

## CONNECTION and START

- Directly plug the USB cable into any USB port on the PC.
- Start Mach3 application.
- Click Config from menu, select Config Plugins, and enable iMach3-P2-Pendant.


- Close Mach3 application and restart Mach3 application.

## FUNCTIONS and OPERATIONS

### 1. Axis selection

- Turn axis selection knob to select an axis to jog.
- When axis selection knob is in OFF position, except E-stop signal, no other signals are sent to Mach3 application.

### 2. MPG (Manual Pulse Generator) mode and control selection

- Turn mode selection knob to select MPG mode or control. Press and hold the SIDE button  to select MPG mode on the inner ring around mode selection knob.
- Single clicking the SIDE button opens or closes the TAB window.
- ❖ **Single clicking a button requires pressing and releasing the button once within 0.5 to 1 second. The action is similar to single clicking a button on Mach3 screen.**

#### 2.1 STEP, STEP / VELOCITY, SINGLE STEP mode

**2.1.1** In STEP mode, the selected axis moves 1 step at each MPG click (detent) with the step size currently in the system.

**2.1.2** In STEP / VELOCITY mode, turning MPG at higher speed changes MPG mode from STEP mode to VELOCITY mode. STEP / VELOCITY mode can be enabled or disabled in the Plugin Configuration Table.

- ❖ **Use MPG cap to turn the MPG wheel to get lower speed for STEP mode. Use MPG handle to turn the MPG wheel to get higher speed for VELOCITY mode.**

**2.1.3** Pressing and holding the side button in STEP mode temporarily changes MPG mode to SINGLE STEP Mode or VELOCITY mode, based on the selection in Plugin Configuration Table.

- ❖ **In SINGLE STEP mode, the selected axis only moves 1 step for every continuous MPG movement.**

**2.1.4** A fixed MPG feed rate can be setup in PlugIn Configuration table. This feed rate is used only when MPG moves in Step mode.



❖ ***It is recommended to use higher feed rate for smooth movement.***

**2.1.5** Quick step size selection. In Step mode, double clicking the SIDE button cyclically selects the step size based on step size setup in PlugIn Configuration table.

❖ ***Double clicking a button requires pressing and releasing the button twice within 0.5 to 1 second. The action is similar to double clicking a button on Mach3 screen.***

## 2.2 VELOCITY mode

**2.1.1** In VELOCITY mode, axis moves at 0 to 100% of maximum axis speed based on how fast the MPG wheel is turned.

**2.1.2** Speed change sensitivity in both  and  can be setup separately in PlugIn Configuration table to get different speed rate.

## 2.3 CONTINUOUS mode

**2.3.1** In C mode, axis moves at constant speed with Slow Jog Rate. The axis movement is independent to the speed at which the MPG is turned.

**2.3.2** To avoid accidentally moving MPG and axis, steps to delay the start of axis movement can be set in plugin configuration table.

## 2.4 CONTINUOUS RATE mode

**2.4.1** In C% mode, turning MPG changes the speed used in CONTINUOUS mode. The rate displays in Slow Jog Rate DRO (Digital Read Outs) on Mach3 Screen.

## 2.5 FEED RATE mode

**2.5.1** In F% mode, turning MPG changes feed rate overridden (FRO) rate from 1% to 250 %. FRO rate can be changed when axes are moving.

## 2.6 SPINDLE SPEED mode

**2.6.1** In S% mode, turning MPG changes spindle speed overridden rate from 1% to 250 %. Spindle speed can be changed when the spindle is running.

## 2.7 CYCLE START / FEED HOLD control /

Double clicking the SIDE button starts or pauses the program.

- ❖ **When program enters Cycle Start state, E-STOP LED keeps steady-on.**
- ❖ **When program enters Feed Hold state, E-STOP LED, in every second, flashes twice in the first half second and stops flashing in the next half second.**

## 2.8 STOP / REWIND control /

Double clicking the SIDE button stops or rewinds the program.

## 3. E-Stop switch button



- When the button is pressed and locked, the embedded LED flashes at ¼ second rate.
- When the button is released and Mach3 application is in Reset mode, the LED flashes at ½ second rate.

### 3.1 E-Stop switch button in P2 model

- Press E-STOP switch button to send out E-Stop signal to Mach3 application and activate Emergency Mode in Mach3 application.
- When the button is pressed, the switch is locked down. Twist the button to reset it on.

### 3.2 E-Stop switch button in P2-E model

- Press E-STOP switch button to send out E-Stop signal to Mach3 application and activate Emergency Mode in Mach3 application. The same E-stop signal is simultaneously sent out through two separate wires to control a relay or to work with other E-stop buttons.

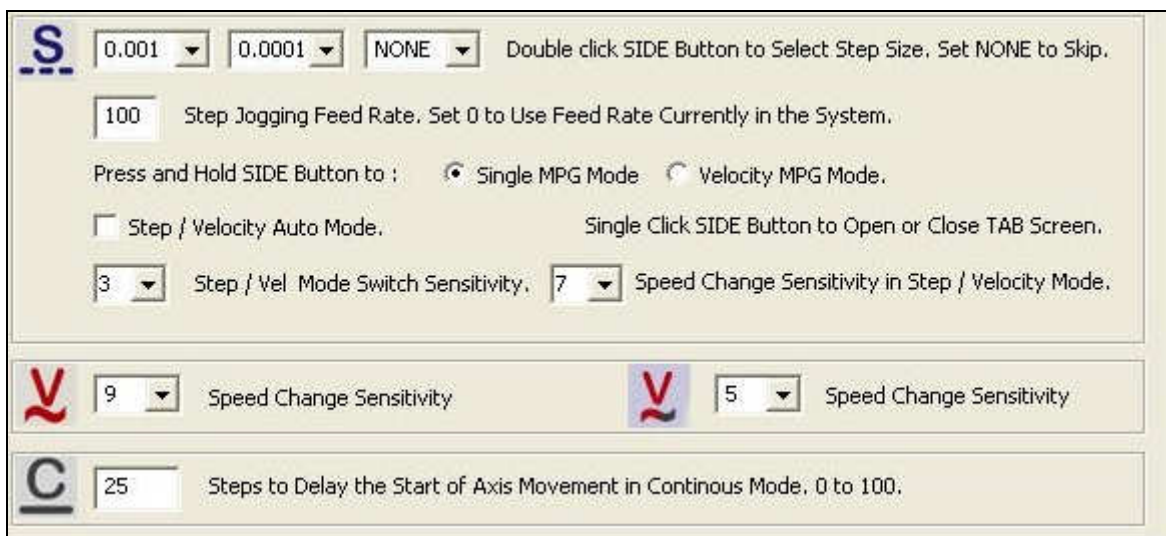
- When the button is pressed, the switch is locked down. The two wires are disconnected.
- Twist the button to reset the switch on, and the two wires are connected and form a closed loop.

### PENDANT PLUGIN CONFIGURATION

In Mach3 menu, select Config, then Config Plugins



In PlugIns menu, click CONFIG



- **Step Size Selection** sets predefined step size in each dropdown window. Select NONE to skip that window in cyclic step selection. Step size in the first window is used as the default step size.
- Number in **Step Jogging FeedRate** is the feed rate only used in MPG step jogging. When MPG wheel stops, the feed rate and FeedRate Overridden rate (FRO) automatically changes back to the number which was used before MPG moving. Set 0 to use current FeedRate and FRO rate in the system.
- See 2.1.3 for **Single MPG Mode** usage.
- Check **Step / Velocity Auto Mode** to enable STEP / VELOCITY mode. See 2.1.2 for STEP / VELOCITY mode usage.
- Single click the **SIDE** button at any MPG mode opens or closes the TAB window.
- Numbers in **Speed Change Sensitivity** is used to adjust the sensitivity of V mode. The smaller the number, the less turns are needed to reach maximum axis speed.
- **Steps to Delay Start** is used to set the number of steps to delay to start axis movement. In C mode, axis starts to move only after that many numbers of steps are turned from MPG wheel.

## SPECIFICATIONS

- Work with Mach3 R2.63 and above.
- 100 steps (clicks) per Rev MPG.
- MPG MTBF > 10000 hour.
- Shipped with 10' High Speed USB cable. Extendable to 15' with extension cable, and to 45' with USB hub cables.
- Size (over all) 6.1"(L) x 3.1"(W) X 2.7"(H)