

iMach^{III} P1A-S 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^{III} P1A-S 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.
- LCD display with backlight.
- Large E-Stop button.
- 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.
- 4 Axis selections.

PLUGIN

- Download the latest iMach3-P1A-S Plugin from 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-P1A-S-Pendant.
- Close Mach3 application and restart Mach3 application.

FUNCTIONS and OPERATIONS

1. Axis, Step Size, Screen selection and Axis Zeroing

1.1 Axis selection

Turn axis selection knob to X, Y, Z, or A position to select an axis to jog.



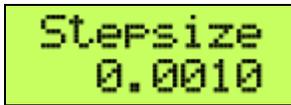
Selected axis name. It flashes at 1/2 second rate.

1.2 STEP SIZE selection

Turn mpg mode selection knob to STEP SIZE mode. Turn MPG few steps to cyclically select the step size. Different step sizes can be set up in PlugIn Configuration table.



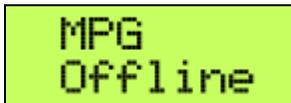
Any other step sizes can be directly set on Mach3 Screen.



1.3 Pendant Offline mode and Screen selection

Turn mode selection knob to Scr/Off  position.

1.3.1 When axis selection knob is at X, Y or Z position, the pendant is in Offline mode, and any MPG signals are not sent to Mach3 application. Offline mode can be used to align the MPG wheel to a specific number with no axis movement.



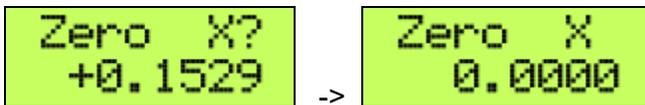
1.3.2 When axis selection knob is at F%, S% or C% position, turning MPG few steps at - direction will open or close the TAB window, and turning MPG few steps at + direction will cyclically select Mach3 Screen page. Different Screen page can be set up in PlugIn Configuration table.



- Program Run screen page. Other screen page: MDI, ToolPath, Offsets, Settings and Diagnost.

1.4 Axis zeroing

When Axis Selection knob is at X, Y, Z or A position, turn MPG few steps to zero selected axis.

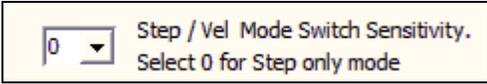


2. MPG (Manual Pulse Generator) mode

2.1 STEP / VELOCITY mode

2.1.1 In STEP / VELOCITY mode, turning MPG wheel at higher speed automatically changes MPG mode from STEP mode to VELOCITY mode.

- ❖ To set to STEP only mode, select 0 in STEP to VELOCITY mode change sensitivity in Plugin

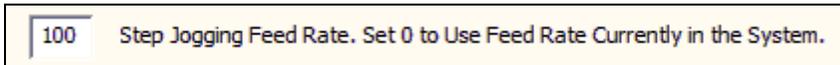
Configuration Table. 

- ❖ 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.
- ❖ STEP to VELOCITY mode change sensitivity can be set up in Plugin Configuration Table.

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

- ❖ A fixed feed rate which is only used in Step mode can be setup in Plugin Configuration table.

Set 0 to use the feed rate currently in the system.

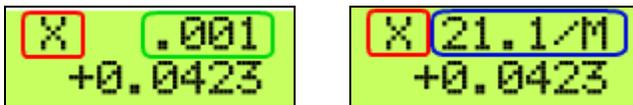


2.1.3 In VELOCITY mode, axis moves at 0 to 100% of maximum axis speed based on how fast the MPG wheel is turned.

❖ Speed change sensitivity in V mode can be set up in PlugIn Configuration table.



In STEP/VELOCITY/CONTINUOUS mode, LCD displays axis DRO readings.



Selected axis name. It flashes at ½ second rate.

Step jogging rate in units/minute, Step size. The step size and rate display changes alternately every 2 seconds

Number of decimal digits to display for axis DRO can be setup in the PlugIn Configuration Table:

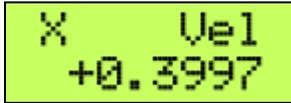


4 decimal digits

2.2 VELOCITY mode

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

❖ Speed change sensitivity in V mode can be set up in PlugIn Configuration table.



2.3 CONTINUOUS mode



In C mode, axis moves at constant speed of Slow Jog Rate . The axis movement



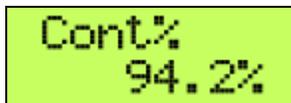
is independent to the speed at which the MPG is turned.

- ❖ *To avoid accidentally moving MPG and axis, the number of 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

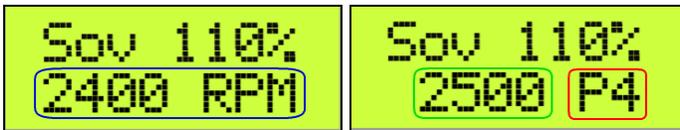
In F% mode, turning MPG changes feed rate overridden (FRO) rate from 1% to 250 %. FRO rate can be changed when axes are moving.



Feed Rate Override percentage. Feed Rate Override, Unit/Min.

2.6 SPINDLE SPEED mode S%

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



Spindle Speed RPM. Spindle Speed Override. Current pulley number.

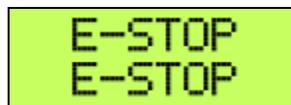
Check Display Spindle Speed RPM in Plugin Configuration Table to display Spindle RPM.

3. E-Stop switch button



5.1 E-Stop switch button in P1A-S model

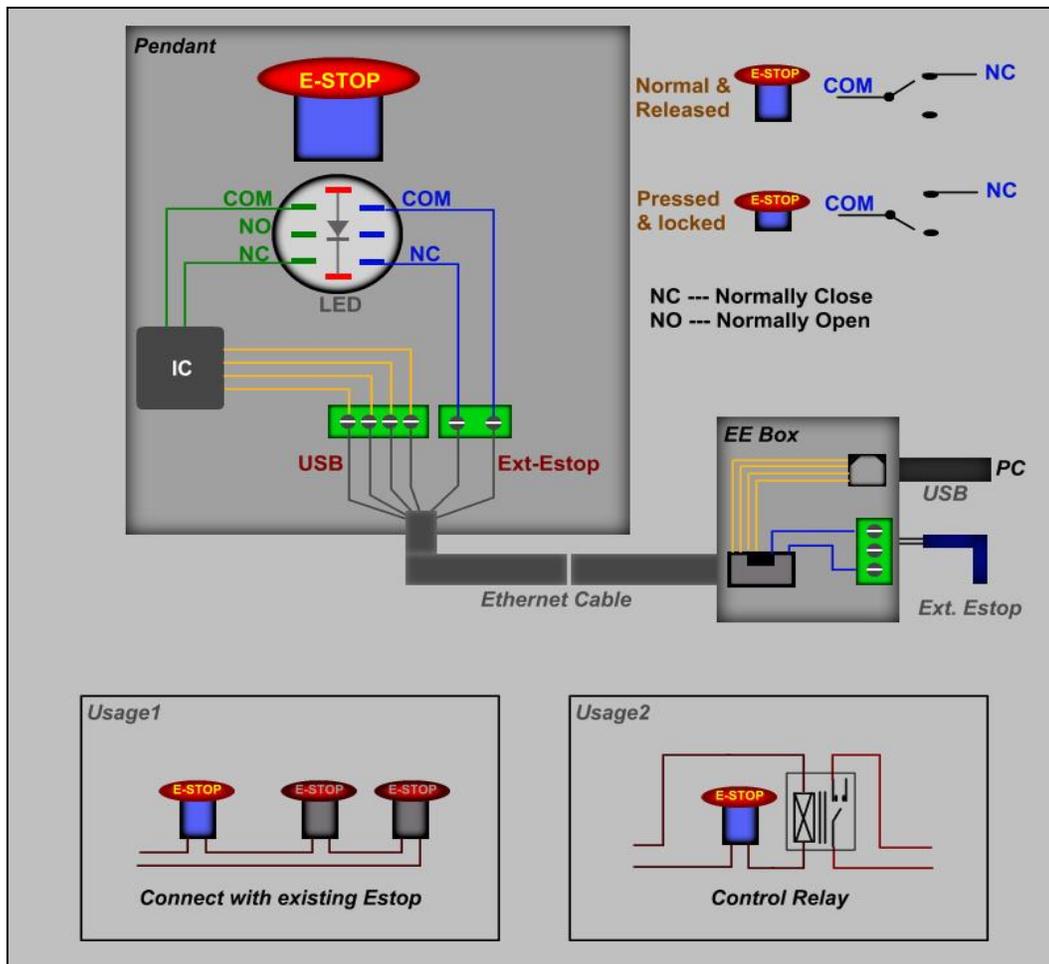
- Press E-STOP switch button to send out E-Stop signal to Mach3 application and activate Emergency Mode in Mach3.



- When the button is pressed, the switch is locked down. Twist the button to reset the button and reset E-STOP.

5.2 E-Stop switch button in P1A-SE model

- Press E-STOP switch button to send out E-Stop signal to Mach3 application and activate Emergency Mode in Mach3.
 - The same E-stop signal is simultaneously sent out through a 2-wire loop, which can be used to control a relay or to connect with other E-stop buttons.
 - When the button is pressed and the switch is locked down, the 2-wire loop is open.
 - Twist the button to reset the switch and reset E-STOP signal, and at the same time, the two wires are connected at the switch end and form a closed loop.
- ❖ A EE box is needed as an interface to separate the 2-wire loop and USB signal.



E-STOP switch and EE box connection in P1A-SE

PENDANT PLUGIN CONFIGURATION

In Mach3 menu, select Config, then Config Plugins

In Plugins menu, click CONFIG

The screenshot shows the 'CONFIG' window for a plugin in Mach3. It is divided into three sections:

- Section 1 (S):** Contains three dropdown menus for step size selection (0.001, 0.01, and NONE), a text input for 'Step Jogging Feed Rate' (0), a dropdown for 'Step / Vel Mode Switch Sensitivity' (0), and a dropdown for 'Speed Change Sensitivity in Velocity Mode' (5).
- Section 2 (C):** Contains a text input for 'Steps to Delay the Start of Axis Movement in Continuous Mode' (5).
- Section 3:** Contains a dropdown for 'Number of decimal digits for axis DRO' (3), a checked checkbox for 'Display Spindle Speed RPM', an unchecked checkbox for 'Use A Axis in C%-A Mode (v2 only)', and three dropdown menus for screen selection: 'Screen 1 (Program Run screen)', 'Screen 2 (MDI screen)', and 'screen 4 (Toolpath screen)'.

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)