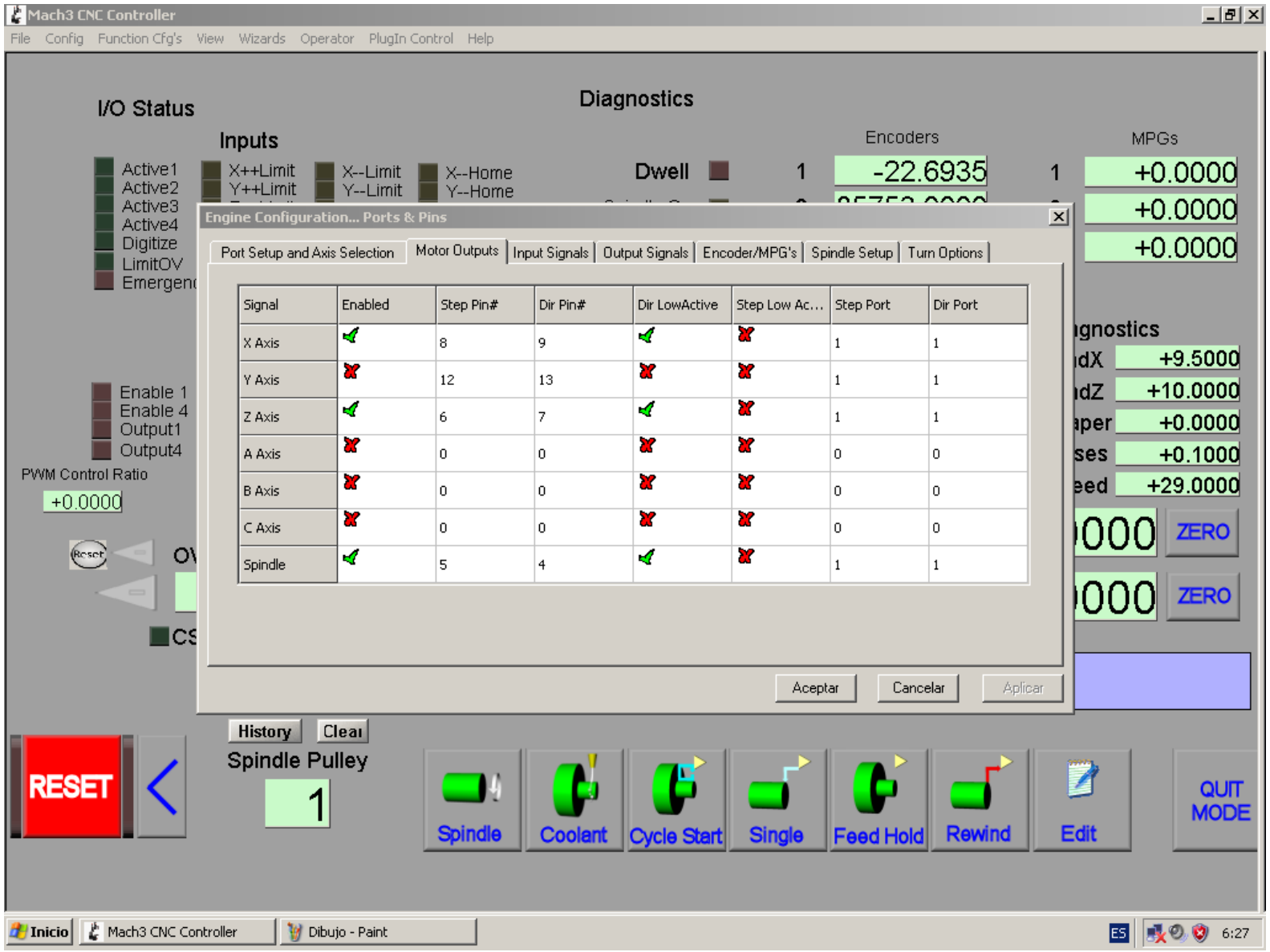
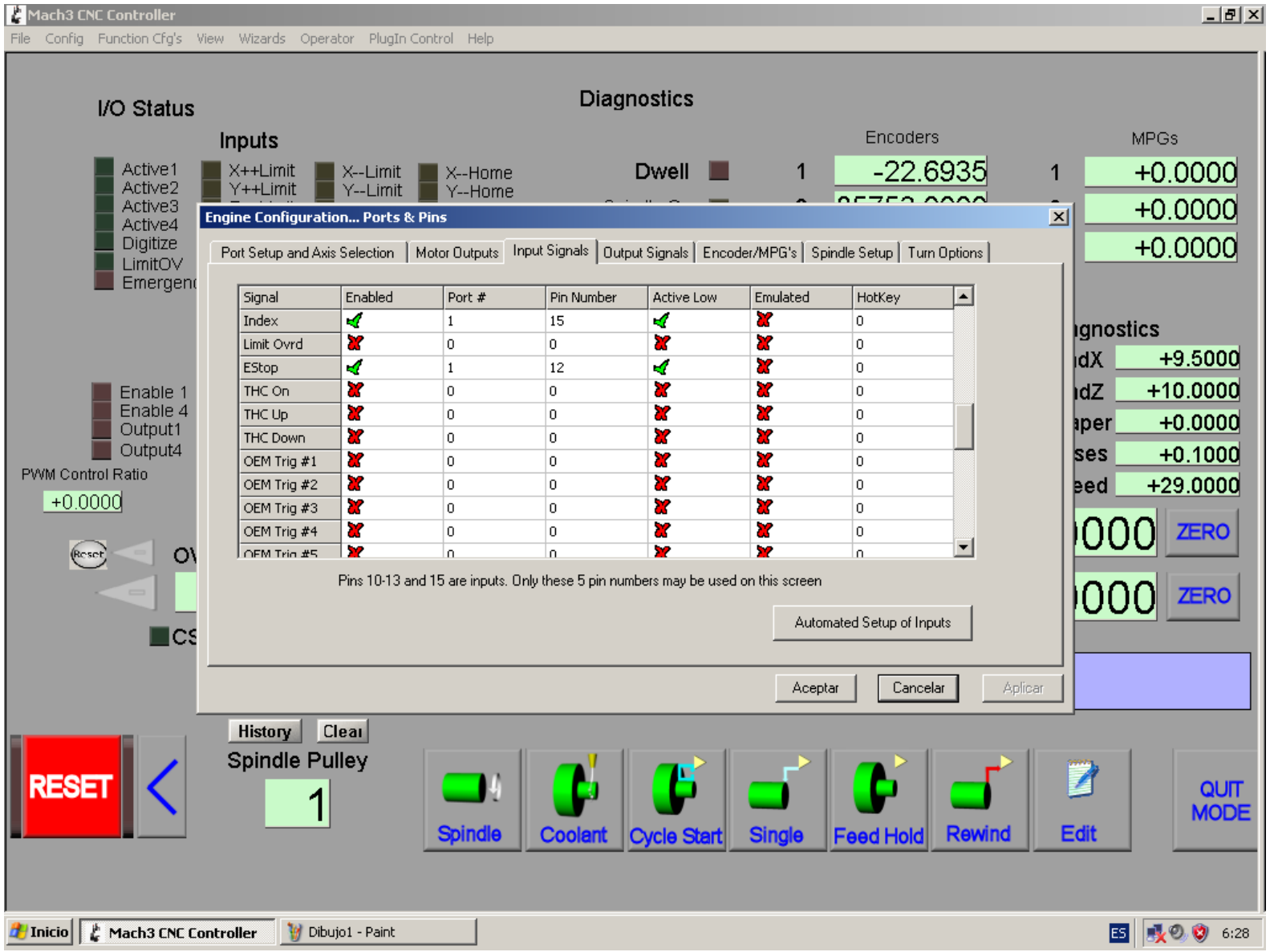
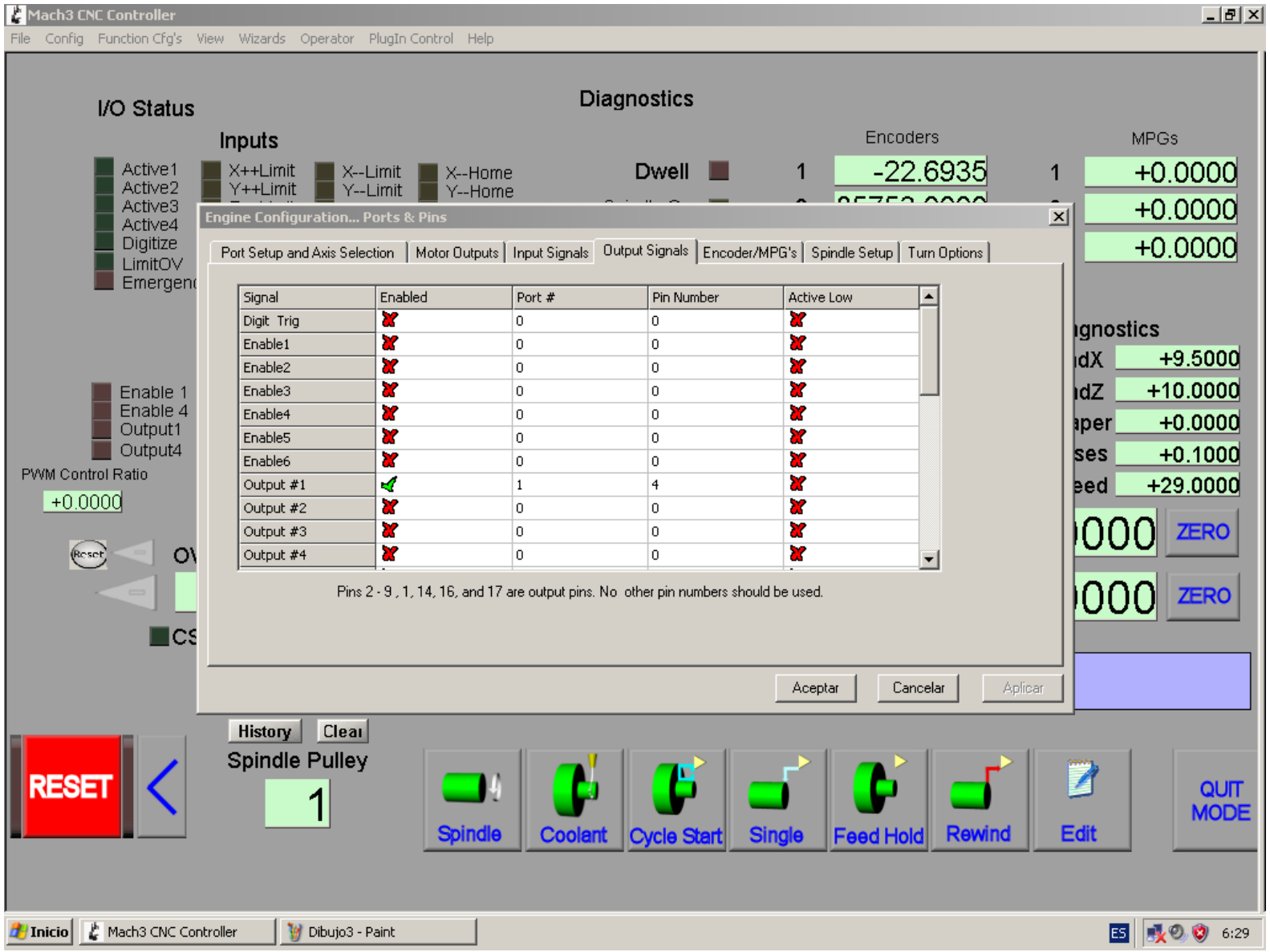
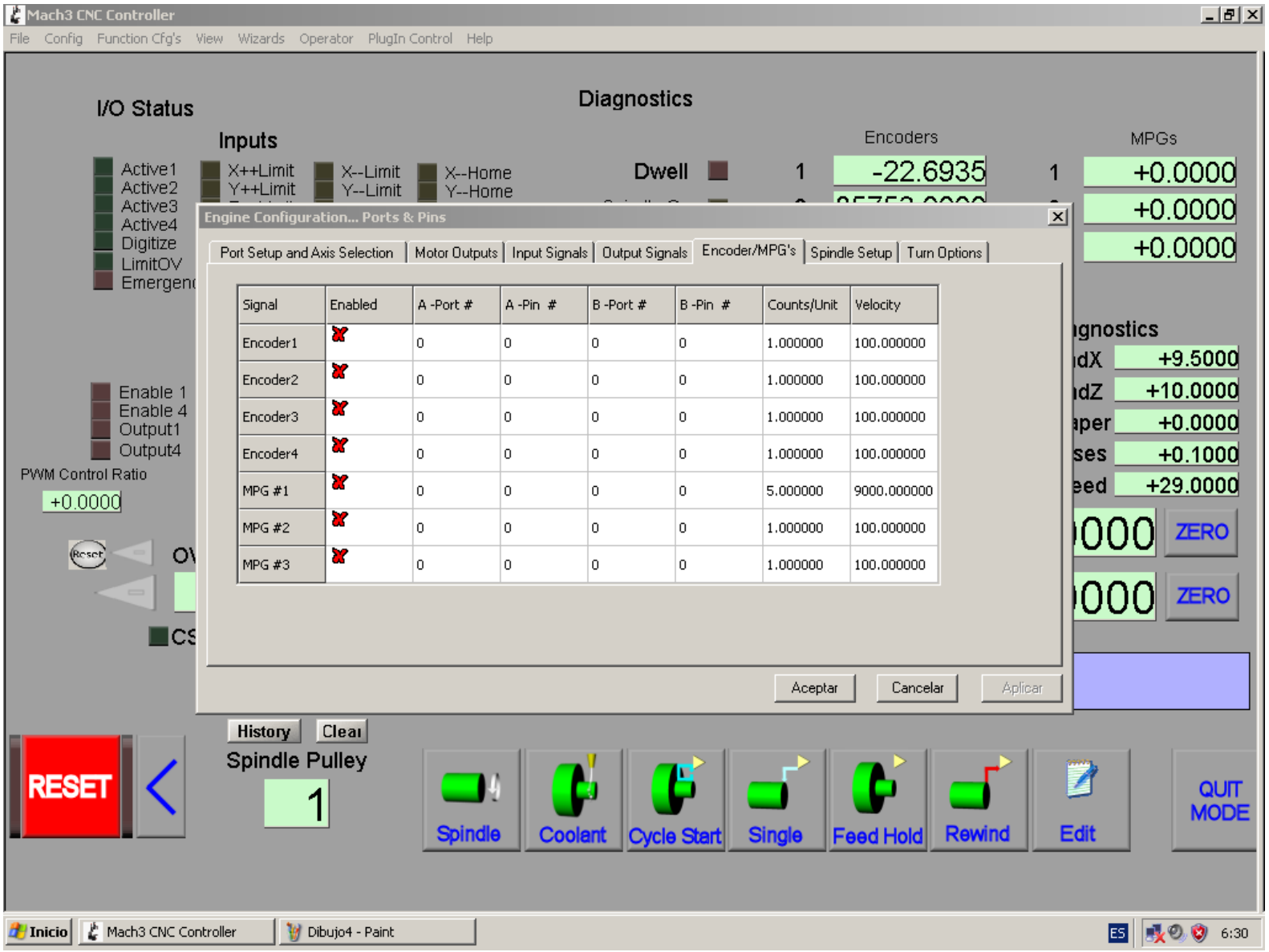

Mach3 CNC Controller
File Config Function Cfg's View Wizards Operator PlugIn Control Help
I/O Status
Inputs
Active1
Active2
Active3
Active4
Digitize
LimitOV
X++Limit
Y++Limit
X--Limit
Y--Limit
X--Home
Y--Home
Diagnostics
Dwell
Encoders
MPGs
-22.6935
+0.0000
+0.0000
+0.0000
Engine Configuration... Ports & Pins
Port Setup and Axis Selection
Motor Outputs
Input Signals
Output Signals
Encoder/MPG's
Spindle Setup
Turn Options
Signal | Enabled | Step Pin# | Dir Pin# | Dir LowActive | Step Low Ac... | Step Port | Dir Port
X Axis | 8 | 9 | 1 | 1
Y Axis | 12 | 13 | 1 | 1
Z Axis | 6 | 7 | 1 | 1
A Axis | 0 | 0 | 0 | 0
B Axis | 0 | 0 | 0 | 0
C Axis | 0 | 0 | 0 | 0
Spindle | 5 | 4 | 1 | 1
Aceptar
Cancelar
Aplicar
Enable 1
Enable 4
Output1
Output4
PWM Control Ratio
+0.0000
+9.5000
+10.0000
+0.0000
+0.1000
+29.0000
ZERO
ZERO
History
Clear
Spindle Pulley
1
RESET
Spindle
Coolant
Cycle Start
Single
Feed Hold
Rewind
Edit
QUIT MODE
Inicio
Mach3 CNC Controller
Dibujo - Paint
ES
6:27


Mach3 CNC Controller
File Config Function Cfg's View Wizards Operator PlugIn Control Help
I/O Status
Inputs
Active1
Active2
Active3
Active4
Digitize
LimitOV
X++Limit
Y++Limit
X--Limit
Y--Limit
X--Home
Y--Home
Diagnostics
Dwell
Encoders
MPGs
-22.6935
+0.0000
+0.0000
+0.0000
Engine Configuration... Ports & Pins
Port Setup and Axis Selection
Motor Outputs
Input Signals
Output Signals
Encoder/MPG's
Spindle Setup
Turn Options
Signal | Enabled | Port # | Pin Number | Active Low | Emulated | HotKey
Index | 1 | 15 | 0
Limit Ovrd | 0 | 0 | 0
EStop | 1 | 12 | 0
THC On | 0 | 0 | 0
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
Pins 10-13 and 15 are inputs. Only these 5 pin numbers may be used on this screen
Automated Setup of Inputs
Aceptar
Cancelar
Aplicar
Enable 1
Enable 4
Output1
Output4
PWM Control Ratio
+0.0000
+9.5000
+10.0000
+0.0000
+0.1000
+29.0000
ZERO
ZERO
History
Clear
Spindle Pulley
1
RESET
Spindle
Coolant
Cycle Start
Single
Feed Hold
Rewind
Edit
QUIT MODE
Inicio
Mach3 CNC Controller
Dibujo1 - Paint
ES
6:28


Mach3 CNC Controller
File Config Function Cfg's View Wizards Operator PlugIn Control Help
I/O Status
Inputs
Active1
Active2
Active3
Active4
Digitize
LimitOV
X++Limit
Y++Limit
X--Limit
Y--Limit
X--Home
Y--Home
Diagnostics
Dwell
Encoders
MPGs
-22.6935
+0.0000
+0.0000
+0.0000
Engine Configuration... Ports & Pins
Port Setup and Axis Selection
Motor Outputs
Input Signals
Output Signals
Encoder/MPG's
Spindle Setup
Turn Options
Signal
Enabled
Port #
Pin Number
Active Low
Emulated
HotKey
OEM Trig #15
Timing
Jog X++
Jog X--
Jog Y++
Jog Y--
Jog Z++
Jog Z--
Jog A++
Jog A--
Pins 10-13 and 15 are inputs. Only these 5 pin numbers may be used on this screen
Automated Setup of Inputs
Aceptar
Cancelar
Aplicar
Enable 1
Enable 4
Output1
Output4
PWM Control Ratio
+0.0000
+9.5000
+10.0000
+0.0000
+0.1000
+29.0000
ZERO
ZERO
History
Clear
Spindle Pulley
1
RESET
Spindle
Coolant
Cycle Start
Single
Feed Hold
Rewind
Edit
QUIT MODE
Inicio
Mach3 CNC Controller
Dibujo2 - Paint
ES
6:28


Mach3 CNC Controller
File Config Function Cfg's View Wizards Operator PlugIn Control Help
I/O Status
Inputs
Active1
Active2
Active3
Active4
Digitize
LimitOV
X++Limit
Y++Limit
X--Limit
Y--Limit
X--Home
Y--Home
Diagnostics
Dwell
Encoders
MPGs
-22.6935
+0.0000
+0.0000
+0.0000
Engine Configuration... Ports & Pins
Port Setup and Axis Selection
Motor Outputs
Input Signals
Output Signals
Encoder/MPG's
Spindle Setup
Turn 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 | 0 | 0
Enable6 | 0 | 0
Output #1 | 1 | 4
Output #2 | 0 | 0
Output #3 | 0 | 0
Output #4 | 0 | 0
Pins 2 - 9 , 1, 14, 16, and 17 are output pins. No other pin numbers should be used.
Aceptar
Cancelar
Aplicar
Enable 1
Enable 4
Output1
Output4
PWM Control Ratio
+0.0000
+9.5000
+10.0000
+0.0000
+0.1000
+29.0000
ZERO
ZERO
History
Clear
Spindle Pulley
1
RESET
Spindle
Coolant
Cycle Start
Single
Feed Hold
Rewind
Edit
QUIT MODE
Inicio
Mach3 CNC Controller
Dibujo3 - Paint
ES
6:29


Mach3 CNC Controller
File Config Function Cfg's View Wizards Operator PlugIn Control Help
I/O Status
Inputs
Active1
Active2
Active3
Active4
Digitize
LimitOV
X++Limit
Y++Limit
X--Limit
Y--Limit
X--Home
Y--Home
Diagnostics
Dwell
Encoders
MPGs
-22.6935
+0.0000
+0.0000
+0.0000
Engine Configuration... Ports & Pins
Port Setup and Axis Selection
Motor Outputs
Input Signals
Output Signals
Encoder/MPG's
Spindle Setup
Turn Options
Signal | Enabled | A -Port # | A -Pin # | B -Port # | B -Pin # | Counts/Unit | 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 | 5.000000 | 9000.000000
MPG #2 | 0 | 0 | 0 | 0 | 1.000000 | 100.000000
MPG #3 | 0 | 0 | 0 | 0 | 1.000000 | 100.000000
Aceptar
Cancelar
Aplicar
Enable 1
Enable 4
Output1
Output4
PWM Control Ratio
+0.0000
+9.5000
+10.0000
+0.0000
+0.1000
+29.0000
ZERO
ZERO
History
Clear
Spindle Pulley
1
RESET
Spindle
Coolant
Cycle Start
Single
Feed Hold
Rewind
Edit
QUIT MODE
Inicio
Mach3 CNC Controller
Dibujo4 - Paint
ES
6:30


Mach3 CNC Controller
File Config Function Cfg's View Wizards Operator PlugIn Control Help
I/O Status
Inputs
Active1
Active2
Active3
Active4
Digitize
LimitOV
X++Limit
Y++Limit
X--Limit
Y--Limit
X--Home
Y--Home
Diagnostics
Dwell
Encoders
MPGs
-22.6935
+0.0000
+0.0000
+0.0000
Engine Configuration... Ports & Pins
Port Setup and Axis Selection
Motor Outputs
Input Signals
Output Signals
Encoder/MPG's
Spindle Setup
Turn Options
Relay Control
Disable Spindle Relays
Clockwise (M3) Output # 1
CCW (M4) Output # 2
Output Signal #'s 1-6
Flood Mist Control
Disable Flood/Mist relays
Mist M7 Output # 4
Flood M8 Output # 3
Output Signal #'s 1-6
ModBus Spindle - Use Step/Dir as well
Enabled Reg 64 64 - 127
Max ADC Count 16380
Motor Control
Use Spindle Motor Output
PWM Control
Step/Dir Motor
PWMBase Freq. 150
Minimum PWM 0 %
General Parameters
CW Delay Spin UP 1 Seconds
CCW Delay Spin UP 1 Seconds
CW Delay Spind DOWN 1 Seconds
CCW Delay Spin DOWN 1 Seconds
Immediate Relay off before delay
Special Functions
Use Spindle Feedback in Sync Mode
Closed Loop Spindle Control
P 0.2 I 0.1 D 0.2
Spindle Speed Averaging
Special Options, Usually Off
HotWire Heat for Jog
Laser Mode. freq
Torch Volts Control
Aceptar
Cancelar
Aplicar
Enable 1
Enable 4
Output1
Output4
PWM Control Ratio
+0.0000
Reset
ZERO
ZERO
History
Clear
Spindle Pulley
1
RESET
Spindle
Coolant
Cycle Start
Single
Feed Hold
Rewind
Edit
QUIT MODE
Inicio
Mach3 CNC Controller
Dibujo5 - Paint
ES
6:30

A two-channel Hall effect encoder is used to sense the rotation of a magnetic disk on a rear protrusion of the motor shaft. The quadrature encoder provides a resolution of 64 counts per revolution of the motor shaft when counting both edges of both channels. To compute the counts per revolution of the gearbox output, multiply the gear ratio by 64. The motor/encoder has six color-coded, 11" (28 cm) leads terminated by a 1×6 female header with a 0.1" pitch, as shown in the main product picture. This header works with standard 0.1" male headers and our male jumper and precrimped wires. If this header is not convenient for your application, you can pull the crimped wires out of the header or cut the header off. The following table describes the wire functions:

37D mm metal gearmotor with 64 CPR encoder (with end cap removed).

Color	Function
Red	motor power (connects to one motor terminal)
Black	motor power (connects to the other motor terminal)
Green	encoder GND
Blue	encoder Vcc (3.5 – 20 V)
Yellow	encoder A output
White	encoder B output

The Hall sensor requires an input voltage, Vcc, between 3.5 and 20 V and draws a maximum of 10 mA. The A and B outputs are square waves from 0 V to Vcc approximately 90° out of phase. The frequency of the transitions tells you the speed of the motor, and the order of the transitions tells you the direction. The following oscilloscope capture shows the A and B (yellow and white) encoder outputs using a motor voltage of 12 V and a Hall sensor Vcc of 5 V: