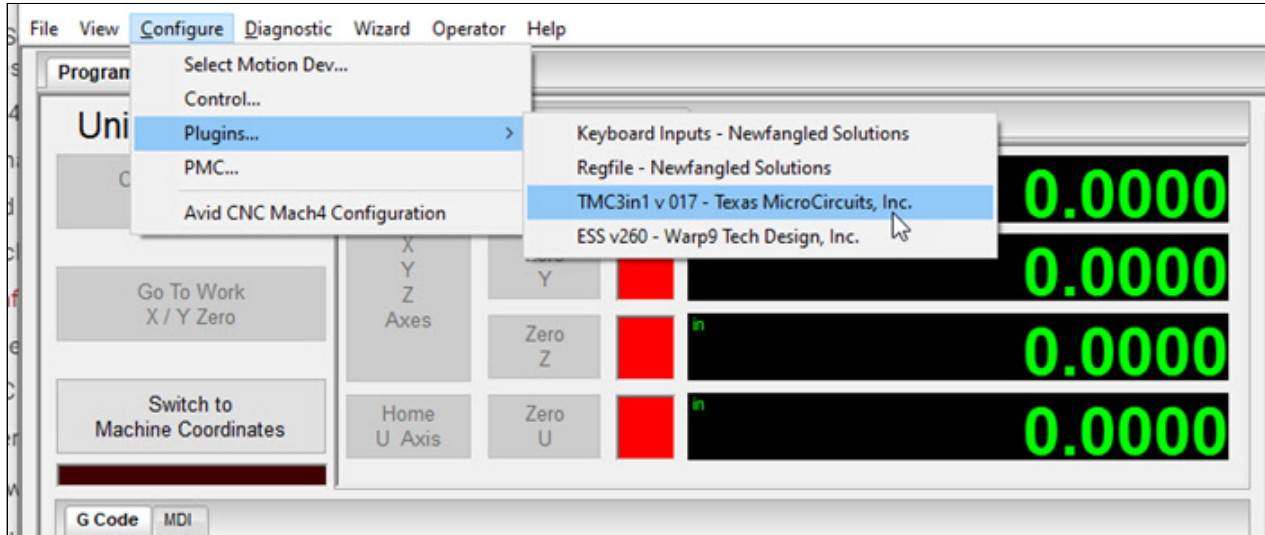# TMC3in1 Plugin Configuration Guide

v2020Q4.1

Configuring the TMC3in1 Plugin

There are additional TMC3in1 settings that can be accessed in the TMC3in1 plugin configuration menu shown below. Settings that will be used routinely in the operation of your PRO CNC Plasma system can be accessed directly in the Mach4 screen. These are detailed in the Mach4 Plasma Users Guide.
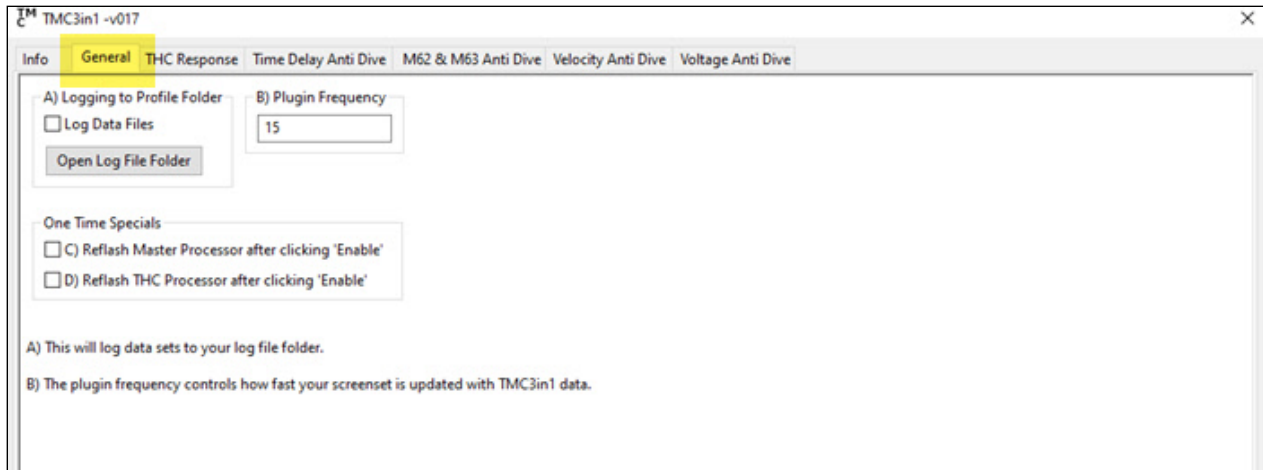

To access the TMC3in1 Plugin configuration navigate to TMC3in1 in the Plugins menu under the Configure pull down menu. *Any settings changes made from the TMC3in1 Plugin menu will be saved as defaults.*

> ℹ️ **Info**
>
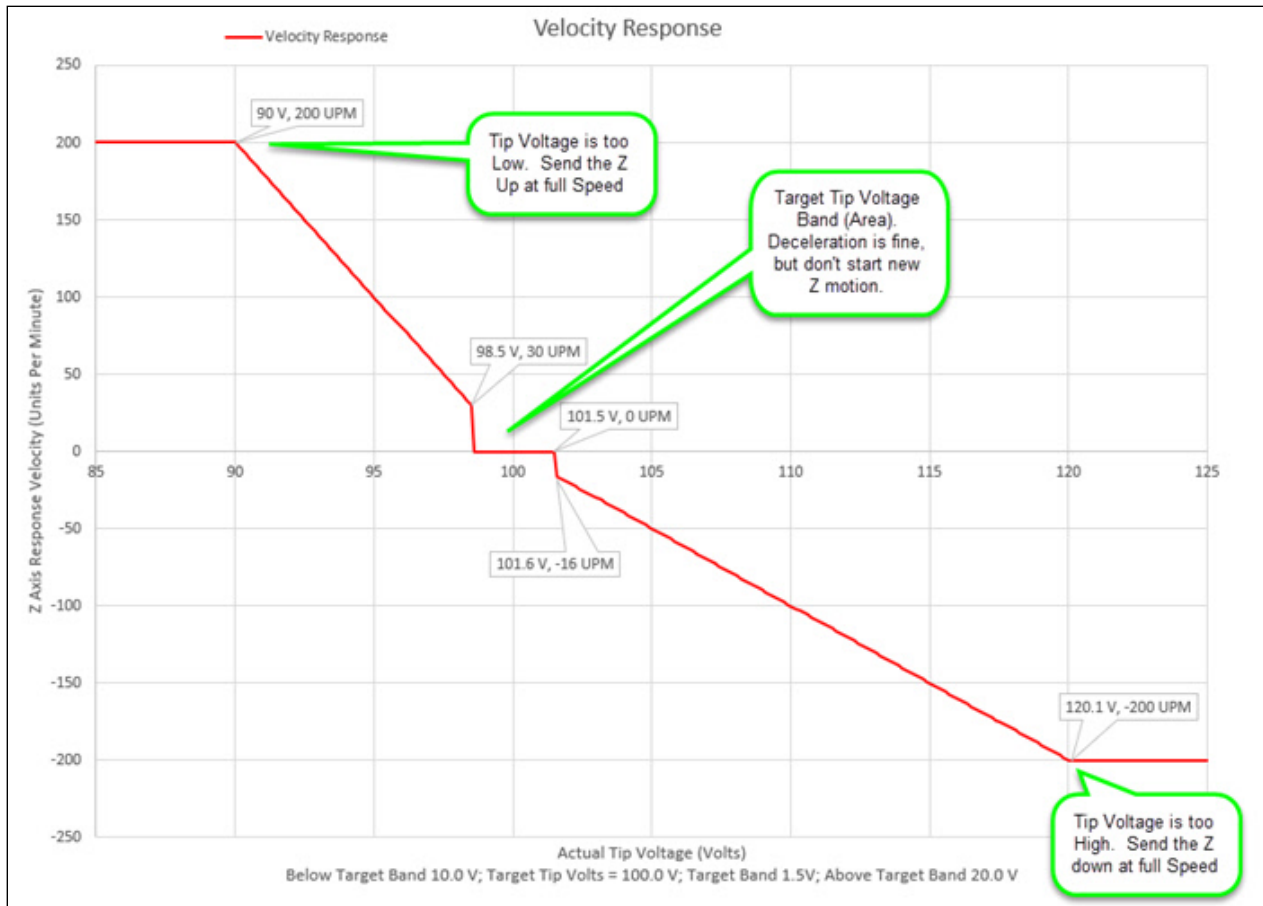> Mach4 must be disabled to access the TMC3in1 Plugin Configuration menu.

General

- **(A) Logging to Profile Folder** - This checkbox is the same as the toggle on the mainscreen diagnostics tab. The button will open the default logging file location (C:\Mach4Hobby\TMC3in1)

- **(B) Plugin Frequency** - This setting should not be changed without consulting Avid CNC support or Warp9 Tech Design support.

- **One Time Specials** - These settings should not be used without consulting Avid CNC support or Warp9 Tech Design support.

THC Response
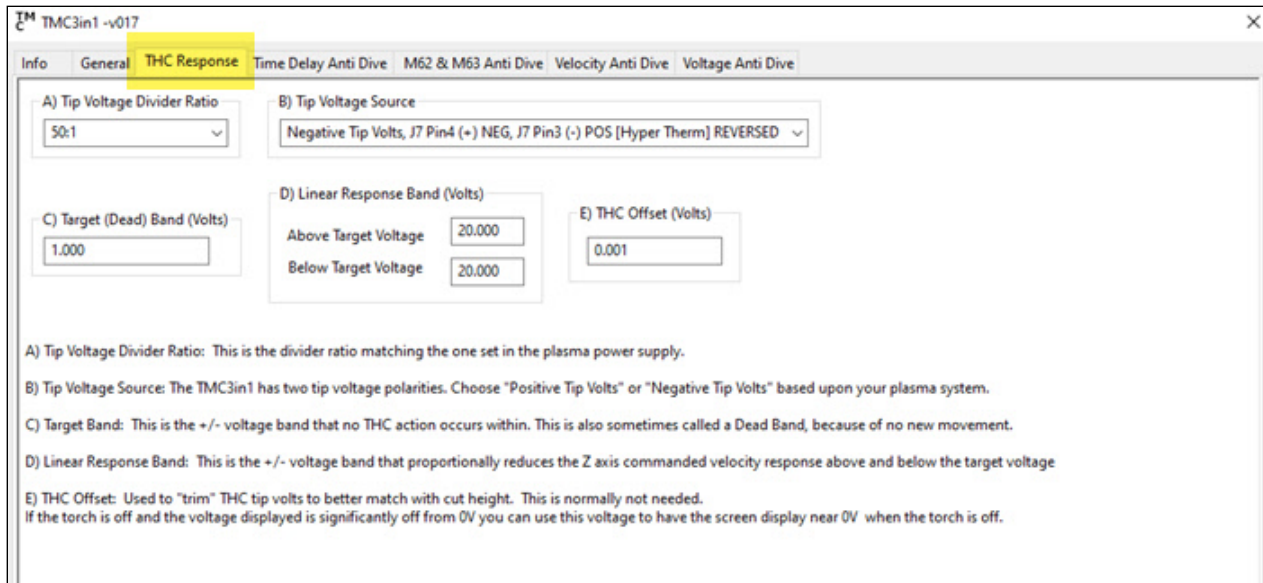
- **(A) Tip Voltage Divider Ratio** - This setting is based on the brand of plasma torch in use. Hypertherm torches always output a 50:1 divided arc voltage.

- **(B) Tip Voltage Source** - This setting is based on the brand of plasma torch in use. Hypertherm torches always output "Negative Tip Volts."

- **(C) Target Band** - This setting changes the "width" of the target voltage band. When the actual voltage is within this target band there will be no THC motion. (See next section).

- **(D) Linear Response Band** - This setting controls the +/- distance from the target tip volts which will produce a linearly proportional THC motion response. Above or below these set limits the THC motion will be commanded at maximum speed.

- **(D) THC Offset** - This setting is only useful in specific applications as a 'trim' adjustment and should not be used without consulting Avid CNC support or Warp9 Tech Design support.

THC Velocity Response

Velocity Response chart. Axes: Z Axis Response Velocity (Units Per Minute) vs Actual Tip Voltage (Volts). Below Target Band 10.0 V; Target Tip Volts = 100.0 V; Target Band 1.5V; Above Target Band 20.0 V.

Data points labeled: 90 V, 200 UPM (Tip Voltage is too Low. Send the Z Up at full Speed); 98.5 V, 30 UPM; 101.5 V, 0 UPM (Target Tip Voltage Band (Area). Deceleration is fine, but don't start new Z motion.); 101.6 V, -16 UPM; 120.1 V, -200 UPM (Tip Voltage is too High. Send the Z down at full Speed).

The above is a graphical representation of the THC motion (Z Axis Response Velocity - Y axis of graph) produced as a result of the incoming tip voltage signal from your plasma torch (Actual Tip Voltage - X Axis of graph). Reading the graph left to right, the data represents the following scenarios:

- **Z Axis Response Full Positive** - From 85 to 90 tip volts the actual voltage is below the target tip voltage by more than the negative linear response band setting. THC commanded Z-axis motion is positive at maximum velocity (in this example 200 units per minute).

- **Z Axis Response Linearly Positive** - From 90 to 98.5 tip volts the THC motion is commanded in the positive direction at a speed which is linearly proportional to the difference between the actual and target tip voltage.

- **Target Tip Voltage** - The target tip voltage is set to 100 volts in this example and the target tip voltage band is 3. From 98.5 to 101.5 (3 volt band) there is no commanded THC velocity as the actual voltage is within the target tip voltage band.

- **Z axis Response Linearly Negative** - From 101.5 to 120 tip volts the THC motion is commanded in the negative direction at a speed which is linearly proportional to the difference between the actual and target tip voltage.

- **Z Axis Response Full Negative** - From 120 to 125 tip volts the actual voltage is above the target tip voltage by more than the positive linear response band setting. THC commanded Z-axis motion is negative at maximum velocity (in this example 200 units per minute).
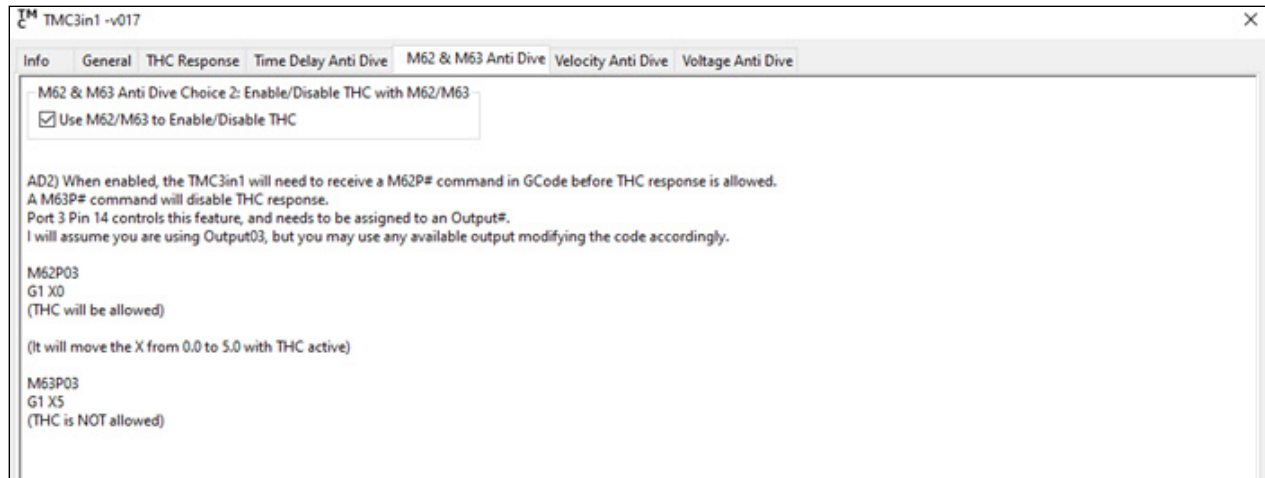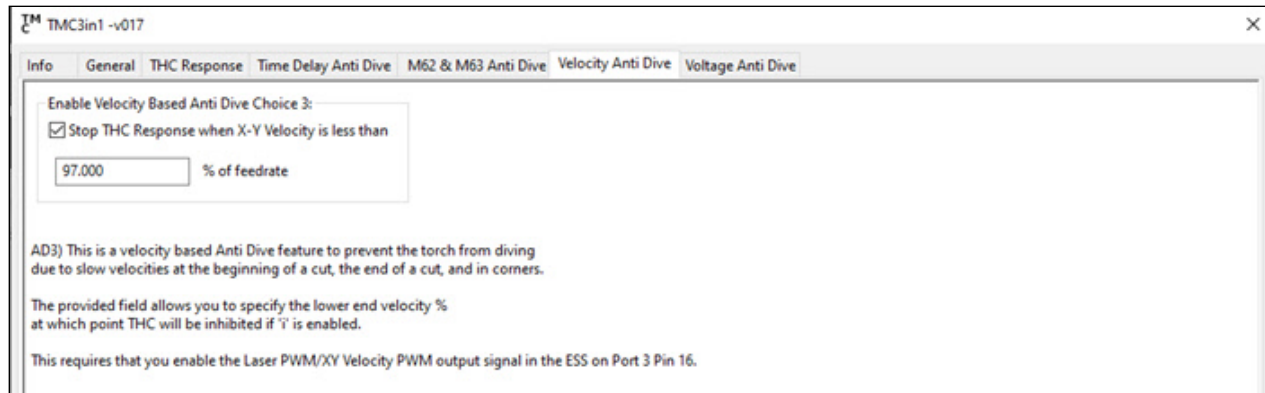
Time Delay Anti Dive
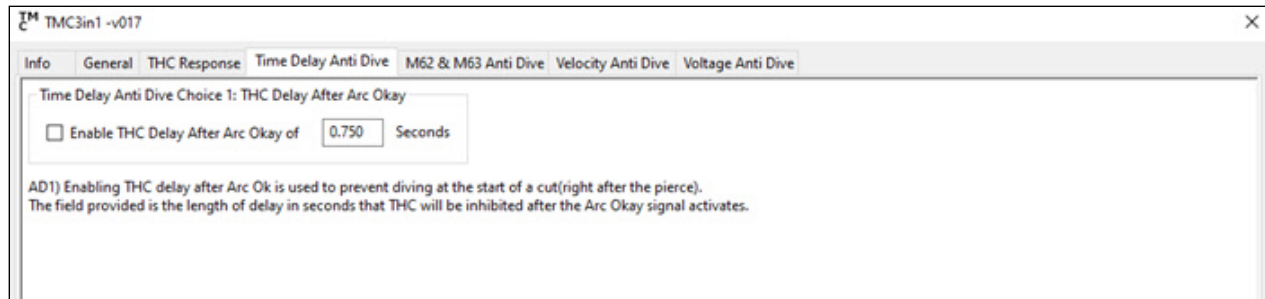
These anti-dive settings are the same as the THC main screen THC Anti-Dive tab. Changes made in the TMC3in1 plugin menu will be saved as default and overwrite defaults set by the THC main screen "Save as Default Anti-Dive Settings" button.

M62 & M63 Anti Dive

When enabled, the TMC3in1 will need to receive M62P4 commands in your GCode before THC response will be allowed. M63P4 commands can then be used to disable THC response. This type of anti-dive should not be disabled without consulting Avid CNC support.

Velocity Anti Dive

These anti-dive settings are the same as the main screen THC Anti-Dive tab. Changes made in the TMC3in1 plugin menu will be saved as default and overwrite defaults set by the THC main screen "Save as Default Anti-Dive Settings" button.

Voltage Anti Dive

These anti-dive settings are the same as the main screen THC Anti-Dive tab. Changes made in the TMC3in1 plugin menu will be saved as default and overwrite defaults set by the THC main screen "Save as Default Anti-Dive Settings" button.