VIKING

4 Axis USB MPG
Set Up Manual

www.vikingmachinery.co.nz

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0.0 Safety Statement

All machinery, especially CNC machinery, has inherent dangers and risks. It is the responsibility of the system designer to ensure that any systems built using any Viking Machinery Ltd. products are safe for use. Any technical information is provided as a reference only, and does not constitute a recommendation as to the fitness of use in any particular application.

Viking Machinery Ltd. strongly urges customers to seek expert advice when dealing with potentially dangerous electrical voltages and sources of mechanical energy. Information contained in this document does not constitute a substitute for expert advice.

1.0 Product Overview

- Controller interface: USB A Male Connector
- Maximum number of Axis': Four
- Number of step settings: Four
- Compatible with Mach3 Only

2.0 Scope of Document

This document is designed to give an overview of the set-up process for the 4 axis USB MPG product sold by Viking Machinery Ltd. This document assumes a degree of familiarity with Mach 3 and Windows.

NOTE: Please do close and re-open Mach 3 every time you are asked to in the manual. Mach 3 needs these shut downs to apply and lock in the settings that we are going to change. Failing to do so can give unpredictable behaviour and the pendant may not work as expected.

It is strongly recommended that you optimise your PC's USB power management settings for CNC use. Please see our other published documents for details on how to accomplish this.

3.0 Conenction

The MPG controller uses a custom cable to connect to the control computer.

Ensure that the cable is connected to both the pendant and the USB module as shown in the photo. The curly-cord connectors should insert snugly and ‘click’ into place.

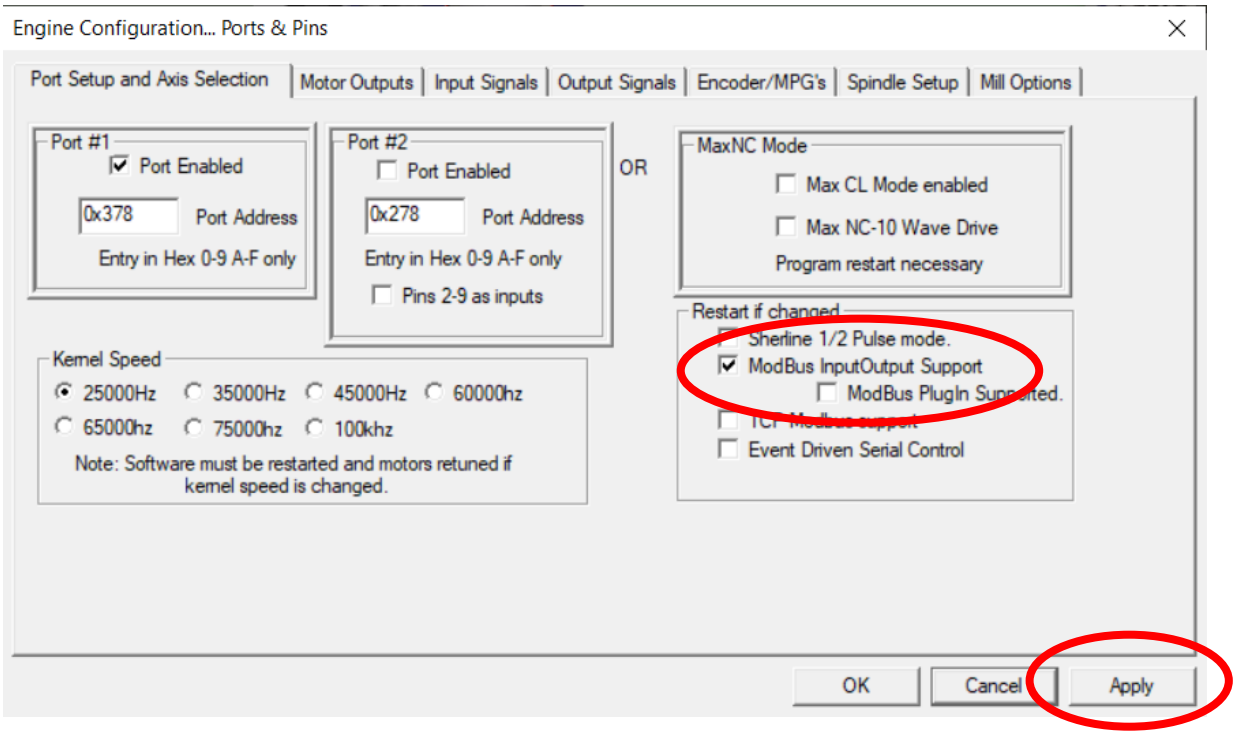
Plug the handwheel into your computers USB port and give some time for the computer to recognise the device. It will make the usual ‘new hardware’ noises at you.

The Pendant should now be flashing the SYSTEM LED as well as an LED on both the axis selection panel and the step multiplier panel. When you turn the handwheel you should see a pulsing LED under the PULSE LED.

If your computer does not recognise the device you will need to install the CH340 USB to Serial driver. This is covered in Appendix A – Installing CH340 Drivers later in this document.

4.0 Set up Mach 3 Modbus

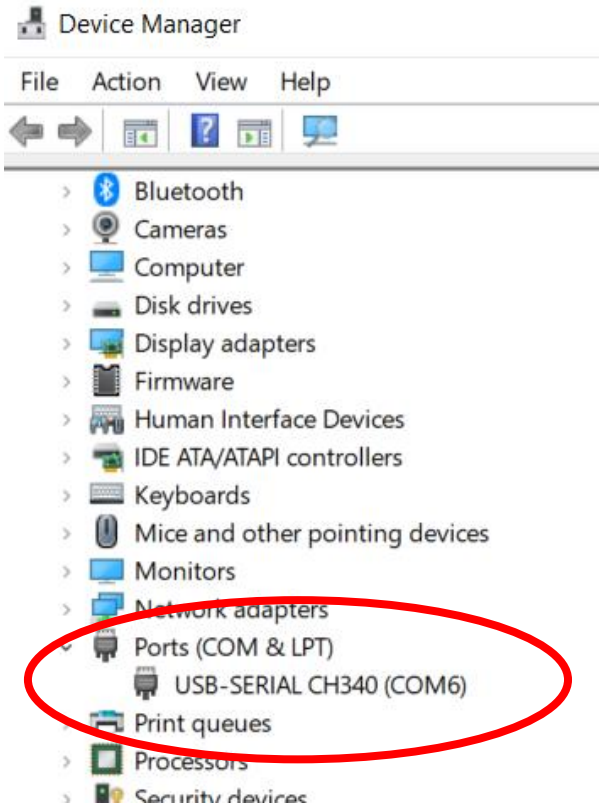
Open Mach 3, and then open “Ports & Pins” (Config > Ports and Pins). On the “Port Setup and Axis Selection” tab, check the “ModBus InputOutput Support” radio box. Click the “Apply” button to commit these changes, then click “OK” to close the window. Close Mach 3.



5.0 Find your COM Port

We need to know which COM port the device is showing under. To do this, you need to open your Device Manager in windows, and then expand the “Ports” section. You should see your device there with a COM port number listed next to it. Remember this for the next step!

If you have more than one port listed it is likely that you already have other devices already connected. Try unplugging any USB accessories until you are able to identify the COM port associated with your MPG.



6.0 Install the Macropump

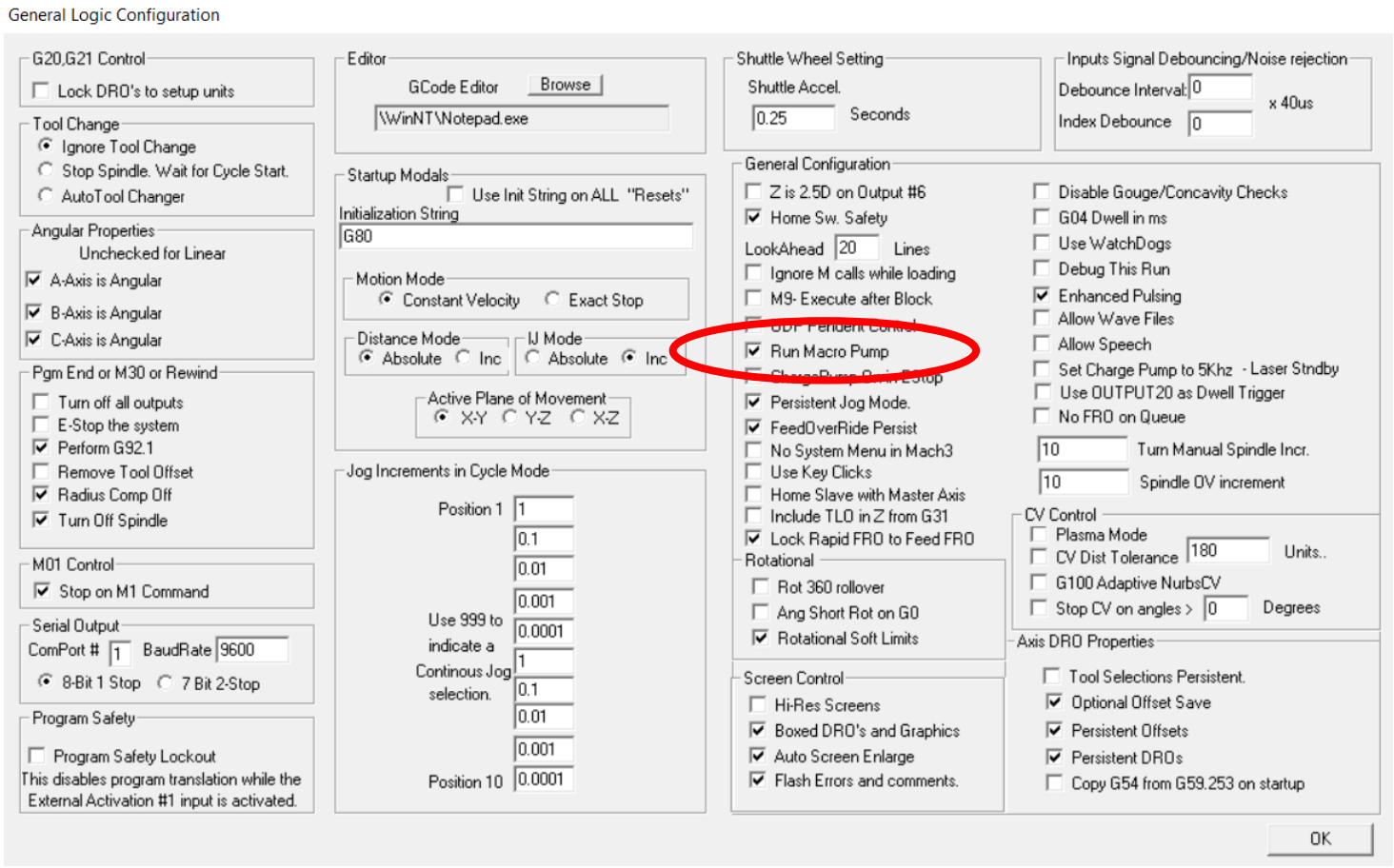
The pendant needs a Macropump to work with Mach 3. Download it from HERE and save it to your hard drive.

You now need to copy it into the Macro folder of the Mach 3 profile that you wish to work with. Usually this will be found under the following directory;

C:/Mach3/Macros/YOURPROFILENAME/Macropump.m1s

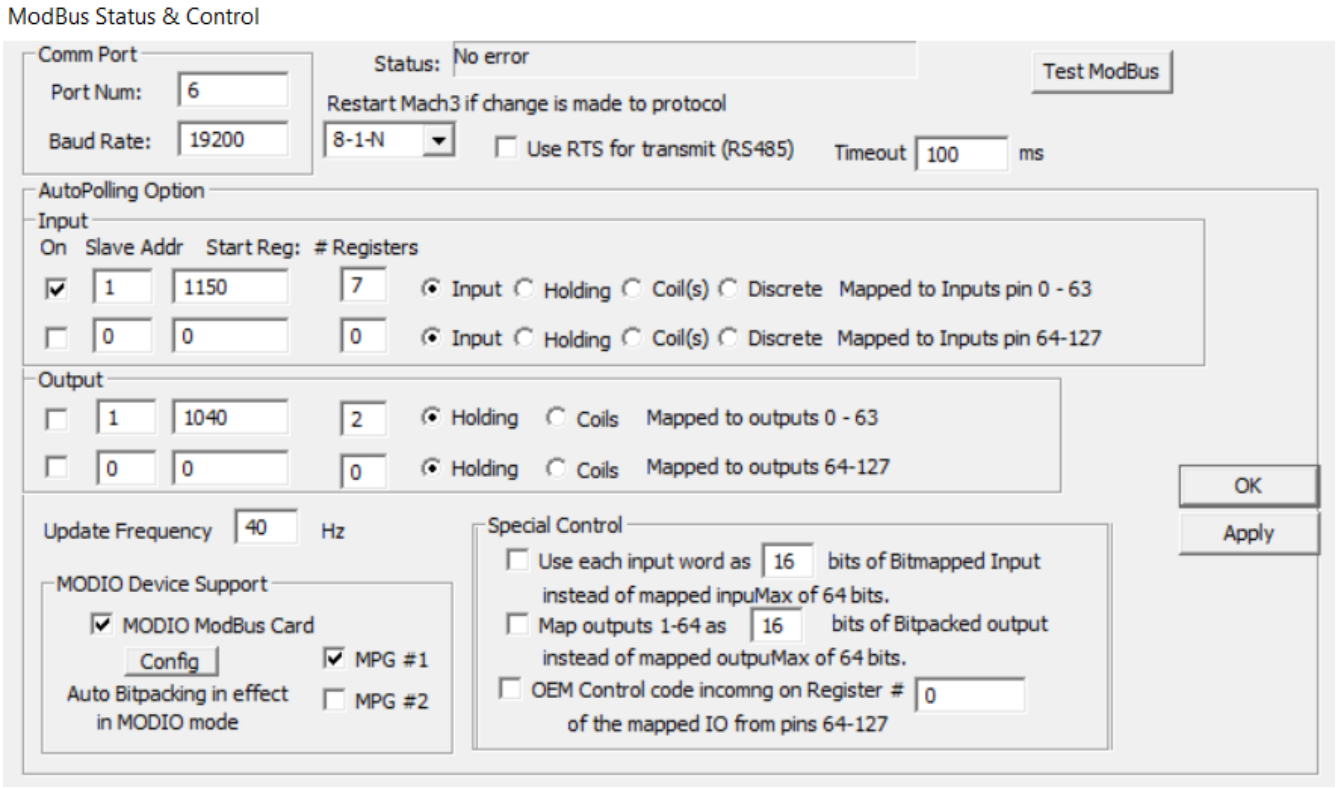
But you will need to confirm your install directory just to be sure.

Now open Mach 3, and navigate to the “General Config” window. (Config>General Config). Tick the “Run Macro Pump” radio box. Click “OK” to commit changes, and then close Mach 3.



7.0 Set Up ModBus

Open Mach 3 again, and then open “Setup Serial ModBus Control” (Function Cfg’s>Setup Serial ModBus Control). Make sure that all of your settings match those shown below. Note that The Comm Port Port Number will be the number you found in step 5.0. If everything is well and you have the correct port selected you will see “No error” in the Status bar at the top.

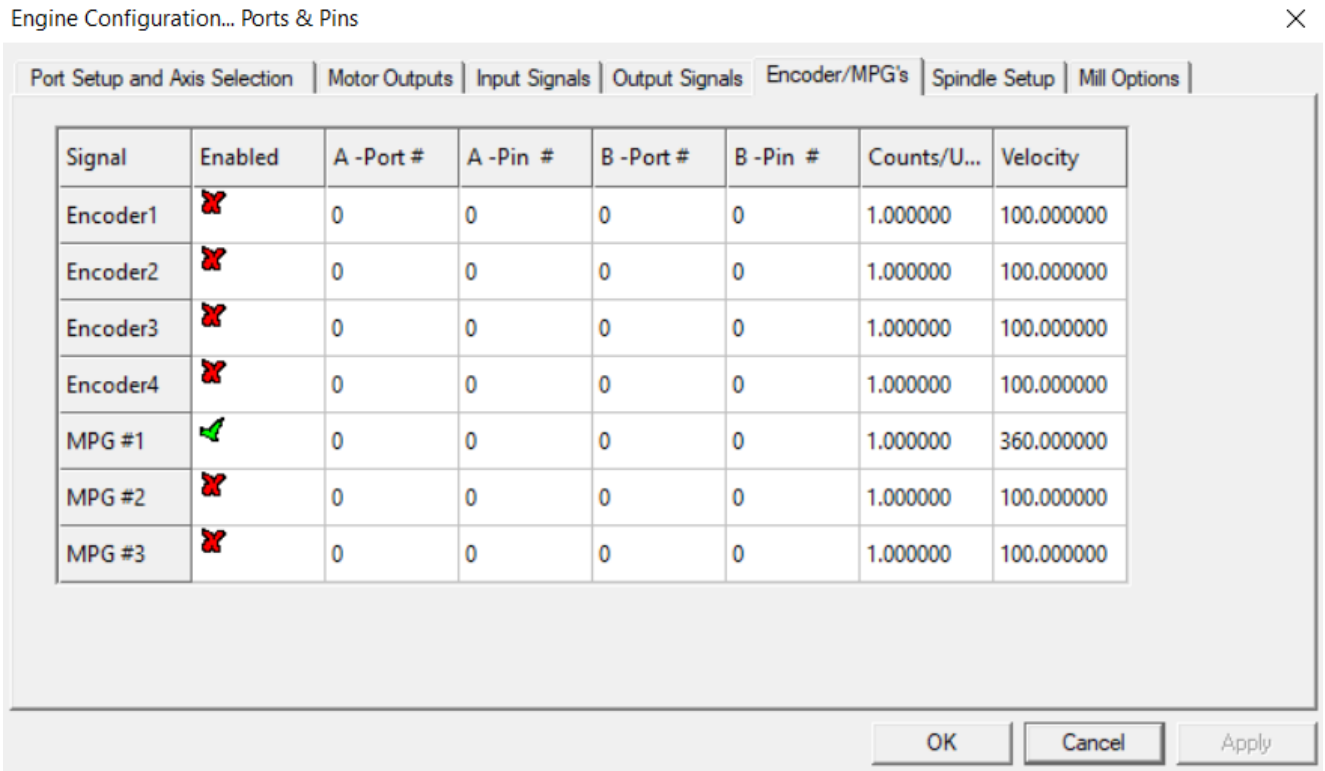


Once you are done, click “Apply” and then “OK” to commit your changes and close the window.

Close Mach 3 again.

8.0 Set MPG Options

Open Mach 3 again, and then open “Ports & Pins” (Config > Ports and Pins). Navigate to the “Encoder/MPG’s” Tab, and set MPG#1 as shown below. Note that the “Counts/Unit” and “Velocity” fields can be varied to change the behaviour of your pendant. We suggest those given below as good starting points, but do experiment and find settings that work well for you.



Signal	Enabled	A -Port #	A -Pin #	B -Port #	B -Pin #	Counts/U...	Velocity
Encoder1	✗	0	0	0	0	1.000000	100.000000
Encoder2	✗	0	0	0	0	1.000000	100.000000
Encoder3	✗	0	0	0	0	1.000000	100.000000
Encoder4	✗	0	0	0	0	1.000000	100.000000
MPG #1	✓	0	0	0	0	1.000000	360.000000
MPG #2	✗	0	0	0	0	1.000000	100.000000
MPG #3	✗	0	0	0	0	1.000000	100.000000

The “Counts/Unit” setting will change the pendant behaviour in the 1x, 10x and 100x pulse settings, and the “Velocity” setting will change the behaviour in the “Cont” (Continuous motion) pulse mode.

9.0 Using the Pendant

Your pendant should now be fully set up and functioning!

Use the “MPG Select” button to toggle between the axis you wish to control. Leaving it on “Keyboard” keeps the pendant in safe mode, preventing signal back to the machine. This is a good setting to leave it on when you are machining and don’t want a bump to the pendant to cause problems.

Use the “Motion Step” button to choose between continuous motion, 1x pulse multiplier, 10x pulse multiplier and 100x pulse multiplier modes. Note that in 1x, 10x & 100x modes, the pendant counts pulses and moves the axis accordingly – this means that if you command movement faster than the machine can keep up with it will lag and keep moving after you stop moving the handwheel. Because of this it is better to do your coarse movement in CONT mode where possible rather than 100x mode.

Turning the MPG handwheel will now increment the selected axis! Happy machining.

10.0 Appendix A – Drivers

This pendant uses the common CH340 USB to Serial chip driver. If you have ever used an Arduino, you have probably used this chip / driver combination before! If you're computer does not already have it and does not install it automatically when the pendant is plugged in, you can manually install it.

To manually install the drivers, download the .EXE installer utility HERE. Run the .EXE file (Windows may ask you if you are sure – you need to click yes to run it). You will see the window below pop up.

Click on "INSTALL" and the program will install the driver for you.

Sparkfun also have a good tutorial on the CH340 driver that you may be interested in. They also have a download link for a newer version of the driver.

https://learn.sparkfun.com/tutorials/how-to-install-ch340-drivers/all#meet-the-ch340

11.0 Reference Links

Viking Machinery - Home Page

www.vikingmachinery.co.nz

Viking Machinery - TradeMe Store

https://www.trademe.co.nz/Members/Listings.aspx?member=4906214

Viking Machinery - Email

Sales@vikingmachinery.co.nz

Viking Machinery - Social Media

https://www.instagram.com/james_viking_machinery/

https://www.thingiverse.com/VikingNZ/about

https://www.youtube.com/channel/UCgnl_7dUO9MeNOyI_jWO5QQ

https://grabcad.com/james.hussey-3

Mach3 Useful Links

http://www.machsupport.com/wp-content/uploads/2013/04/Mach3Version3.043.066.exe

http://www.machsupport.com/wp-content/uploads/2013/02/Mach3Mill_Install_Config.pdf