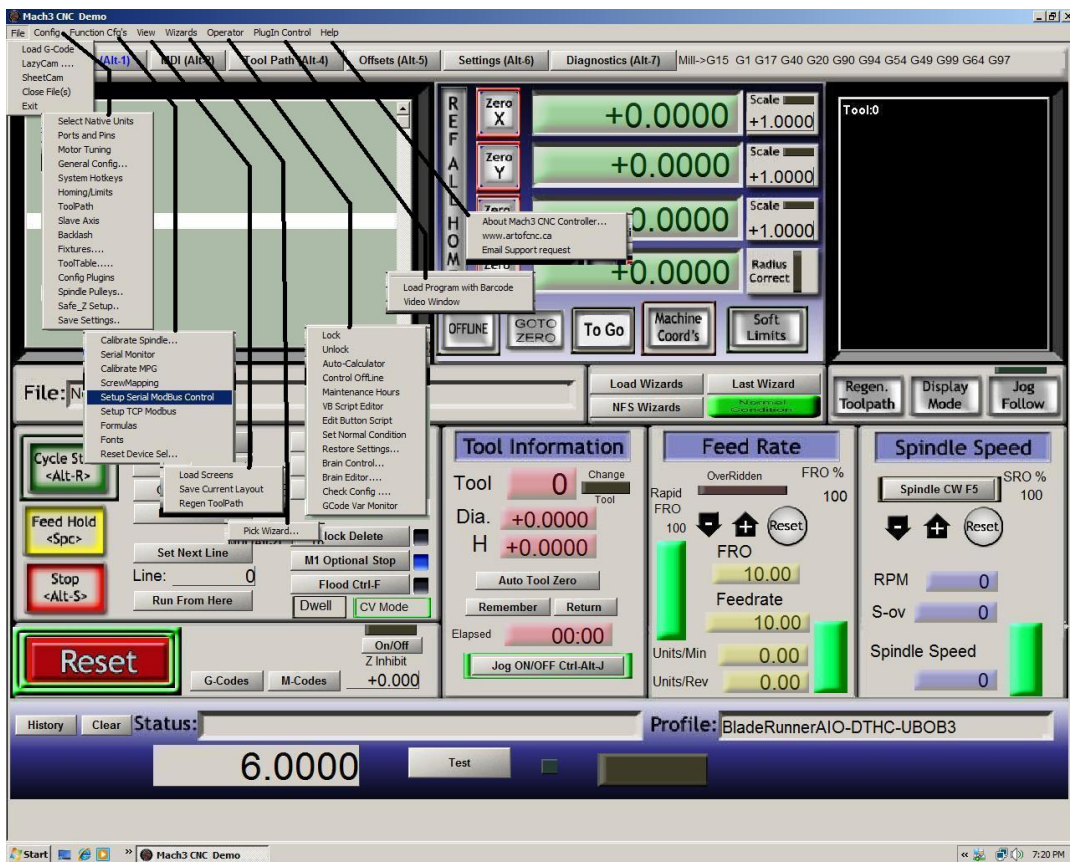


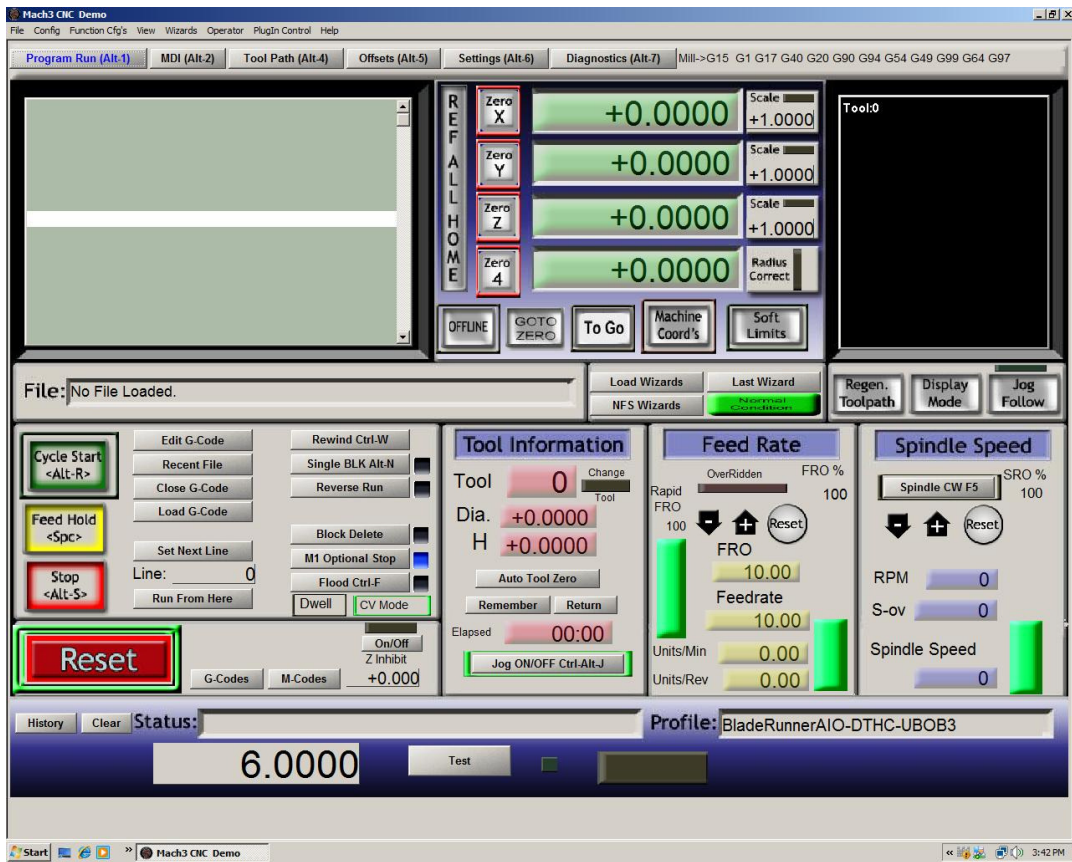


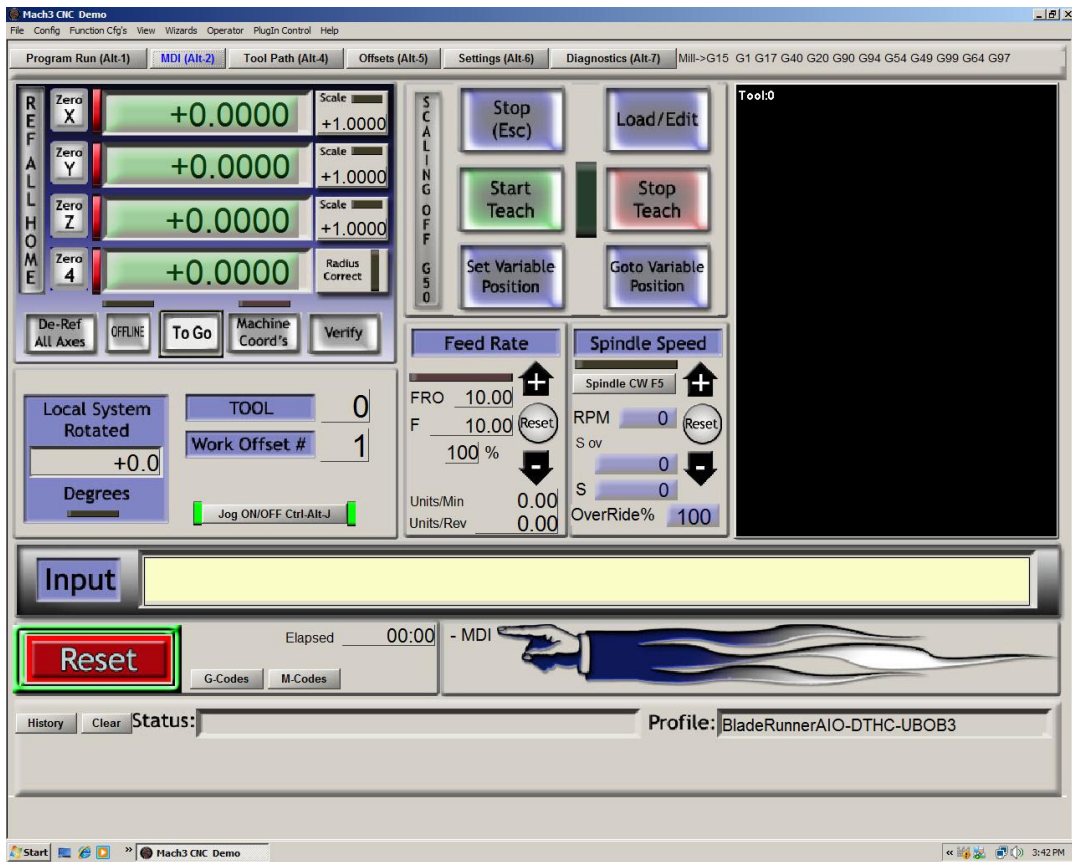
ArtSoft
Division of Newfangled Solutions

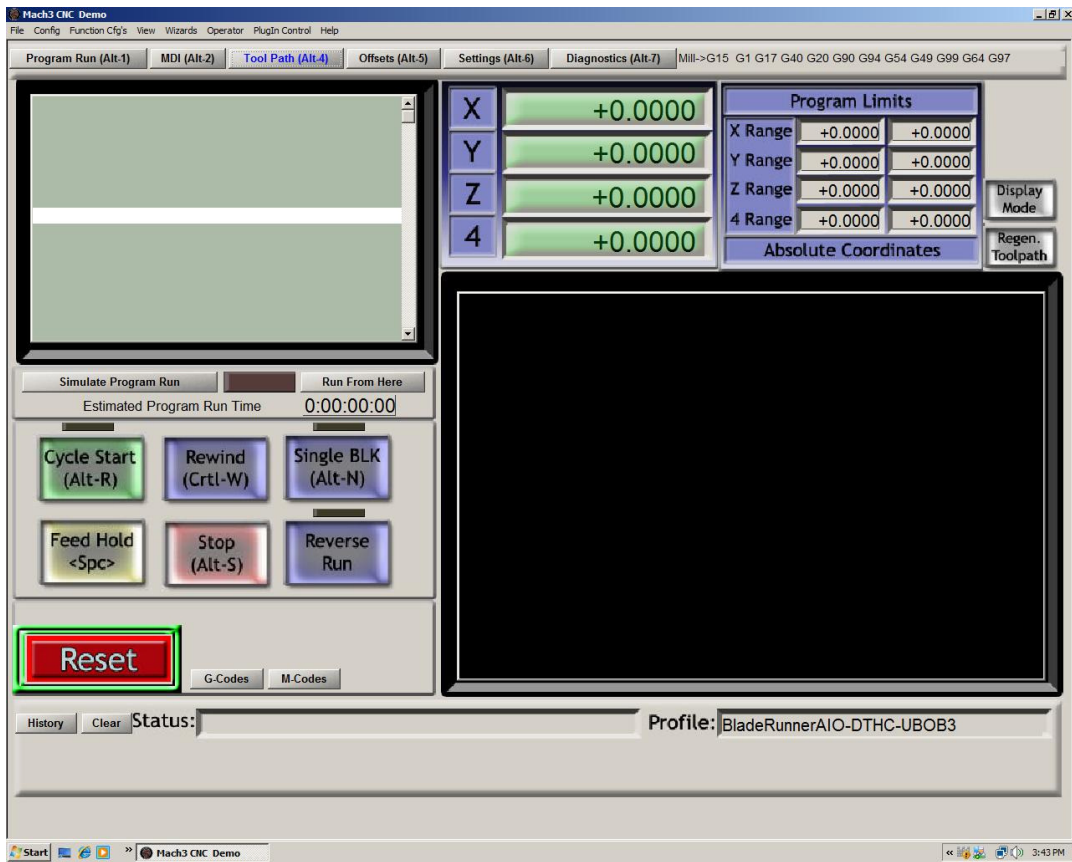


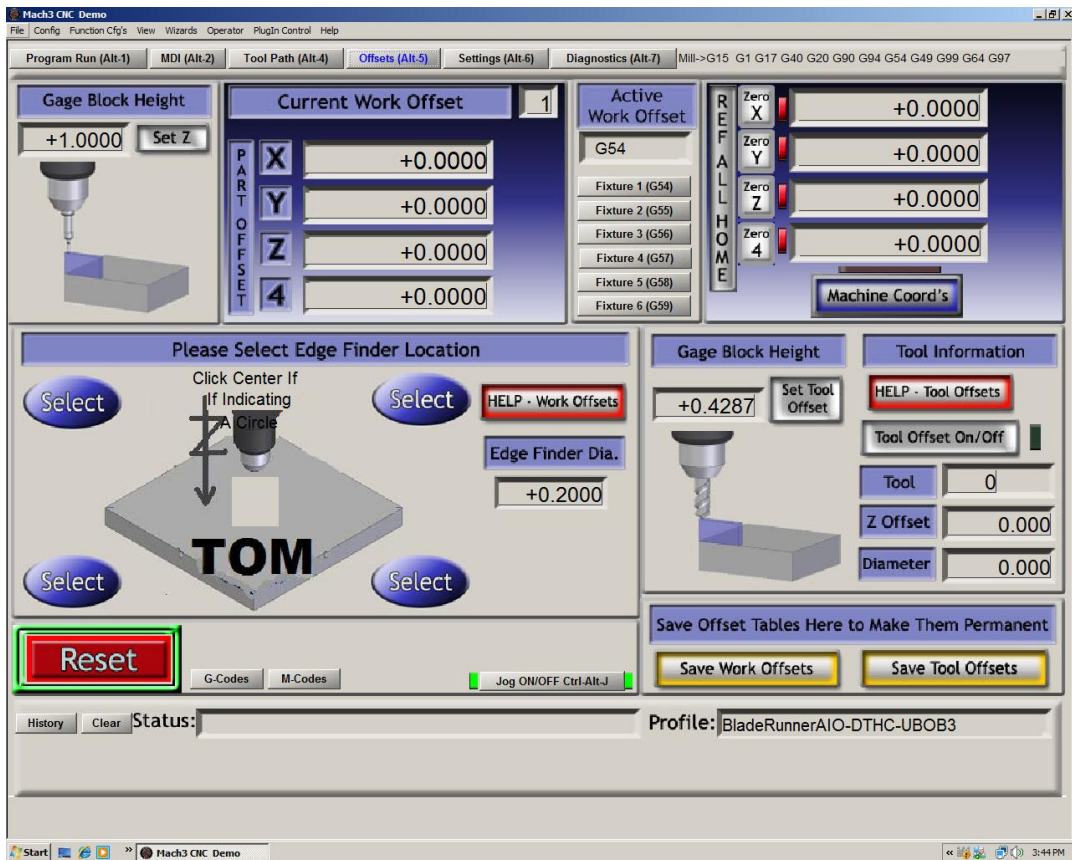
Mach3 Screen References Configuration Windows

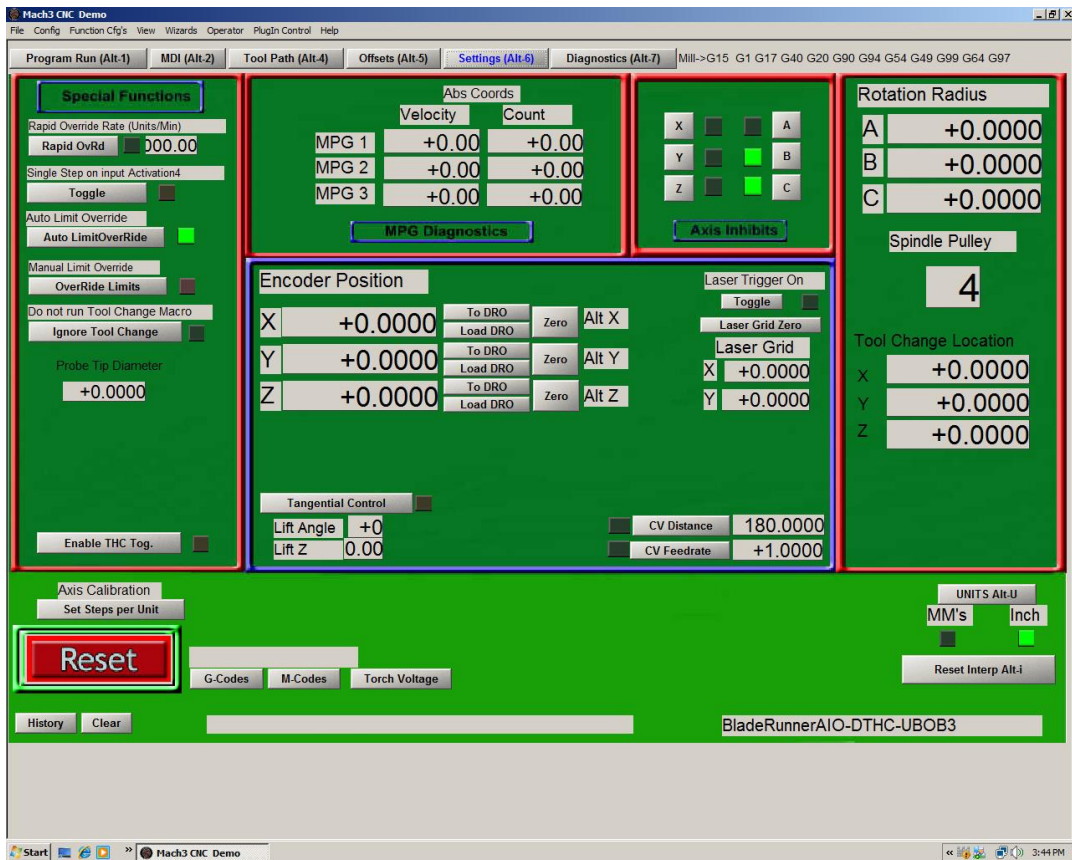


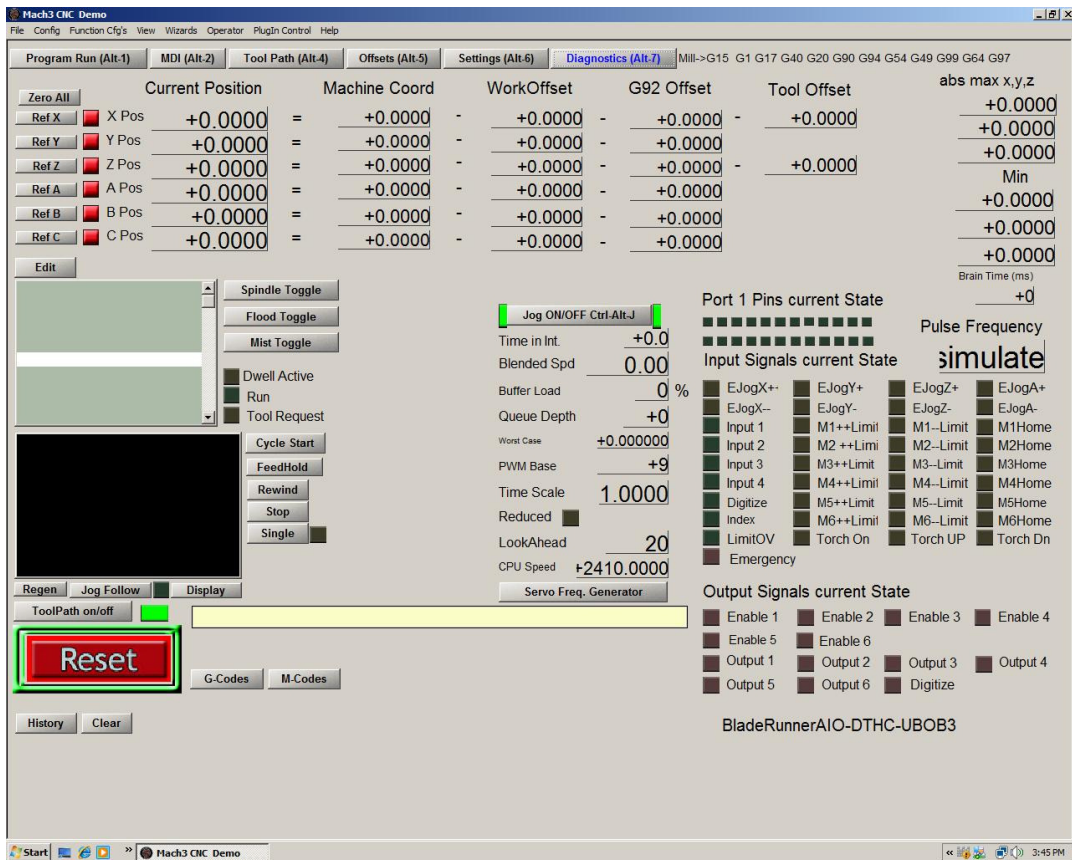












Engine Configuration... Ports & Pins

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

OK Cancel Apply

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 LowActive	Step Low Ac...	Step Port	Dir Port
X Axis		2	3			1	1
Y Axis		4	5			1	1
Z Axis		6	7			1	1
A Axis		8	9			1	1
B Axis		14	16			2	2
C Axis		0	0			0	0
Spindle		1	16			2	2

OK Cancel Apply

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
X ++		8	11			0
X --		8	11			0
X Home		1	11			0
Y ++		0	0			0
Y --		0	0			0
Y Home		1	12			0
Z ++		0	0			0
Z --		0	10			0
Z Home		1	13			0
A ++		0	0			0
A --		0	0			0

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

Automated Setup of Inputs

OK
Cancel
Apply

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 ++		0	0			0
A --		0	0			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
Input #1		8	13			0
Input #2		0	0			0

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

Automated Setup of Inputs

OK
Cancel
Apply

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
Input #2		0	0			0
Input #3		0	0			0
Input #4		0	0			0
Probe		0	0			80
Index		0	0			0
Limit Ovrd		0	0			0
EStop		1	10			0
THC On		8	12			79
THC Up		8	13			85
THC Down		8	15			68
OEM Trin #1		2	3			0

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

Automated Setup of Inputs

OK Cancel Apply

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
THC Down		8	15			68
OEM Trig #1		2	3			0
OEM Trig #2		2	4			0
OEM Trig #3		2	5			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
OEM Trig #8		0	0			0
OEM Trig #9		0	0			0
OEM Trig #10		2	13			0

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

Automated Setup of Inputs

OK Cancel Apply

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
OEM Trig #10		2	13			0
OEM Trig #11		2	10			0
OEM Trig #12		2	9			0
OEM Trig #13		2	15			0
OEM Trig #14		2	11			0
OEM Trig #15		2	12			0
Timing		0	0			0
Jog X++		0	0			0
Jog X--		0	0			0
Jog Y++		0	0			0
Jog Y--		0	0			0

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

Automated Setup of Inputs

OK Cancel Apply

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
OEM Trig #15		2	12			0
Timing		0	0			0
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

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

Automated Setup of Inputs

OK
Cancel
Apply

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
Digit Trig		0	0	
Enable1		0	0	
Enable2		0	0	
Enable3		0	0	
Enable4		0	0	
Enable5		1	0	
Enable6		0	0	
Output #1		4	8	
Output #2		4	3	
Output #3		4	4	
Output #4		4	2	

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

OK Cancel Apply

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/Unit	Velocity
Encoder 1		0	0	0	0	128.000000	100.000000
Encoder 2		0	0	0	0	1.000000	100.000000
Encoder 3		0	0	0	0	1.000000	100.000000
Encoder 4		0	0	0	0	1.000000	100.000000
MPG #1		0	0	0	0	128.000000	110.000000
MPG #2		0	0	0	0	1.000000	100.000000
MPG #3		0	0	0	0	1.000000	100.000000

OK Cancel Apply

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

Mist M7 Output # Delay

Flood M8 Output # Delay

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

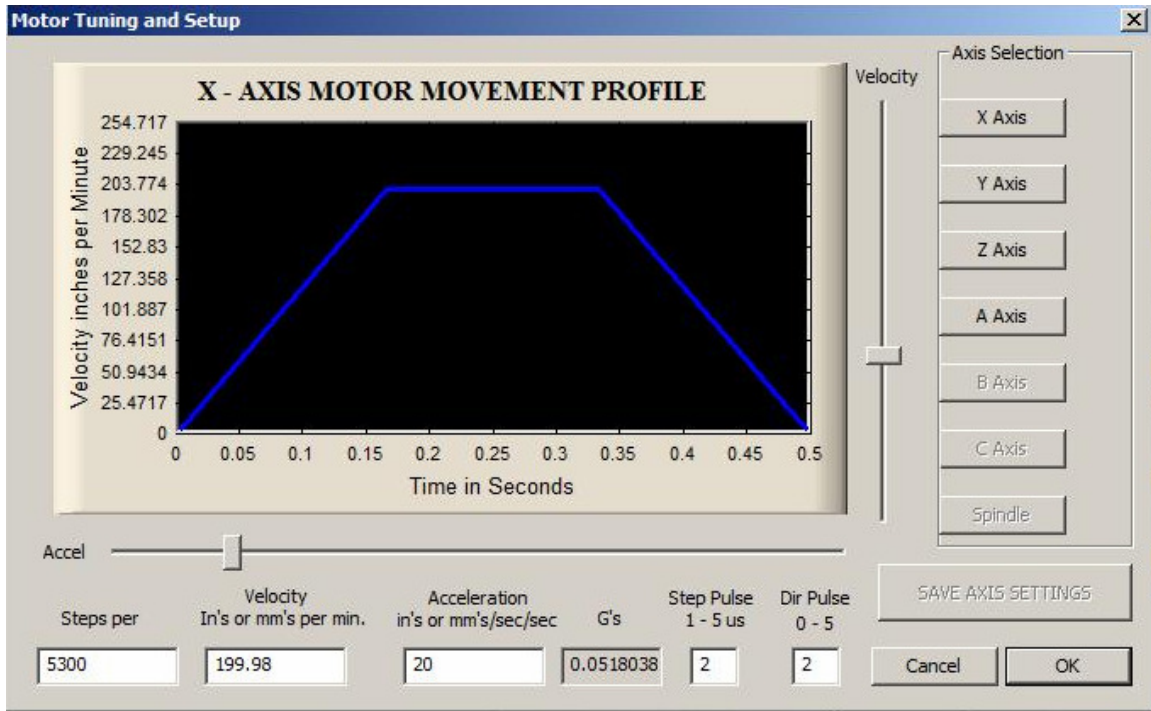
☐ Torch Auto Off

ModBus Spindle - Use Step/Dir as well

☐ Enabled Reg 64 - 127

Max ADC Count

OK Cancel Apply



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 G92.1
☒ Remove Tool Offset
☒ Radius Comp Off
☒ Turn Off Spindle

M01 Control

☒ Stop on M1 Command

Serial Output

ComPort # BaudRate

☒ 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

Startup Modals

☐ Use Init String on ALL "Resets"

Initialization String

Motion Mode

☒ Constant Velocity ☐ Exact Stop

Distance Mode

☒ Absolute ☐ Inc

IJ Mode

☐ Absolute ☒ Inc

Active Plane of Movement

☒ X-Y ☐ Y-Z ☐ X-Z

Jog Increments in Cycle Mode

Position 1	<input type="text" value="1"/>
	<input type="text" value="0.1"/>
	<input type="text" value="0.01"/>
	<input type="text" value="0.001"/>
	<input type="text" value="0.0001"/>
	<input type="text" value="1"/>
	<input type="text" value="0.1"/>
	<input type="text" value="0.01"/>
	<input type="text" value="0.001"/>
	<input type="text" value="0.0001"/>
Position 10	<input type="text" value="0.0001"/>

Use 999 to indicate a Continuous Jog selection.

Shuttle Wheel Setting

Shuttle Accel. Seconds

General Configuration

☐ Z is 2.5D on Output #6
☒ Home Sw. Safety
☐ LookAhead 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 TLO in Z from G31
☒ Lock Rapid FR0 to Feed FR0

☐ Disable Gauge/Concavity Checks
☐ G04 Dwell in ms
☒ Use WatchDogs
☐ Debug This Run
☒ Enhanced Pulsing
☐ Allow Wave Files
☐ Allow Speech
☐ Set Charge Pump to 5Khz - Laser Standby
☐ Use OUTPUT20 as Dwell Trigger
☐ No FR0 on Queue
 Turn Manual Spindle Incr.
 Spindle OV increment

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 x 40us
 Index Debounce

CV Control

☐ Plasma Mode
☐ CV Dist Tolerance Units..
☐ G100 Adaptive NurbsCV
☐ Stop CV on angles > Degrees

Axis DRO Properties

☐ Tool Selections Persistent.
☐ Optional Offset Save
☐ Persistent Offsets
☐ Persistent DROs
☐ Copy G54 from G59,253 on startup

System HotKeys Setup

Jog Hotkeys

	ScanCode		ScanCode
X++	39	X--	37
Y++	38	Y--	40
Z++	33	Z--	34
A / U ++	107	A / U --	109
B / V ++	190	B / V --	188
C / W ++	999	C / W --	999

System Hotkeys

	ScanCode		ScanCode
DRO Select	999	Code List	999
MDI Select	999	Reset On	999
Load G-Code	999		



















External Buttons - OEM Codes

Trigger #	OEM Code		OEM Code
1	-1	8	-1
2	-1	9	-1
3	-1	10	-1
4	-1	11	-1
5	-1	12	-1
6	-1	13	-1
7	-1	14	-1
		15	-1

OK

Motor Home/SoftLimits

Entries are in setup units.

Axis	Reversed	Soft Max	Soft Min	Slow Zone	Home Off.	Home Neg	Auto Zero	Speed %
X		60.00	0.00	1.00	0.0000			20
Y		99.00	0.00	1.00	0.0000			20
Z		6.00	0.00	0.50	0.0000			20
A		99.00	0.00	1.00	0.0000			20
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

A

Y

B

Z

C

OK

ToolPath Configuration [X]

☐ Origin Sphere
☐ 3d Compass
☐ Machine Boundaries
☒ Tool Position
☐ Jog Follow Mode
☒ Show Tool in Z Bar

Rotations
 Axis of Rotation: ☒ X-Axis ☐ Y-Axis ☐ Z-Axis
☐ A- Rotations Enabled
☐ Use Radius for Feedrate

Colors

	Red	Green	Blue
BackGround Color	0	0	0
Rapid Color	1	0	0
Feedrate G1 color	0	0	1
G2,G3 Color	0.7	0.2	0.7
Enhance Color	1	1	0
Material Colour	0	0.1	0.1

Colors range from 0 (none) to 1

☒ Show Tool as above centerline in Turn
☐ Show Lathe Object
 Stock Size: Units
 Auto
☐ Reset Plane on Regen.
☐ Lines from Last to Current

OK

Slave Axis Selection [X]

X Axis

Slaved Axis

☐ A Axis

☐ B Axis

☐ C Axis

☒ None

Y Axis

Slaved Axis

☐ A Axis

☐ B Axis

☐ C Axis

☒ None

Z Axis

Slaved Axis

☐ A Axis

☐ B Axis

☐ C Axis

☒ None

Backlash Values [X]

Backlash Distance in units

X Axis

Y Axis

Z Axis

A Axis

B Axis

C Axis

Backlash Speed % of Max

☐ Backlash Enabled

Restart program to save these settings

Work Offsets

Work Offsets

G-Code Pos	X	Y	Z	A	B	C	Name
G54	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	G54
G55	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	
G56	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	
G57	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	
G58	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	
G59	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	
G59P7	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	
G59P8	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	

Select

Save

Close

Work Offsets

Work Offsets







G-Code Pos	X	Y	Z	A	B	C	Name
G59P246	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	
G59P247	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	
G59P248	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	
G59P249	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	
G59P250	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	
G59P251	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	
G59P252	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	
G59P253	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	

Select

Save

Close

ToolTable






Tool	Description	Diameter(D)	Height (H)	Diam. Wear	HeightWear
0	Ref. Tool	0.000000	0.000000	0.000000	0.000000
 1	Empty	121.000000	0.000000	0.000000	0.000000
 2	Empty	102.000000	202.000000	88.000000	0.000000
 3	Empty	103.000000	203.000000	88.000000	0.000000
 4	Empty	0.000000	0.000000	0.000000	0.000000
 5	Empty	0.000000	0.000000	0.000000	0.000000
					

All Tool Entries are in your default setup measurement units regardless of G20/G1 modes.

Apply

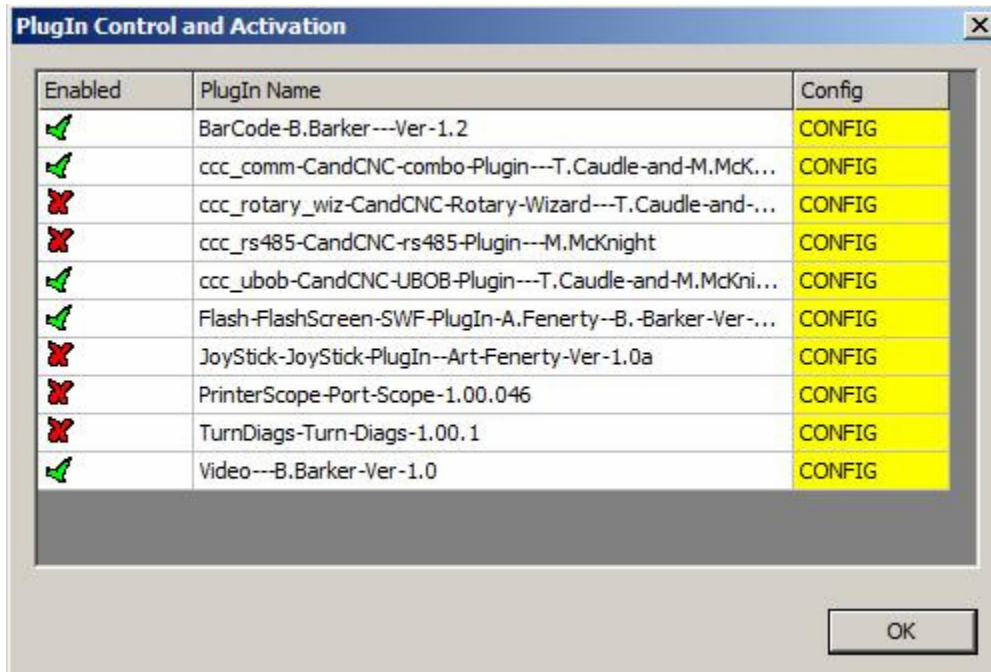
OK

ToolTable

Tool	Description	Diameter(D)	Height (H)	Diam. Wear	HeightWear
0	Ref. Tool	0.000000	0.000000	0.000000	0.000000
 249	Empty	0.000000	0.000000	0.000000	0.000000
 250	Empty	0.000000	0.000000	0.000000	0.000000
 251	Empty	0.000000	0.000000	0.000000	0.000000
 252	Empty	0.000000	0.000000	0.000000	0.000000
 253	Empty	0.000000	0.000000	0.000000	0.000000

All Tool Entries are in your default setup measurement units irregardless of G20/G1 modes.

Apply
OK



Pulley Selection [X]

Current Pulley	Min Speed	Max Speed	Ratio
Pulley Number 4 ▼	0	256	1

☐ Reversed

OK

A screenshot of a 'Global Settings' dialog box. The dialog has a title bar with a close button (X). It contains two sections: 'Global Settings' and 'Optional'. In the 'Global Settings' section, there is a checkbox for 'Allow Safe_Z Moves' which is unchecked. Below it are three radio buttons: 'SafeZ DRO is in Machine Coordinates' (selected), 'SafeZ DRO is in Work Coordinates', and 'SafeZ is an incremental Rise'. Below the radio buttons is a text input field labeled 'Safe_Z' containing the value '0.5'. The 'Optional' section contains a checkbox for 'Goto SafeZ when Stop button is hit.' which is unchecked. An 'OK' button is located at the bottom right of the dialog.

Global Settings

☐ Allow Safe_Z Moves

☒ SafeZ DRO is in Machine Coordinates

☐ SafeZ DRO is in Work Coordinates

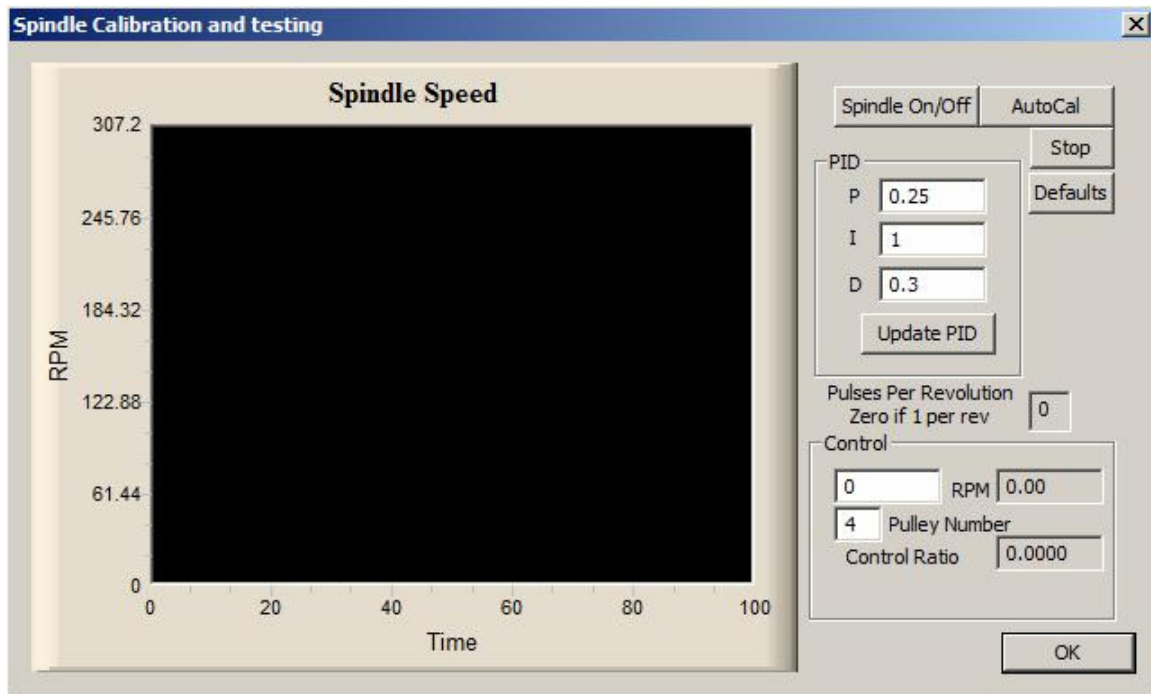
☐ SafeZ is an incremental Rise

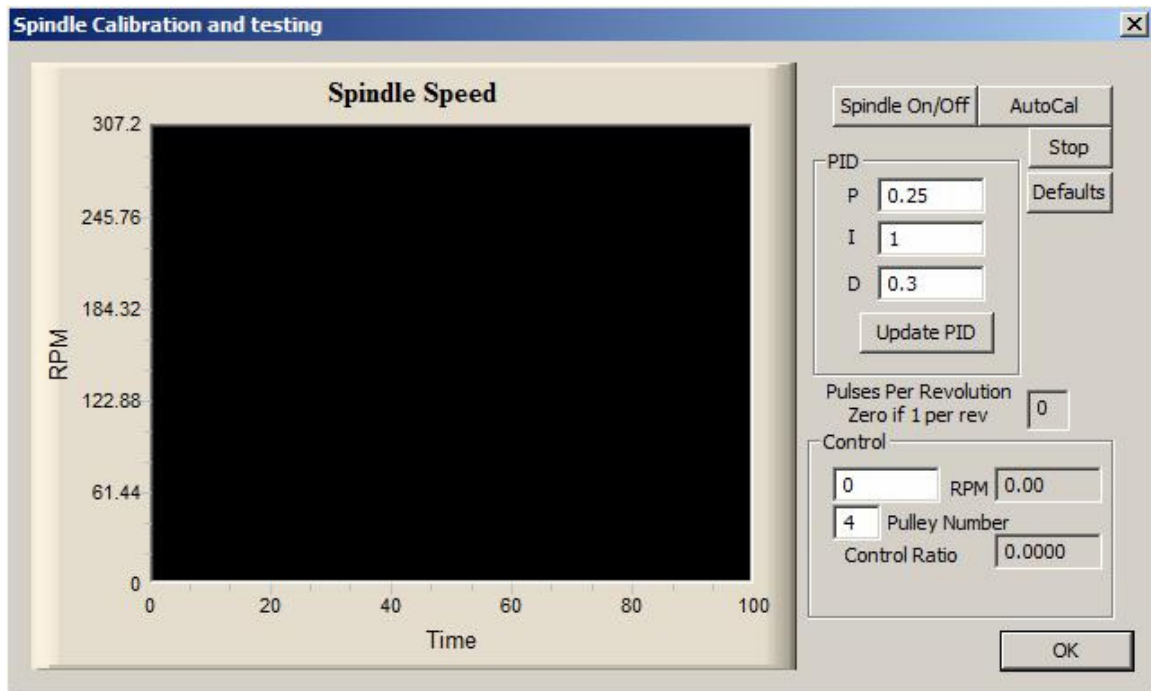
Safe_Z

Optional

☐ Goto SafeZ when Stop button is hit.

OK





Serial Monitor

Live Serial Traffic

Serial Initialized

History

ReConnect/Save changes

Serial Port

Baud Rate

Parity ☐ None ☒ Odd ☐ Even

Data Bits ☐ 7 ☒ 8

Init String

Start Data Command

Command Delineator
☒ CR
☐ Use Char

☐ SLS-5000 Laser Mode

Calibration of MPG's ✕

Cal Sequence

☒ MPG#1 ☐ MPG#2 ☐ MPG #3

Cal Detent Size Counts / Detent

Cal Max Speed Max Speed Detents/sec -----> Calculate

Cal Step/Vel Trans. Step/Velocity Switchover

Save OK

Screw Mapping Corrections

☒ X-Mapping

Clear Map

☐ Y-Mapping

Clear Map

☐ Z-Mapping

Clear Map

☐ A-Mapping

Clear Map

Screw Lengths

1300

1300

1300

0

ScrewMap Correction Enable

☐ X - Axis Correction

☐ Y - Axis Correction

☐ Z - Axis Correction

☐ A - Axis Correction

True Position

X - Coor

0

Y - Coor

0

Z - Coor

0

A - Coor

0

Read from Encoders

Add Correction Point

Program Position

X - Coor

+0.000

Y - Coor

+0.000

Z - Coor

+0.000

A - Coor

+0.000

Save Curves

OK

Screw Mapping Correction Curve

Correction

0.5

0.3

0.1

-0.1

-0.3

-0.5

Distance % of total length

0

20

40

60

80

100

TCP Modbus Setup

☐ TCP Modbus Run

192 . 168 . 2 . 44 Master Address

Test

Static

	Enabled On/Off	Comment or Device	Refresh 25ms Incr.	Slave # 0-10	# of Registers	Address Local(Var)	Address ModBus(Var)	Direction Input Output
Cfg #0	<input type="checkbox"/>							
Cfg #1	<input type="checkbox"/>							
Cfg #2	<input type="checkbox"/>							
Cfg #3	<input type="checkbox"/>							
Cfg #4	<input type="checkbox"/>							
Cfg #5	<input type="checkbox"/>							
Cfg #6	<input type="checkbox"/>							
Cfg #7	<input type="checkbox"/>							
Cfg #8	<input type="checkbox"/>							
Cfg #9	<input type="checkbox"/>							
Cfg #10	<input type="checkbox"/>							
Cfg #11	<input type="checkbox"/>							
Cfg #12	<input type="checkbox"/>							
Cfg #13	<input type="checkbox"/>							
Cfg #14	<input type="checkbox"/>							
Cfg #15	<input type="checkbox"/>							
Cfg #16	<input type="checkbox"/>							
Cfg #17	<input type="checkbox"/>							

Apply

OK

Formula Axis Correction

☐ Formulas Enabled

f(x) =

Test

f(y) =

Test

f(z) =

Test

f(a) =

Test

f(b) =

Test

f(c) =

Test

Available variables are axis letters X,Y,Z,A,B,C and the current tool diameter D and length T

You may also use math function such as Sin, Cos, Tan, PI, etc..

Sample Formula: $f(x) = \sin(y) * \cos(x) + \text{PI}^2 - (\cos(b) + \sin(a) - t * (\cos(d)))$

Test Variable settings

X

Y

Z

D

A

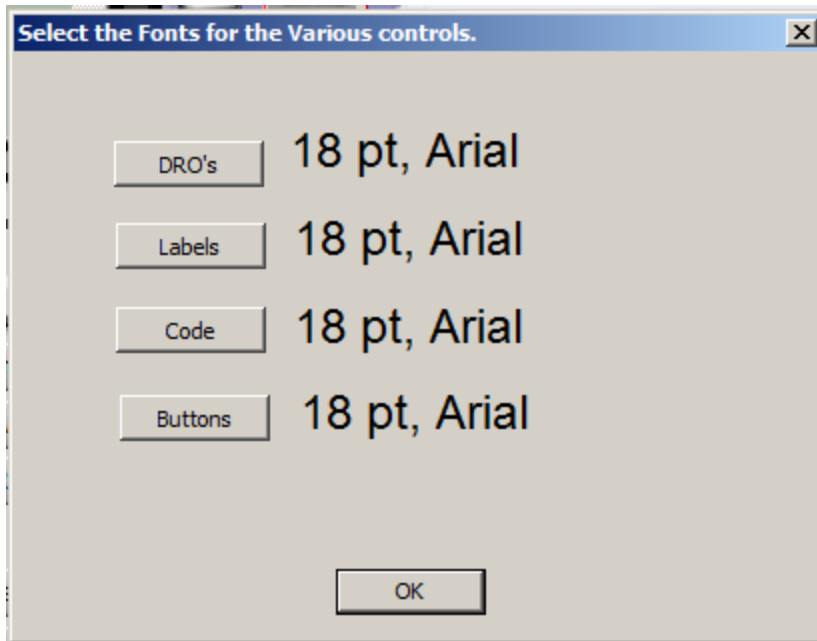
B

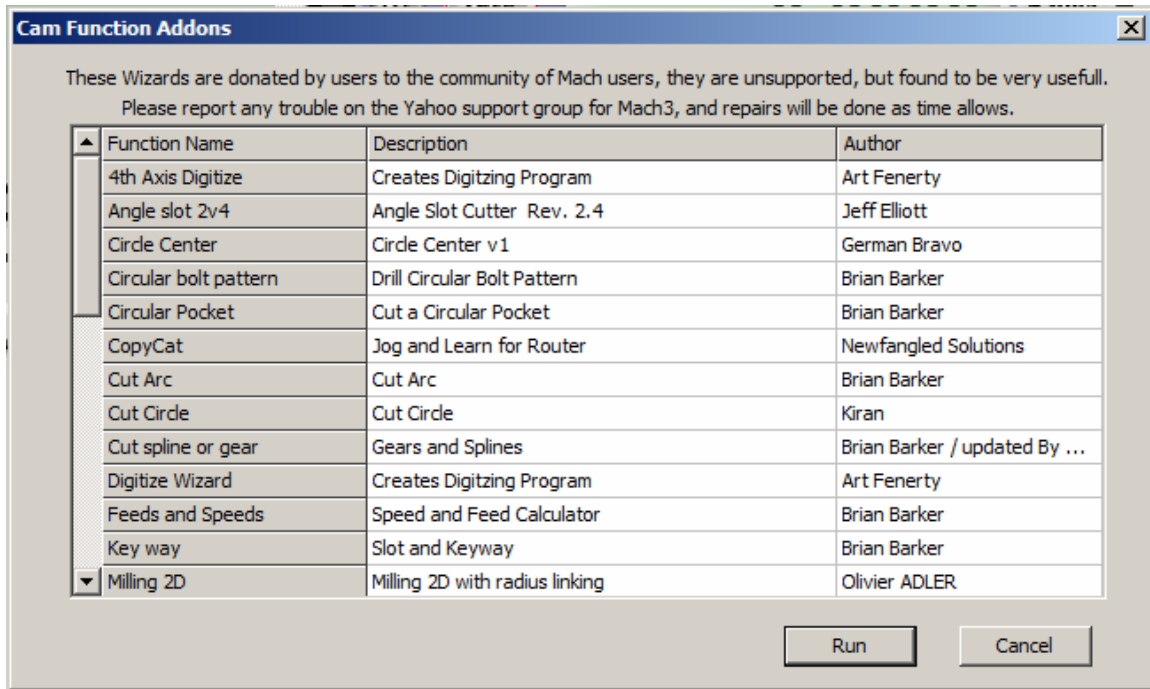
C

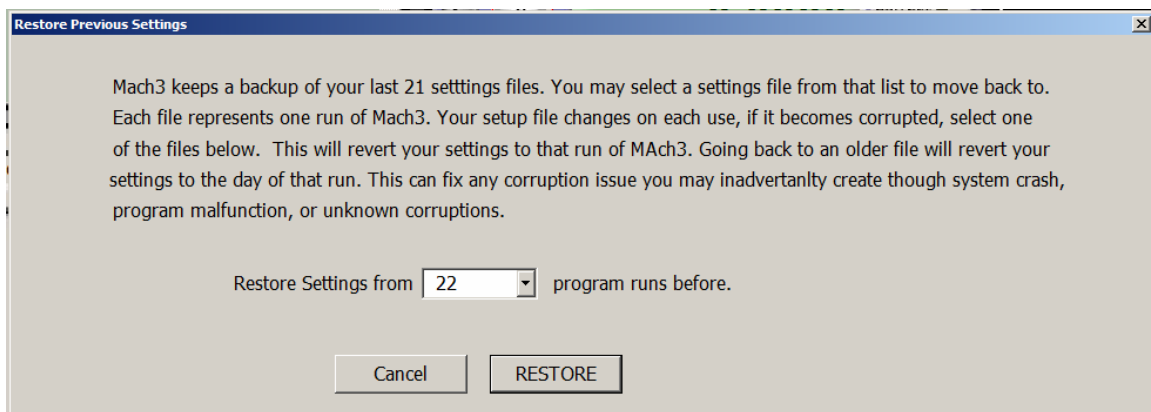
T

TestResult:

OK







Maintenance Statistics

Total Distance

X

4900

Y

3000

Z

1000

A

0.3

B

0

C

0

Units

This Session

0.17

Hours

Total Operating Time

7214.78

Hours

Spindle On Time Hrs:

0

M3's

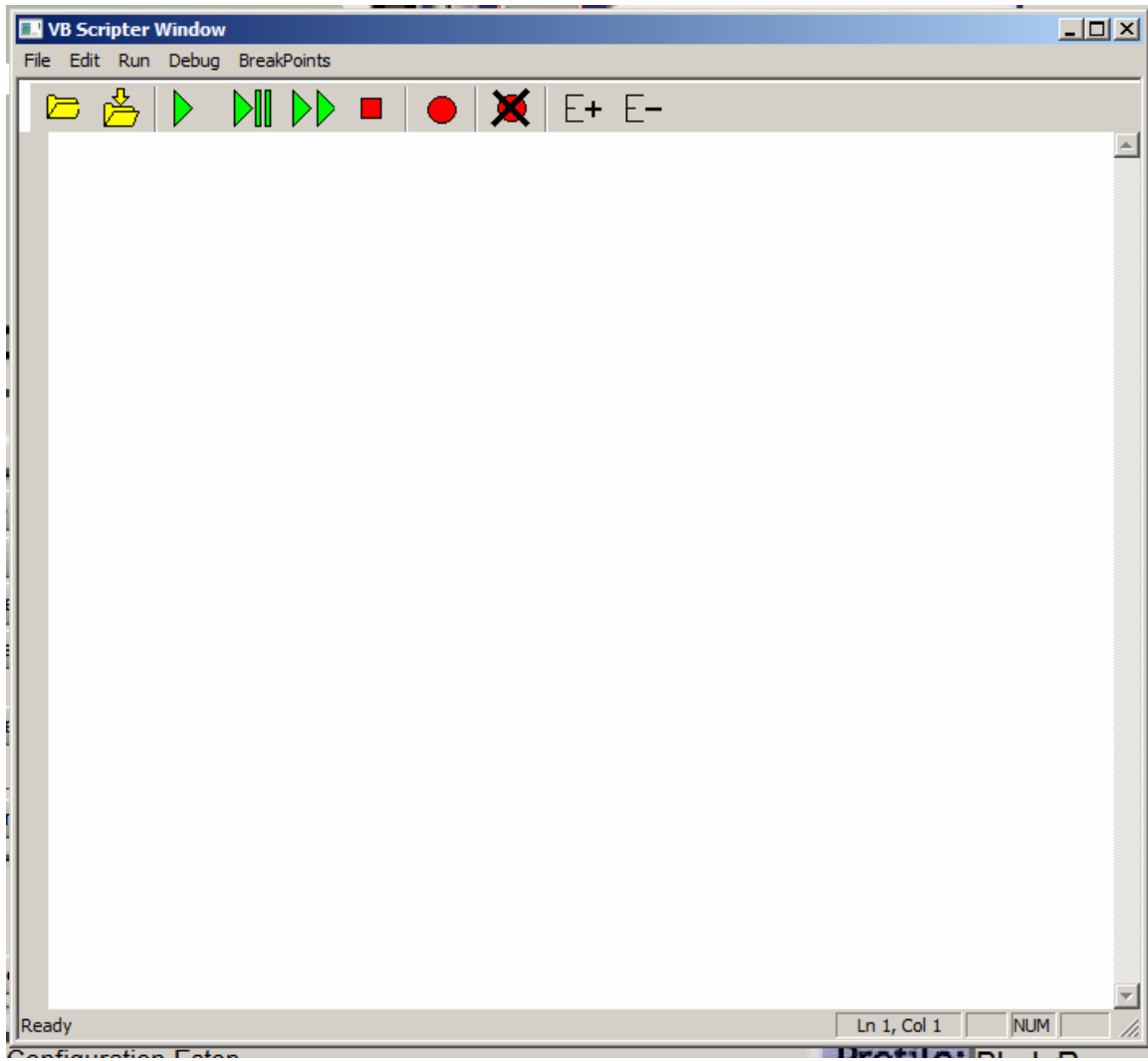
7212

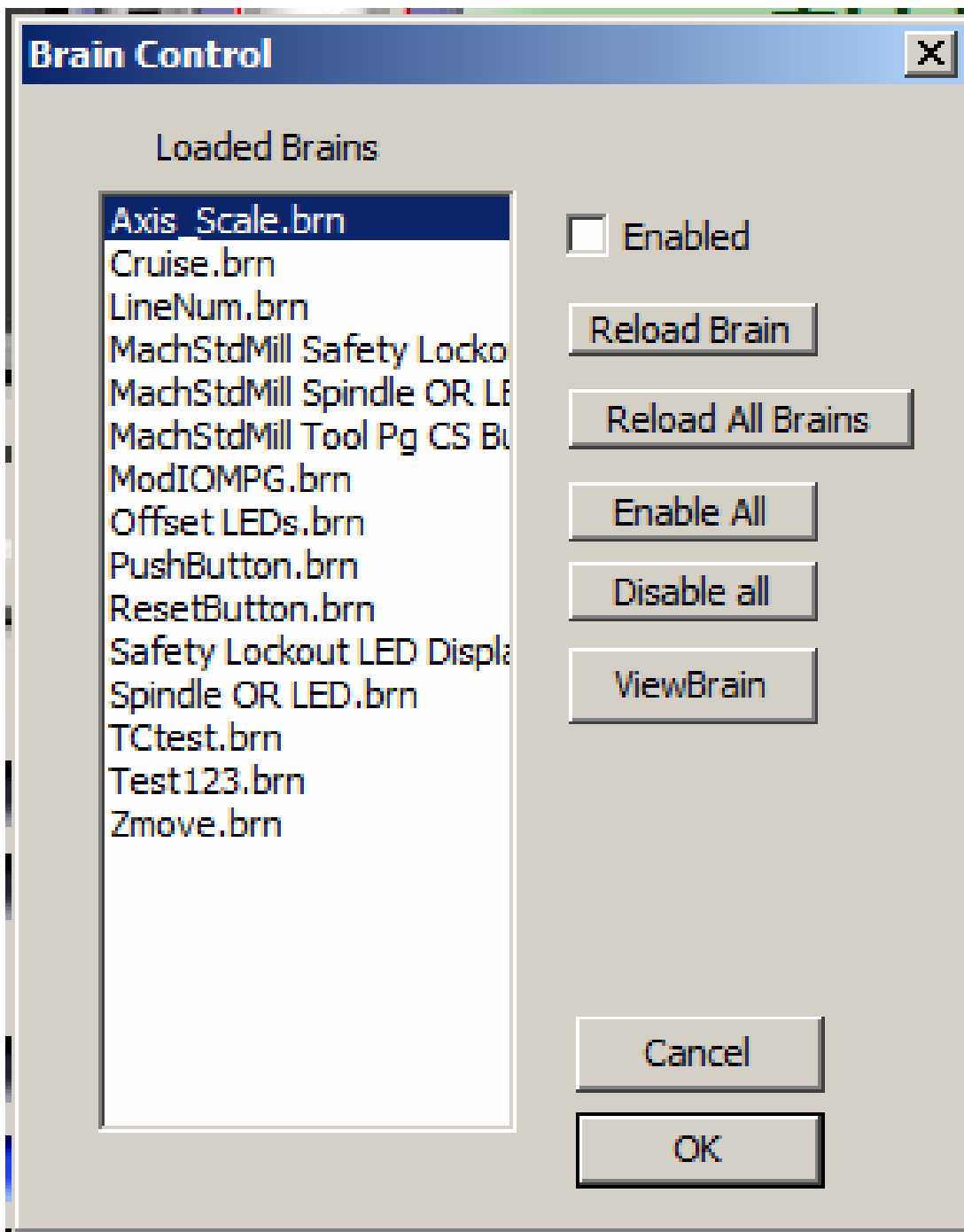
RST

Reset All

OK

44





VarCheck Diagnostic

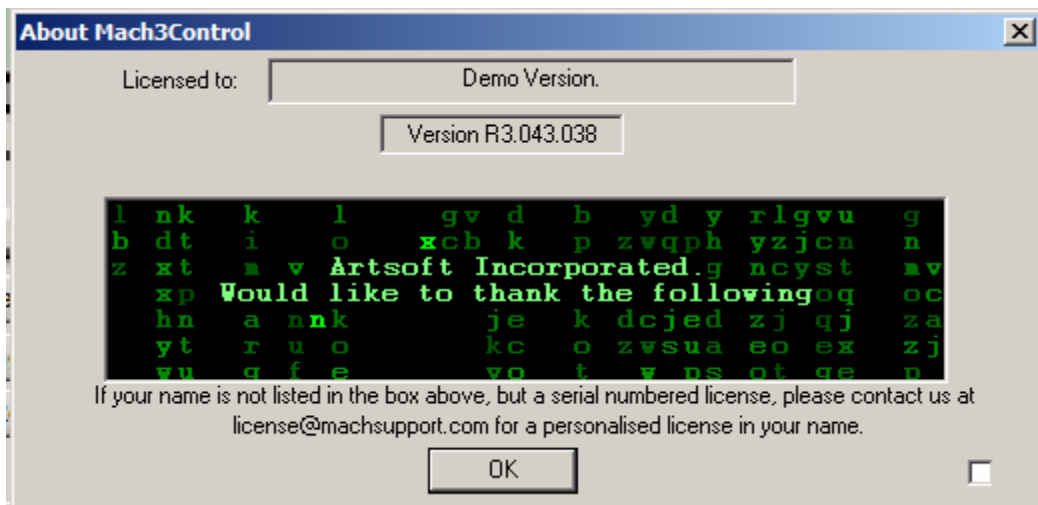
X

GCode Variable Monitor

Var Adress	Stored Value
0	0
1	0
2	0
3	0
4	0

Update

OK



Send Bug Report. [X]

This facility will send the Author a bug report. You may, or may not receive a reply,
but the bug will be analysed as time permits and contributes to making Mach3
a more stable and robust system for all users.
Follow up with ArtSoft for questions regarding outcome of the analysis.

Subject:

Description:

☐ Include Mach3Mill.xml file
☐ Include Mach3Turn.xml
☐ Include Current GCode program

OK
Cancel

