

## *iMach<sup>III</sup> P5A and P5A-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> P5A 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.
- Easy Access E-Stop button with flash LEDs indicator.
- Step, Velocity and Continuous mode jogging through MPG.
- Feed rate, Spindle speed, and Slow Jog rate change through MPG.
- Program Cycle Start, Feed Hold and Spindle control button.
- Quick predefined step size, feed rate, spindle speed and slow jogging rate selection.
- 6 Axis selections.
- Axis zeroing control.
- 2 custom control functions.
- Extended E-STOP functions. (P5A-E model).

## PLUGIN

- Download the latest iMach3-P5A 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-P5A-Pendant.
- Close Mach3 application and restart Mach3 application.

## FUNCTIONS and OPERATIONS

### 1. Axis selection



1.1 Press X/a, Y/b or Z/c axis selection button to select an axis to jog. X axis and A axis, Y axis and B axis, or Z axis and C axis share the same button. Press the button again to select A, B or C axis. Red LED indicates X, Y or Z axis and green LED indicates A, B or C axis.

- ❖ ***A, B and C axis selection can be skipped based on the settings in PlugIn configuration table. See Pendant PlugIn Configuration section for more information.***

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



- ❖ At any time, pressing and releasing SCR button within 1 second will open or close the TAB window on Mach3 screen, and pressing and holding SCR button for more than 1 second and releasing the button will change Mach3 screens. Screen selection can be setup in PlugIn configuration table.

#### 2.1 STEP / VELOCITY, STEP SIZE mode

**2.1.1** In STEP / VELOCITY mode, turning MPG at higher speed changes MPG mode from STEP mode to VELOCITY mode. To change to STEP only mode, select 0 in S/V mode Switch Sensitivity 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.***

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

- ❖ ***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.***

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

**2.1.4** While pressing and holding the Quick Selection Button , turn MPG few steps to select the predefined step size. Selected step size displays on Mach3 Screen. Different step sizes can be set up in PlugIn Configuration table. Other step size can be set directly on Mach3 screen.

## 2.2 VELOCITY mode

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


**2.2.2** Pressing and holding the Quick Selection Button will temporarily slow down the axis movement.

- ❖ ***Speed change sensitivity and speed slow down ratio can be setup in PlugIn Configuration table.***

## 2.3 CONTINUOUS, CON'T / STEP mode


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

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

**2.3.1** Pressing and holding the Quick Selection Button  will temporarily turn CONTINUOUS mode to STEP mode. A matched feed rate as in CONTINUOUS mode will be used in STEP mode.


## 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.

**2.4.2** While pressing and holding the Quick Selection Button , turn MPG few steps to select the predefined Continuous Rate. Different Continuous Rate can be set up in PlugIn Configuration table.

## 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.

**2.5.2** While pressing and holding the Quick Selection Button , turn MPG few steps to select the predefined Feed Rate Overridden (FRO) or Feed Rate. Selection to use FRO or Feed rate, and different Feed Rate Overridden (FRO) or Feed Rate can be set up in PlugIn Configuration table.

❖ **Quick Selection is disabled when program is running or 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.

**2.6.2** While pressing and holding the Quick Selection Button , turn MPG few steps to select the predefined Spindle speed Rate Overridden (SRO) or Spindle Speed. Selection to use SRO or Spindle Speed, and different Spindle speed Rate Overridden (SRO) or Spindle Speed can be set up in PlugIn Configuration table.

❖ **Quick Selection is disabled when Spindle is on, program is running or axes are moving.**

## 2.7 FUNCTION buttons

**2.7.1** Press and release the Function Button twice (double click)  to execute predefined Mach3 OEM button, Custom Button, or Custom Macro. Operation selection can be setup in PlugIn Configuration Table. Select NONE to execute ZERO (F1) and GOTOZ (F2).

## 3. Control Operation



### 3.1 START / HOLD push button



- While pressing and holding the EN button, press and release (single click) START/HOLD button to cycle start the program if the program is not running or is in Feed Hold, or to feed hold the program if the program is running.
- When program enters Cycle Start state, 3 red LEDs in axis selection flashes one by one.
- When program enters Feed Hold state, all 3 red LEDs, in every second, flash twice in the first half second and stop flashing in the next half second.
  - ❖ **When program enters tool change state, only selected axis flashes.**



### 3.2 STOP / REWIND push button

- While pressing and holding the side button, single clicking STOP/REWIND button stops the program if the program is running, or rewinds the program if the line of the program is not zero, or stops any axis movement.

## 4. 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.

### 4.1 E-Stop switch button in P5A 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.

## 4.2 E-Stop switch button in P5A-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



The screenshot displays a configuration interface for a CNC machine. It features several control panels with rotary dials and input fields:

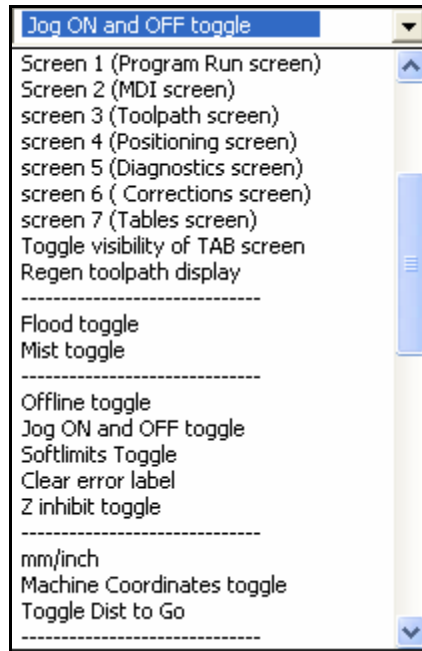
- Step Size:** A dial with values 0.1, 1, and 0.254. Below it, a text label reads "Step Size, 0 to skip".
- Feed Rate Overridden (FRO):** A dial with values 40, 50, and 60. Below it, a text label reads "Feed Rate Overridden (FRO), 0 to 250, 0 to skip".
- Feed Rate:** A dial with values 0, 0, and 0. Below it, a text label reads "Feed Rate, 0 to skip".
- Slow Jog Rate (Continuous Mode Rate):** A dial with values 10, 25, and 50. Below it, a text label reads "Slow Jog Rate (Continuous Mode Rate), 0 to 100, 0 to skip".
- Spindle speed Rate Overridden (SRO):** A dial with values 90, 100, and 0. Below it, a text label reads "Spindle speed Rate Overridden (SRO), 0 to 250, 0 to skip".
- Spindle Speed:** A dial with values 1300, 1500, and 2200. Below it, a text label reads "Spindle Speed, 0 to skip".

Below the dials, there are several configuration options:

- S:** Step Jogging FeedRate. Set 0 to Use Feedrate Currently in the System. Value: 100.
- S/V Mode Switch Sensitivity:** Select 0 for STEP only. Value: 4.
- Velocity Change Sensitivity in S/V Mode:** Value: 5.
- V:** Velocity Change Sensitivity in V Mode. Press EN Button to Slow Down to 1 / 4. Value: 3.
- C:** Steps to Delay the Start of Axis Movement in C Mode. 0 to 100. Value: 25.
- F1:** Custom OEM Button #1. Value: NONE.
- F2:** Custom Macro number 1. Value: NONE.
- Axis Selection:**
  - Include A axis in axis selection
  - Include B axis in axis selection
  - Include C axis in axis selection
  - Reverse X axis MPG
  - Reverse Y axis MPG
  - Reverse Z axis MPG
- Screen Selection:** Select NONE to Skip. Options: Screen 1 (Program Run screen), Screen 2 (MDI screen), screen 4 (Toolpath screen).

- 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.
- Numbers in **Step /Vel Mode Switch Sensitivity** is set to adjust the sensitivity of mode change from STEP to VELOCITY. The smaller the number, the less turns are needed to change to VELOCITY mode. Select 0 for STEP only mode.
- 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.
- **Velocity In's or mm's Per min.** is used to calculate feed rate used in STEP jogging in CON'T / STEP mode. The number can be copied from Mach3 -> Config -> Motor Tuning, and the number need to be refreshed each time motor turning is performed.

- **F1** or **F2** has 62 functions to select. Select NONE to execute ZERO (F1) and GOTOZ (F2).



- Custom OEM button: Input any valid Mach3 OEM button number. See Mach3 manual for complete Mach3 OEM button number list.
- Custom Macro Number: Input any Custom Macro Number. See Mach3 manual for more information about Mach3 Macro.

## 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, or to 45' with USB hub cables.
- Size (over all) 6.1"(L) x 3.1"(W) X 2.7"(H)