

Huanyang VFD Mach3 PlugIn Manual

Introduction

This plugin has been written for use with the Huanyang series of Variable Frequency Drives (VFD). It allows Mach3 to control the operation of the VFD via RS485 communication port.

Features

The plugin incorporates the following features

- Stop & Stop Spindle
- Set desired spindle RPM
- Monitor actual spindle RPM
- Monitor current draw of spindle
- Triggers 'Stop' or 'E-Stop' event if commands to VFD fail.

Requirements

In addition to the DLL, the plugin requires the Microsoft .NET 3.5 distribution. It can be downloaded [here](#) as full redistribution.

Known issues

No known issues.

Revision history

V3.0.1.0 First public release

VFD setup

This manual assumes you have setup your VFD with valid register settings for your spindle and input power etc. Only the required register changes required for this PlugIn will be covered here. The following table summarizes the register settings required for this PlugIn.

| Register | Value | Description |
|-----------------|--------------|---------------------------------------------------|
| PD001 | 2 | Allows commands from communication port |
| PD002 | 2 | Allows frequency control from communications port |
| PD163 | 1~250 | Specifies VFD address |
| PD164 | 0~3 | Specify baud. Recommend: 1(9600) |
| PD165 | 3 | 8N1 RTU |

Basic wiring

The only connection to the VFD for basic setup is the two wire RS-485 connection.

Plugin installation

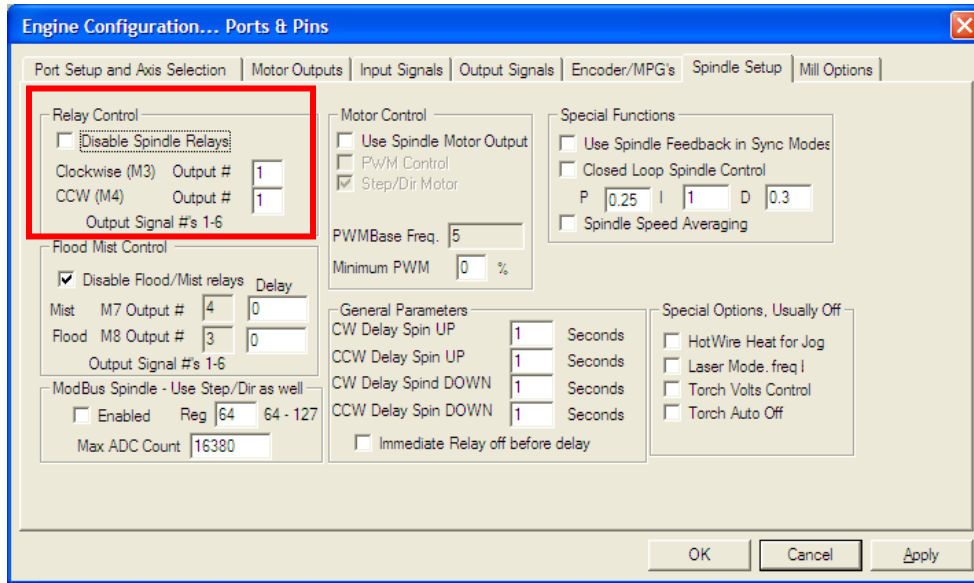
Installation of the plugin simply requires you to copy the DLL to the Mach3 plugins directory, typically "C:\Mach3\PlugIns" for the default installation.

Mach3 will automatically set the plugin to inactive when started for the first time. Open the 'Config Plugin' window by Menu->Config->Config Plugins. Enable the plugin by clicking on the red cross in the left column that corresponds to this plugin.

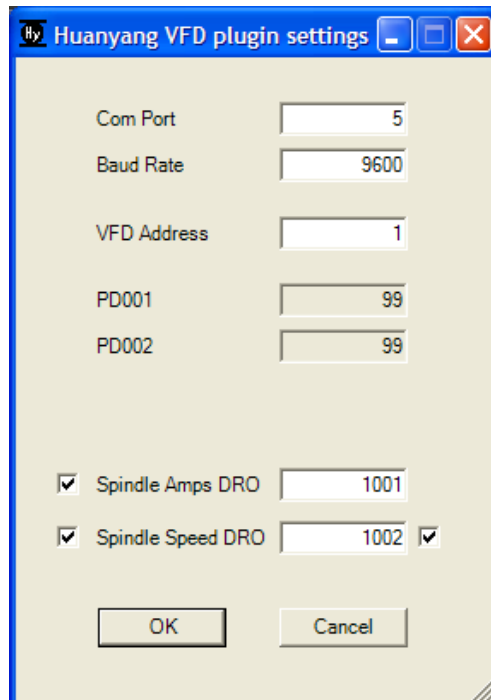
Mach will then need to be restarted.

Plugin configuration

Firstly, open Mach3 'Ports & Pins' config dialog. On the 'Spindle Setup' ensure the 'Disable Spindle Relays' checkbox is **unchecked**. This is required to enable the plugin to control the spindle.



Configuration of the plugin is via the dialog window opened via Menu->PlugIn Control->HuanyangVFD. The dialog shown below should appear.



Communication port setup

The default values for the communication port are Com1, 9600 baud, VFD Address: 1. If these are correct for your setup then the value for PD001 & PD002 should have been successfully read from the VFD and displayed in the corresponding boxes. If the default values of 99 are showing, then communication to the VFD has not been successful.

If the default values do not match your setup (i.e. different Com port #) make the required changes, press **OK and re-start Mach3**.

Register values

Once the PlugIn is communicating with the VFD, the values for registers PD001 & PD002 are shown. For the PlugIn to operate the spindle, these must both be set to '2'.

XML file parameters

The PlugIn will automatically add the required entries to your profile XML file. These can be changed manually with an appropriate editor if desired however all parameters can be accessed via the config dialog so this is not encouraged.

Basic operation

Once the communication has been successfully configured, the basic operation of the plugin will work immediately. The basic operation consists of starting, stopping and setting the speed of the spindle.

Advanced operation

In addition to the basic operation, additional info can be requested from the VFD.

Spindle speed display

Actual spindle speed can be requested from the VFD. This is requested approximately 5 times a second and should update in a similar fashion to the VFD LED display. The check button to the left of the 'Spindle Speed DRO' label enables this feature.

By default, the plugin will update the spindle speed via the Mach 'MainPlanner' and should display on the DRO within Mach3 without any changes. However, on my setup with an external motion controller this does not work. As a work-around I have made it possible to set a User DRO to store the speed. Your Mach3 Screenset of choice must then be edited to change the spindle speed DRO to access the User DRO.

Spindle current display

As there is no default DRO to display the spindle current draw you must allocate a user DRO if you wish to use this feature.

The check button to the left of the 'Spindle Amps DRO' label enables this feature.

Note: The valid range for a user DRO is 1001-1256

Other considerations

Minimum spindle speed

Some spindles (particularly air cooled spindles) should not be operated below a threshold frequency. There is currently no threshold setting within the plugin however a minimum speed can be set in *Menu->Config->Spindle Pulleys*.

E-stop considerations

It is recommended that a separate input be used on the VFD to trigger an emergency stop. A 'stop' command is issued to the spindle when Mach3 receives an estop/reset signal but this should not be relied upon as the only means of stopping the spindle.

Fault notification

No VFD fault notifications are read by the plugin. Again, it is recommended a fault input to Mach3 from the VFD be used to indicate a VFD fault.