

Mach3 (Version R3.043.062) Konfiguration mit ESS – Stepcraft 840/2 mit HF Spindel

Engine Configuration... Ports & Pins

Port Setup and Axis Selection | Motor Outputs | Input Signals | Output Signals | Encoder/MPG's | Spindle Setup | Mill Options

Port #1

Port Enabled

Port Address

Entry in Hex 0-9 A-F only

Port #2

Port Enabled

Port Address

Entry in Hex 0-9 A-F only

Pins 2-9 as inputs

OR

MaxNC Mode

Max CL Mode enabled

Max NC-10 Wave Drive

Program restart necessary

Kemel Speed

25000Hz
 35000Hz
 45000Hz
 60000Hz
 65000Hz
 75000Hz
 100kHz

Note: Software must be restarted and motors retuned if kemel speed is changed.

Restart if changed

Sherline 1/2 Pulse mode.
 ModBus InputOutput Support
 ModBus PlugIn Supported.
 TCP Modbus support
 Event Driven Serial Control

Engine Configuration... Ports & Pins

Port Setup and Axis Selection | Motor Outputs | Input Signals | Output Signals | Encoder/MPG's | Spindle Setup | Mill Options

Signal	Enabled	Step Pin#	Dir Pin#	Dir LowActi...	Step Low A...	Step Port	Dir Port
X Axis		5	4			1	1
Y Axis		3	2			1	1
Z Axis		7	6			1	1
A Axis		0	0			0	0
B Axis		0	0			0	0
C Axis		0	0			0	0
Spindle		17	17			1	1

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Signal	Enabled	Port #	Pin Number	Active Low	Emulated	HotKey
X ++		1	12			0
X --		1	12			0
X Home		1	12			0
Y ++		1	12			0
Y --		1	12			0
Y Home		1	12			0
Z ++		1	12			0
Z --		1	12			0
Z Home		1	12			0

Pins 10-13 and 15 are inputs. Only these 5 pin numbers may be used on this screen

Automated Setup of Inputs

OK | Abbrechen | Übernehmen

Engine Configuration... Ports & Pins

Port Setup and Axis Selection | Motor Outputs | **Input Signals** | Output Signals | Encoder/MPG's | Spindle Setup | Mill Options

Signal	Enabled	Port #	Pin Number	Active Low	Emulated	HotKey
A ++		1	13			0
A --		1	13			0
A Home		1	15			0
B ++		0	0			0
B --		0	0			0
B Home		0	0			0
C ++		0	0			0
C --		0	0			0
C Home		0	0			0

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Signal	Enabled	Port #	Pin Number	Active Low	Emulated	HotKey
Input #1		0	0			0
Input #2		0	0			0
Input #3		0	0			0
Input #4		0	0			0
Probe		1	10			0
Index		0	0			0
Limit Ovrld		0	0			0
EStop		1	11			0
THC On		0	0			0

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Automated Setup of Inputs

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Port Setup and Axis Selection | Motor Outputs | **Input Signals** | Output Signals | Encoder/MPG's | Spindle Setup | Mill Options

Signal	Enabled	Port #	Pin Number	Active Low	Emulated	HotKey
THC Up		0	0			0
THC Down		0	0			0
OEM Trig #1		0	0			0
OEM Trig #2		0	0			0
OEM Trig #3		0	0			0
OEM Trig #4		0	0			0
OEM Trig #5		0	0			0
OEM Trig #6		0	0			0
OEM Trig #7		0	0			0

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Automated Setup of Inputs

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Port Setup and Axis Selection | Motor Outputs | **Input Signals** | Output Signals | Encoder/MPG's | Spindle Setup | Mill Options

Signal	Enabled	Port #	Pin Number	Active Low	Emulated	HotKey
OEM Trig #8		0	0			0
OEM Trig #9		0	0			0
OEM Trig #10		0	0			0
OEM Trig #11		0	0			0
OEM Trig #12		0	0			0
OEM Trig #13		0	0			0
OEM Trig #14		0	0			0
OEM Trig #15		0	0			0
Timing		0	0			0

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Automated Setup of Inputs

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Engine Configuration... Ports & Pins

Port Setup and Axis Selection | Motor Outputs | **Input Signals** | Output Signals | Encoder/MPG's | Spindle Setup | Mill Options

Signal	Enabled	Port #	Pin Number	Active Low	Emulated	HotKey
Jog X++		0	0			0
Jog X--		0	0			0
Jog Y++		0	0			0
Jog Y--		0	0			0
Jog Z++		0	0			0
Jog Z--		0	0			0
Jog A++		0	0			0
Jog A--		0	0			0

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Automated Setup of Inputs

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Signal	Enabled	Port #	Pin Number	Active Low
Digit Trig		0	0	
Enable1		0	0	
Enable2		0	0	
Enable3		0	0	
Enable4		0	0	
Enable5		0	0	
Enable6		0	0	
Output #1		1	1	
Output #2		1	14	
Output #3		1	16	

Pins 2 - 9 , 1, 14, 16, and 17 are output pins. No other pin numbers should be used.

OK | Abbrechen | Übernehmen

Engine Configuration... Ports & Pins

Port Setup and Axis Selection | Motor Outputs | Input Signals | Output Signals | Encoder/MPG's | Spindle Setup | Mill Options

Signal	Enabled	Port #	Pin Number	Active Low
Output #3		1	16	
Output #4		0	0	
Output #5		0	0	
Output #6		0	0	
Charge Pump		0	0	
Charge Pump2		0	0	
Current Hi/Low		0	0	
Output #7		0	0	
Output #8		0	0	
Output #9		0	0	

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Port Setup and Axis Selection | Motor Outputs | Input Signals | Output Signals | Encoder/MPG's | Spindle Setup | Mill Options

Signal	Enabled	Port #	Pin Number	Active Low
Output #9	<input checked="" type="checkbox"/>	0	0	<input checked="" type="checkbox"/>
Output #10	<input checked="" type="checkbox"/>	0	0	<input checked="" type="checkbox"/>
Output #11	<input checked="" type="checkbox"/>	0	0	<input checked="" type="checkbox"/>
Output #12	<input checked="" type="checkbox"/>	0	0	<input checked="" type="checkbox"/>
Output #13	<input checked="" type="checkbox"/>	0	0	<input checked="" type="checkbox"/>
Output #14	<input checked="" type="checkbox"/>	0	0	<input checked="" type="checkbox"/>
Output #15	<input checked="" type="checkbox"/>	0	0	<input checked="" type="checkbox"/>
Output #16	<input checked="" type="checkbox"/>	0	0	<input checked="" type="checkbox"/>
Output #17	<input checked="" type="checkbox"/>	0	0	<input checked="" type="checkbox"/>
Output #18	<input checked="" type="checkbox"/>	0	0	<input checked="" type="checkbox"/>

Pins 2 - 9 , 1, 14, 16, and 17 are output pins. No other pin numbers should be used.

OK | Abbrechen | Übernehmen

Engine Configuration... Ports & Pins

Port Setup and Axis Selection | Motor Outputs | Input Signals | Output Signals | Encoder/MPG's | Spindle Setup | Mill Options

Signal	Enabled	Port #	Pin Number	Active Low
Output #12	<input checked="" type="checkbox"/>	0	0	<input checked="" type="checkbox"/>
Output #13	<input checked="" type="checkbox"/>	0	0	<input checked="" type="checkbox"/>
Output #14	<input checked="" type="checkbox"/>	0	0	<input checked="" type="checkbox"/>
Output #15	<input checked="" type="checkbox"/>	0	0	<input checked="" type="checkbox"/>
Output #16	<input checked="" type="checkbox"/>	0	0	<input checked="" type="checkbox"/>
Output #17	<input checked="" type="checkbox"/>	0	0	<input checked="" type="checkbox"/>
Output #18	<input checked="" type="checkbox"/>	0	0	<input checked="" type="checkbox"/>
Output #19	<input checked="" type="checkbox"/>	0	0	<input checked="" type="checkbox"/>
Output #20	<input checked="" type="checkbox"/>	0	0	<input checked="" type="checkbox"/>

Pins 2 - 9 , 1, 14, 16, and 17 are output pins. No other pin numbers should be used.

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Engine Configuration... Ports & Pins

Port Setup and Axis Selection | Motor Outputs | Input Signals | Output Signals | Encoder/MPG's | Spindle Setup | Mill Options

Signal	Enabled	A -Port #	A -Pin #	B -Port #	B -Pin #	Counts/U...	Velocity
Encoder1	<input checked="" type="checkbox"/>	0	0	0	0	1.000000	100.000000
Encoder2	<input checked="" type="checkbox"/>	0	0	0	0	1.000000	100.000000
Encoder3	<input checked="" type="checkbox"/>	0	0	0	0	1.000000	100.000000
Encoder4	<input checked="" type="checkbox"/>	0	0	0	0	1.000000	100.000000
MPG #1	<input checked="" type="checkbox"/>	0	0	0	0	1.000000	100.000000
MPG #2	<input checked="" type="checkbox"/>	0	0	0	0	1.000000	100.000000
MPG #3	<input checked="" type="checkbox"/>	0	0	0	0	1.000000	100.000000

OK | Abbrechen | Übernehmen

Engine Configuration... Ports & Pins

Port Setup and Axis Selection | Motor Outputs | Input Signals | Output Signals | Encoder/MPG's | Spindle Setup | Mill Options

Relay Control

Disable Spindle Relays

Clockwise (M3) Output #

CCW (M4) Output #

Output Signal #'s 1-6

Motor Control

Use Spindle Motor Output

PWM Control

Step/Dir Motor

PWMBase Freq.

Minimum PWM %

Special Functions

Use Spindle Feedback in Sync Modes

Closed Loop Spindle Control

P I D

Spindle Speed Averaging

Flood Mist Control

Disable Flood/Mist relays Delay

Mist M7 Output #

Flood M8 Output #

Output Signal #'s 1-6

General Parameters

CW Delay Spin UP Seconds

CCW Delay Spin UP Seconds

CW Delay Spind DOWN Seconds

CCW Delay Spin DOWN Seconds

Immediate Relay off before delay

Special Options, Usually Off

HotWire Heat for Jog

Laser Mode. freq I

Torch Volts Control

Torch Auto Off

ModBus Spindle - Use Step/Dir as well

Enabled Reg 64 - 127

Max ADC Count

OK | Abbrechen | Übernehmen

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Engine Configuration... Ports & Pins

Port Setup and Axis Selection | Motor Outputs | Input Signals | Output Signals | Encoder/MPG's | Spindle Setup | Mill Options

Z - Inhibit
 Z - Inhibit On
 Max Depth Units
 Persistent

Compensation G41,G42
 Advanced Compensation Analysis

Digitizing
 4 Axis Point Clouds
 Add Axis Letters to Coordinates

Loop Control
 Allow Servo Hold on Input#1
 Max CL Closed Loop Emulation

THC Options
 Allow THC UP/DOWN Control even if not in THC Mode.
 G28.1 No Initial Move.
 Set OUTPUT5 when in THC

General Options
 Homed true when no home swithes
 G73 Pullback

OK | Abbrechen | Überehmen

Motor Tuning and Setup

X - AXIS MOTOR MOVEMENT PROFILE

Velocity

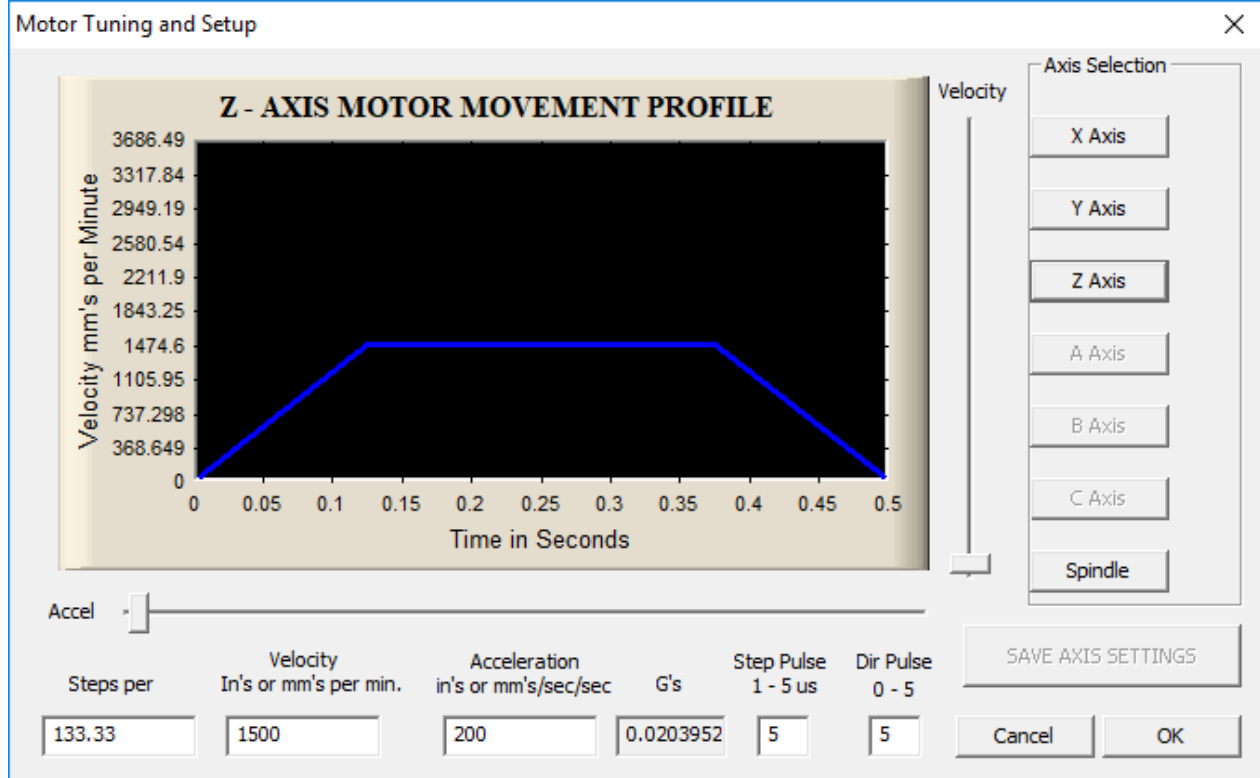
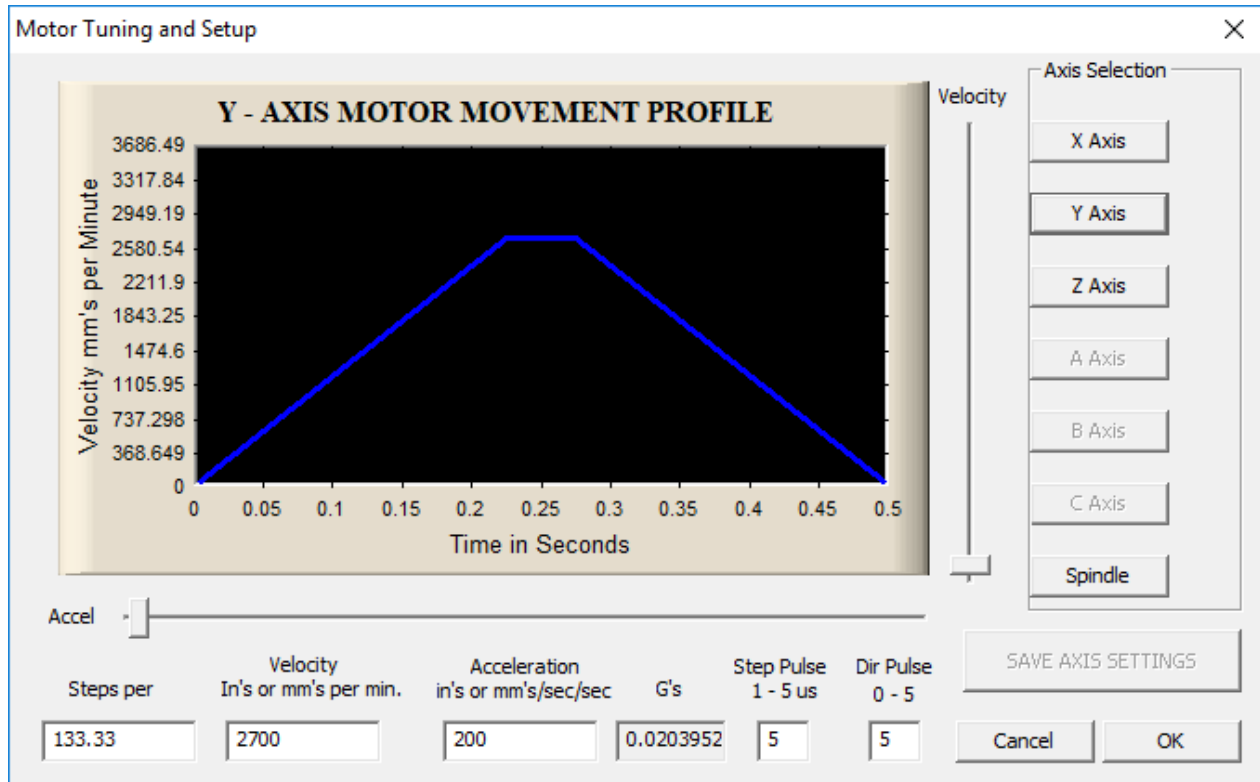
Axis Selection

Accel

Steps per	Velocity In's or mm's per min.	Acceleration in's or mm's/sec/sec	G's	Step Pulse 1 - 5 us	Dir Pulse 0 - 5
<input type="text" value="133.33"/>	<input type="text" value="2700"/>	<input type="text" value="200"/>	<input type="text" value="0.0203952"/>	<input type="text" value="5"/>	<input type="text" value="5"/>

SAVE AXIS SETTINGS
 Cancel | OK

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Mach3 (Version R3.043.062) Konfiguration mit ESS – Stepcraft 840/2 mit HF Spindel

Motor Tuning and Setup

SPINDLE MOTOR MOVEMENT PROFILE

Velocity mm's per Minute: 61.44, 55.296, 49.152, 43.008, 36.864, 30.72, 24.576, 18.432, 12.288, 6.144, 0

Time in Seconds: 0, 0.05, 0.1, 0.15, 0.2, 0.25, 0.3, 0.35, 0.4, 0.45, 0.5

Axis Selection

Velocity

X Axis

Y Axis

Z Axis

A Axis

B Axis

C Axis

Spindle

SAVE AXIS SETTINGS

Accel

Steps per	Velocity In's or mm's per min.	Acceleration in's or mm's/sec/sec	G's	Step Pulse 1 - 5 us	Dir Pulse 0 - 5
1000	60	5000	0.50988	5	5

Cancel OK

General Logic Configuration

G20,G21 Control

Lock DRO's to setup units

Tool Change

Ignore Tool Change

Stop Spindle, Wait for Cycle Start

AutoTool Changer

Angular Properties

Unchecked for Linear

A-Axis is Angular

B-Axis is Angular

C-Axis is Angular

Pgm End or M30 or Rewind

Turn off all outputs

E-Stop the system

Perform G32.1

Remove Tool Offset

Radius Comp Off

Turn Off Spindle

M01 Control

Stop on M1 Command

Serial Output

ComPort # 1 BaudRate 9600

8-Bit 1 Stop 7 Bit 2-Stop

Program Safety

Program Safety Lockout

This disables program translation while the External Activation #1 input is activated.

Editor

GCode Editor

\\WinNT\Notepad.exe

Startup Modals Use Init String on ALL "Resets"

Initialization String
G80

Motion Mode

Constant Velocity Exact Stop

Distance Mode Absolute Inc

IJ Mode Absolute Inc

Active Plane of Movement

XY YZ XZ

Jog Increments in Cycle Mode

Position 1	1
	0.1
	0.01
	0.001
Use 999 to indicate a	0.0001
Continuous Jog selection.	1
	0.1
	0.01
	0.001
Position 10	0.0001

Shuttle Wheel Setting

Shuttle Accel. 0.0001 Seconds

General Configuration

Z is 2.5D on Output #6

Home Sw. Safety

LookAhead 500 Lines

Ignore M calls while loading

M9- Execute after Block

UDP Pendant Control

Run Macro Pump

ChargePump On in EStop

Persistent Jog Mode

FeedOverride Persist

No System Menu in Mach3

Use Key Clicks

Home Slave with Master Axis

Include TLD in Z from G31

Lock Rapid FRD to Feed FRD

Rotational

Rot 360 rollover

Ang Short Rot on G0

Rotational Soft Limits

Screen Control

Hi-Res Screens

Boxed DRO's and Graphics

Auto Screen Enlarge

Flash Errors and comments.

Inputs Signal Debouncing/Noise rejection

Debounce Interval 50 x 40us

Index Debounce 50

General Configuration

Disable Gouge/Concavity Checks

G04 Dwell in ms

Use WatchDogs

Debug This Run

Enhanced Pulsing

Allow Wave Files

Allow Speech

Set Charge Pump to 5Khz -Laser Stndby

Use OUTPUT20 as Dwell Trigger

No FRD on Queue

100 Turn Manual Spindle Incr.

10 Spindle OV increment

CV Control

Plasma Mode

CV Dist Tolerance 180 Units..

G100 Adaptive NurbsCV

Stop CV on angles > 90 Degrees

Axis DRO Properties

Tool Selections Persistent

Optional Offset Save

Persistent Offsets

Persistent DROs

Copy G54 from G59.253 on startup

OK

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Motor Home/SoftLimits ✕

Entries are in setup units.

Axis	Reversed	Soft Max	Soft Min	Slow Zone	Home Off.	Home N...	Auto Zero	Speed %
X		830.00	0.00	10.00	829.9782			25
Y		601.00	0.00	10.00	600.9825			25
Z		100.00	-10.00	7.00	100.0000			25
A		100.00	-100.00	1.00	0.0000			35
B		100.00	-100.00	1.00	0.0000			20
C		100.00	-100.00	1.00	0.0000			20

G28 home location coordinates

X	<input type="text" value="0"/>	A	<input type="text" value="0"/>
Y	<input type="text" value="0"/>	B	<input type="text" value="0"/>
Z	<input type="text" value="0"/>	C	<input type="text" value="0"/>

PlugIn Control and Activation ✕

Enabled	PlugIn Name	Config
	ESS_Mach3	CONFIG
	Flash-FlashScreen-SWF-PlugIn-A.Fenerty--B.-Barker-...	CONFIG
	JoyStick-JoyStick-PlugIn--Art-Fenerty-Ver-1.0a	CONFIG
	PrinterScope-Port-Scope-1.00.046	CONFIG
	TurnDiags-Turn-Diags-1.00.1	CONFIG
	Video---B.Barker-Ver-1.0	CONFIG

Mach3 (Version R3.043.062) Konfiguration mit ESS – Stepcraft 840/2 mit HF Spindel

ESS-M3-160630-u4f1b - Ethernet IP Config ✕

IP Address of the Ethernet SmoothStepper board.
The factory default is 10.9.9.9

Use this value unless you have programmed a different address into the board using the Configurator program.

Main Config: ESS-M3-160630-u4f1b ✕

Controller Frequency The Controller Frequency controls how many times per second the velocity is updated when outputting pulses.

At 250 Hz, up to 4 seconds of data can be queued up. Each doubling of frequency halves the buffer length, so at 500 Hz, 2 seconds can be buffered, 1 kHz, 1 second, etc.

Max Step Frequency

X-axis	<input type="text" value="256 kHz"/>
Y-axis	<input type="text" value="256 kHz"/>
Z-axis	<input type="text" value="256 kHz"/>
A-axis	<input type="text" value="256 kHz"/>
B-axis	<input type="text" value="256 kHz"/>
C-axis	<input type="text" value="256 kHz"/>
Spindle	<input type="text" value="32 kHz"/>

Output Mode

Step and Direction	CW/CCW	Quadrature
X <input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Y <input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Z <input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
A <input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
B <input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
C <input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Watchdog

If the PlugIn fails to communicate with the device within the amount of time listed below, an EStop will be triggered in the device.

The time is in seconds and is rounded to the nearest tenth of a second. Max value is 3.1 seconds.

Port 2 Pins 2 through 9 Direction

Port 3 Pins 2 through 9 Direction

Noise Filtering of Inputs

An input must be stable for the specified amount of time in microseconds before it will be considered valid. Values will be assigned to groups of similar signals.

The specified values will be rounded to the nearest multiple of about 1.43 microseconds. To disable filtering for a given groups of inputs, use a value of 0.0 microseconds.

Encoders/MPGs	<input type="text" value="0.00"/>	(includes A, B, Index, and timing)	Probe	<input type="text" value="0.00"/>
Miscellaneous	<input type="text" value="0.00"/>	(Miscellaneous covers all other inputs)	EStop	<input type="text" value="0.00"/>
			Jog	<input type="text" value="0.00"/>
			Limits	<input type="text" value="0.00"/>
			Home	<input type="text" value="0.00"/>

M11Px/M10Px Commands

Output Mode	Input Mode
<input checked="" type="checkbox"/> Output Mode (normal default mode)	<input type="checkbox"/> Input Mode
M11Px/M10Px Gates Spindle Output <input type="checkbox"/>	M10 OEM Trigger #: <input type="text"/>
Output Number to use for M11P#/M10P#: <input type="text" value="0"/>	M11 OEM Trigger #: <input type="text"/>

Dwell time associated with M11/M10 Commands

M11

Dwell selected in this config Delay: milliseconds

Dwell selected Via User DRO User DRO #:

M10

Dwell selected in this config Delay: milliseconds

Dwell selected Via User DRO User DRO #:

Spindle

Relay or None <input type="checkbox"/>	PWM <input checked="" type="checkbox"/> Base Hz <input type="text" value="925"/>	Step and Dir <input type="checkbox"/> Pulse Width (us) <input type="text" value="4.0"/>	CW / CCW <input type="checkbox"/>
Spindle Index Prescale <input type="text" value="1"/>	Max of 4096. Set to 1 for no prescale (default)		Quadrature <input type="checkbox"/>

Miscellaneous

<input type="checkbox"/> De-Reference Axes in EStop	<input type="checkbox"/> THC Mode
<input type="checkbox"/> Don't Report Port and Pin Warnings	
<input type="text" value="1023"/> Number of Data Points Mach Should Pre-Calculate	

Homing

<input type="checkbox"/> Support Multi-Axis (but G28.1 will not work right)	<input checked="" type="checkbox"/> Single Axis at a time
---	---

XY PWM Velocity Output

Output Number for the XY Velocity PWM signal. This will be a 130 kHz signal that has a PWM duty cycle equal to current XY Velocity / requested Feedrate. This is not for lasers. You will need to assign a pin and port for the Output # you choose.

Spindle PWM Proportional to XY Feed Rate (also used for lasers). This is output on the Spindle Step Pin. When enabled, the spindle PWM is a function of the XY Feed Rate.

The mapping function is a table in the specified file located in the Plugins folder of the Mach directory. See our website's 'FAQ Mach3' for a sample file.

Enable

Mapping Function Filename: