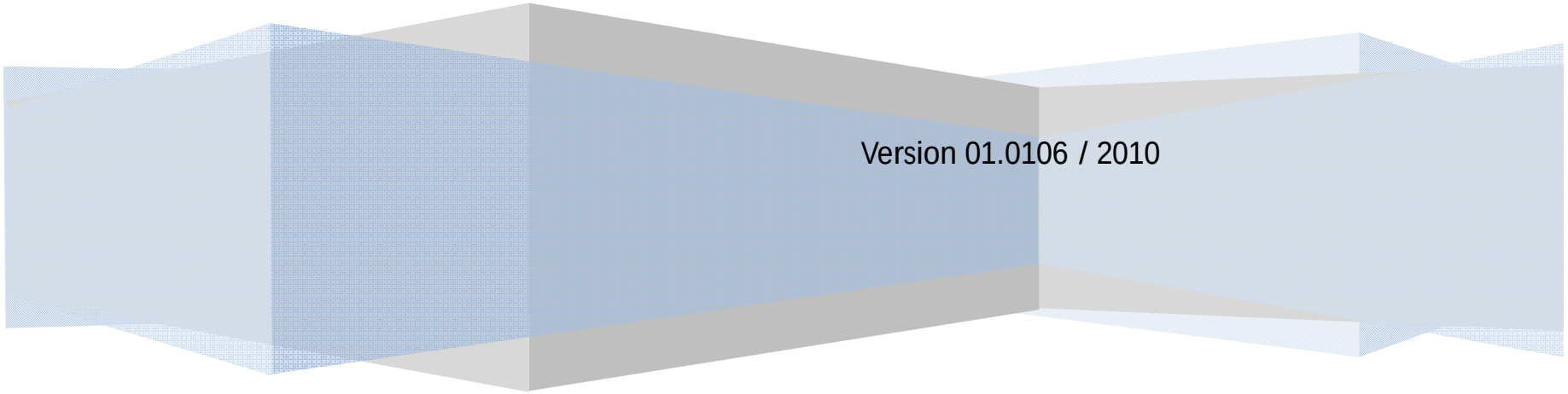
DMM Technology Corp.

[DMB4250-8B BreakOut Board

How to Manual



Version 01.0106 / 2010

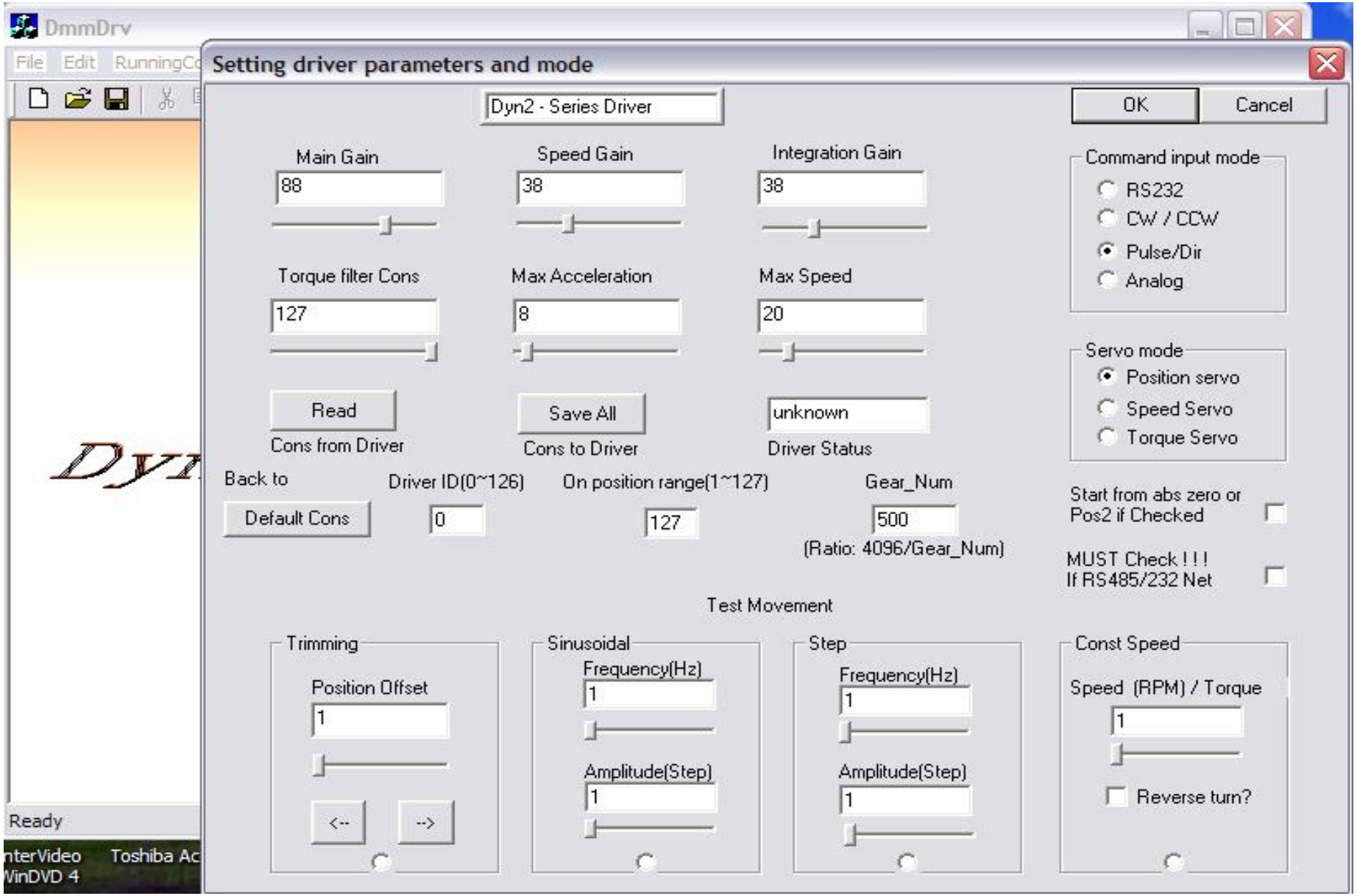
Scope

This manual describes how to use the breakout board DMB4250-8B for Mach3, how to set up Dyn2 Drives, and how to wire up the cables between the breakout board and Dyn2 Drive, also the Home/Limit, ESTOP switches, to realize a Mach3 controlled CNC.

Contents

1. Use DmmDrv.exe to set up Dyn2 servo for Mach3

Suppose the DmmDrv.exe be installed in your PC, if not Please reference the "*How to Use DmmDrv.exe to Tune Up and Test Move Dyn servo*" manual's section 10.0 for these adjustment details.



First, connect your PC with NULL Modem Cable to the Drive's JP2, and then launch the DmmDrv.exe. Select *ServoSetting* and click on *Dyn2-Driver*, the *Setting driver parameters and mode* dialog box will now be selected.

Set all the parameters as shown in above picture.

Command input mode be Pulse/Dir, means the drive accept Step/Dir position command.

On position range be 127, means only when there is drive failure, the Pin5 of JP3 will be high to Inform Mach3 as emergency.

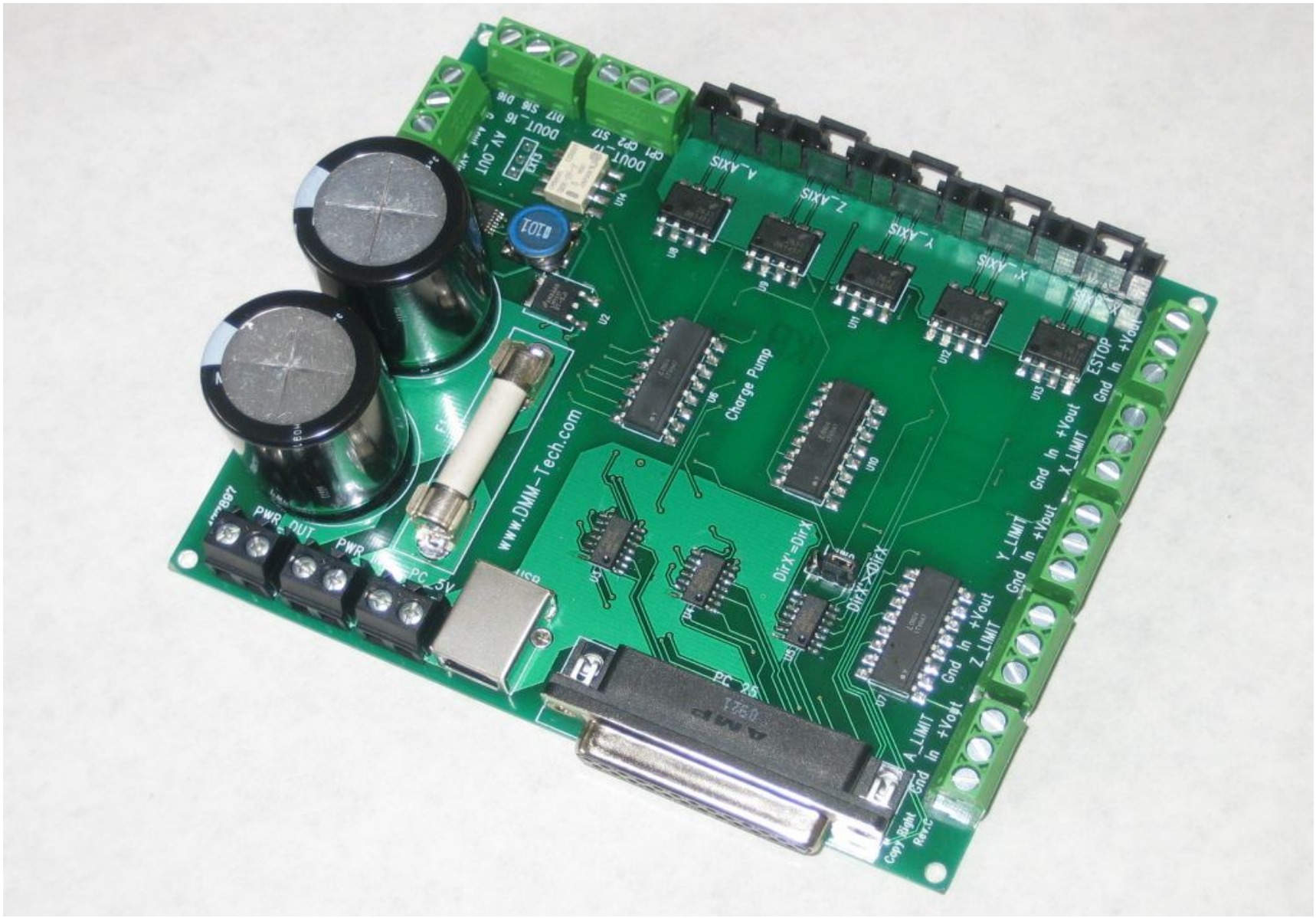
Gear_Num is 500, means 2000steps will turn motor ONE revolution, and **Gear_Num** = 1000, means 4000steps will turn motor one revolution.

In general, 4 * **Gear_Num** steps will turn motor one turn.

For the example in the above picture, the **Main Gain** is 88, and **Speed Gain** is 38, **Integration Gain** is 38, the customer can adjust those values according to their machine inertia situation, normally the higher inertia, the higher the gain.

Finally, click on the **Save All** button to save all the settings to the drive.

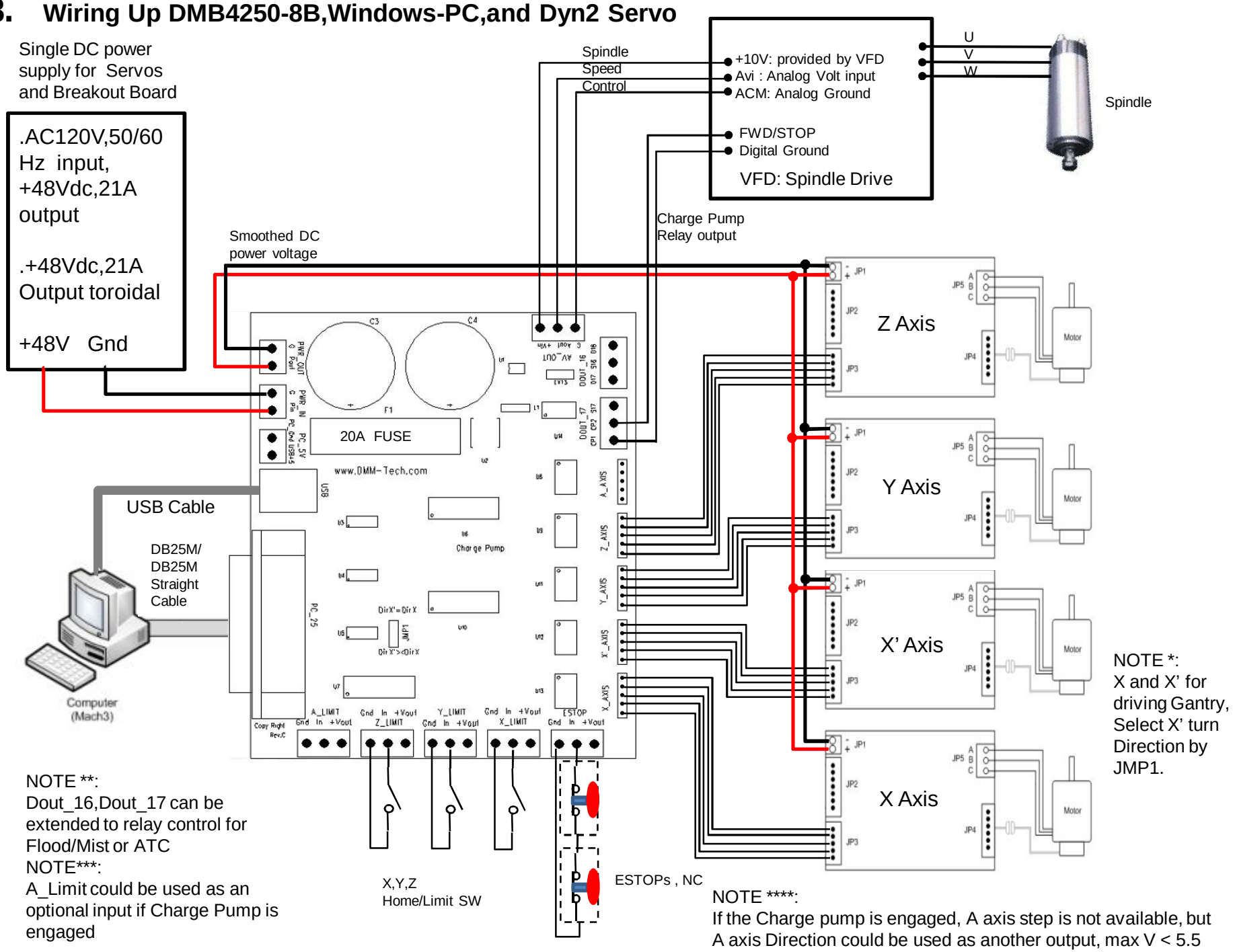
2. DMB4250-8B breakout board picture, functions



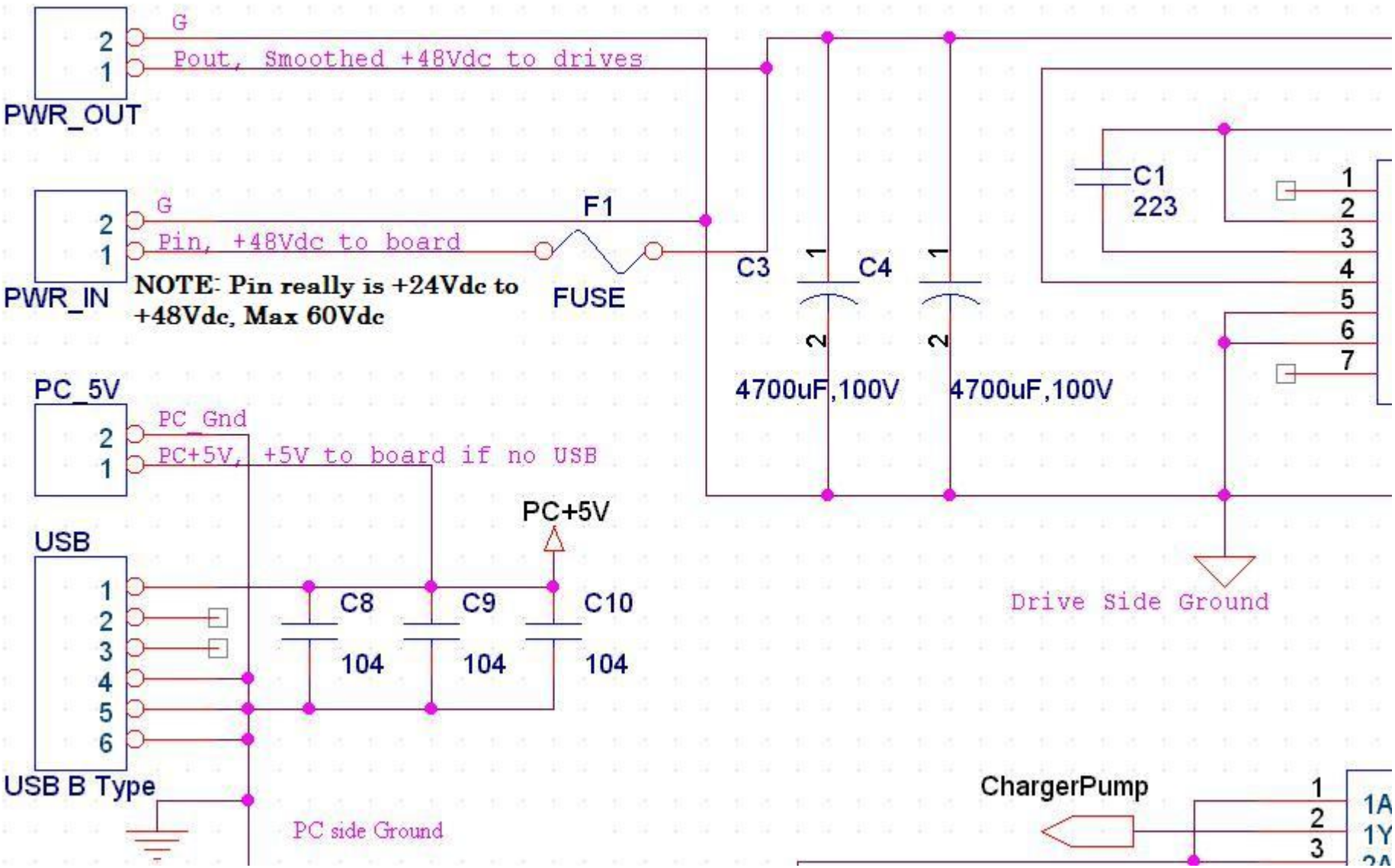
The Features of DMB4250-8B breakout board

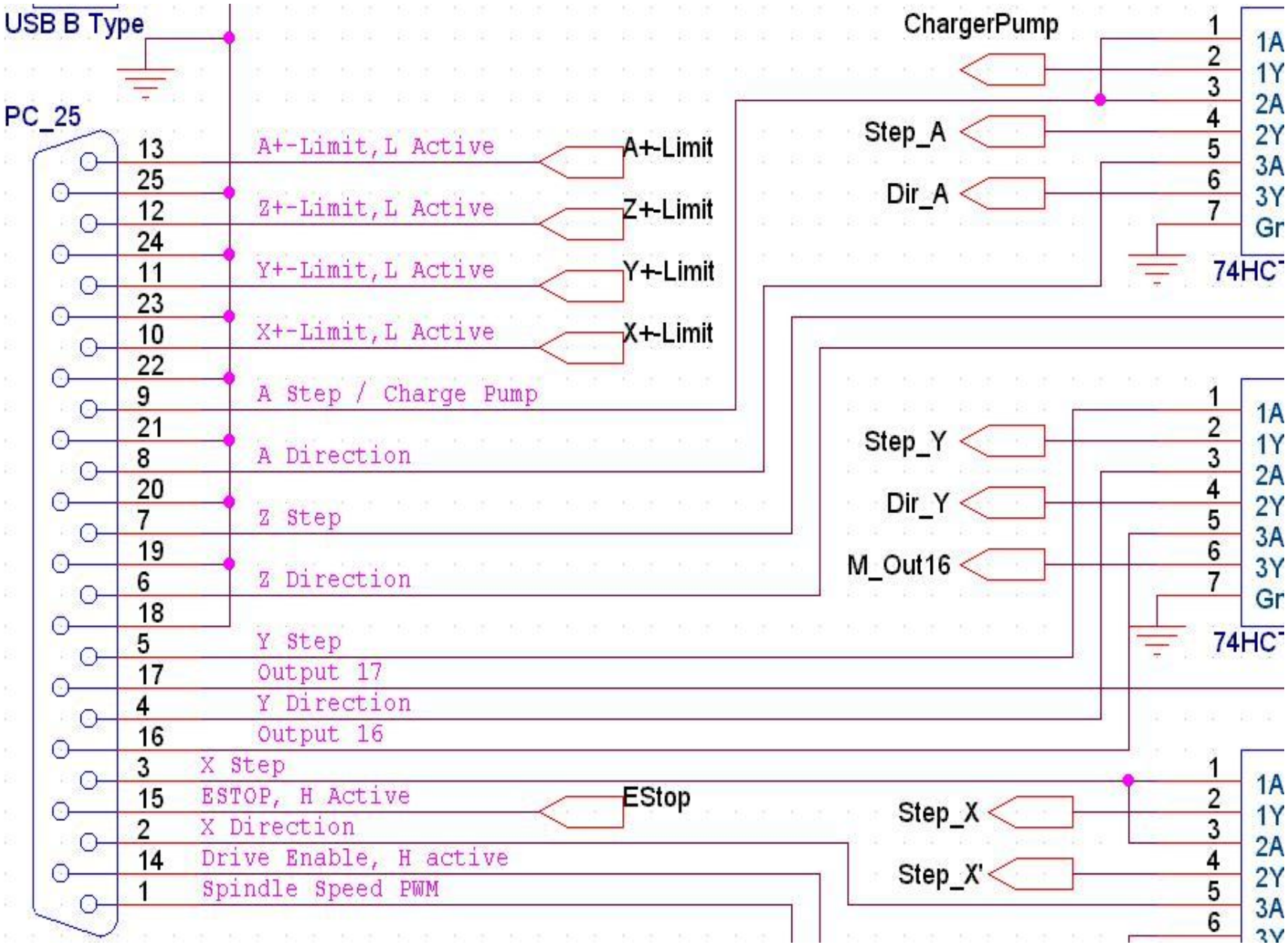
- Fully buffered Opto-isolated I/O
- Isolated PWM analog output signal for spindle speed control
- Charge Pump relay (2 of NO, 1 of NC, 24V, 1A)
- ESTOP hardware logic to disable servo drives and Charge Pump
- All Inputs anti-noise low pass filter
- Hardware generate secondary X' step/direction from X step/direction for driving Gantry, X' direction may different from X direction by JMP1
- Up to 3 more Open-Drain outputs could be extended for Flood/Mist/ATC etc
- On board FUSE and Smooth Capacitors for Drive voltage

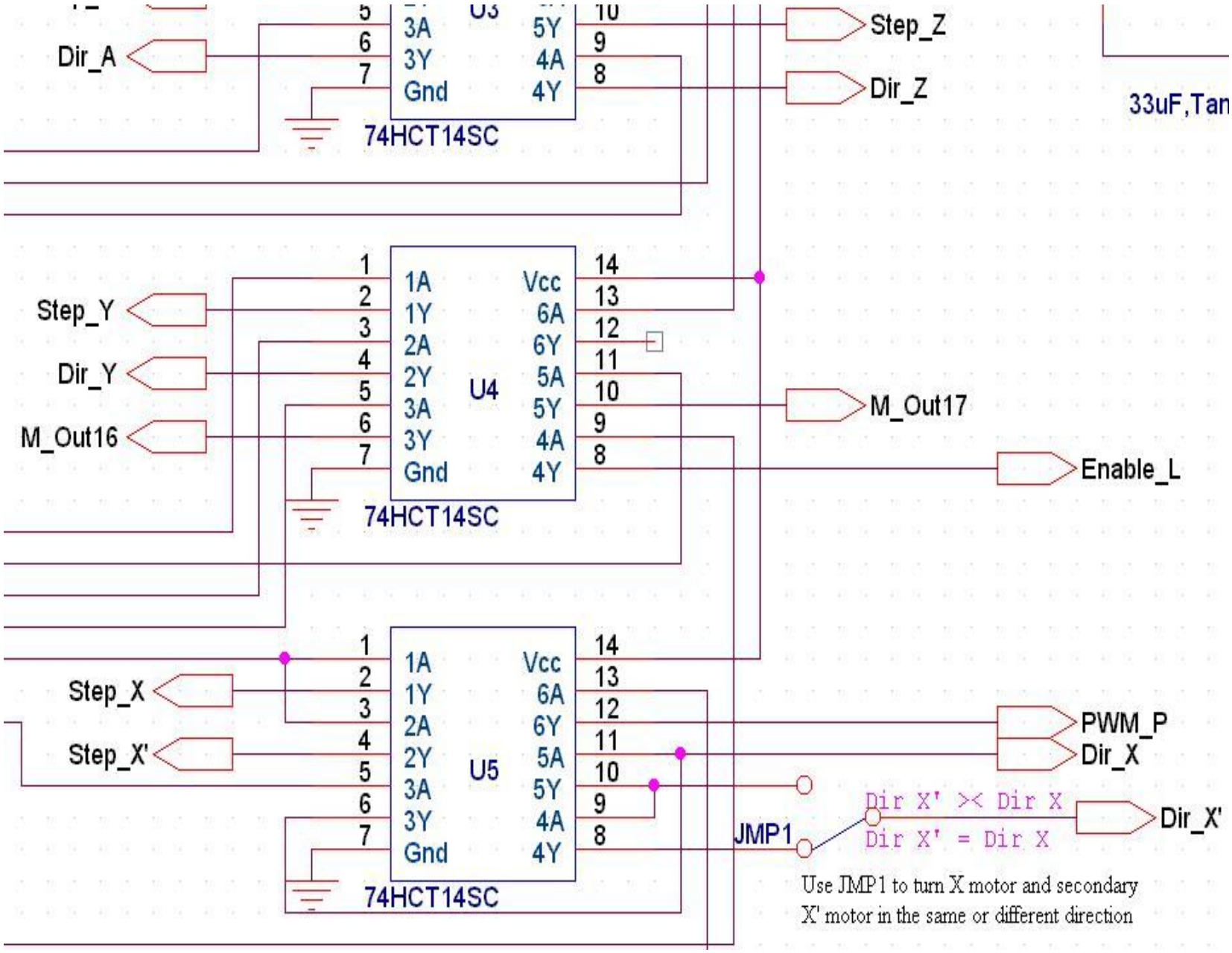
3. Wiring Up DMB4250-8B,Windows-PC,and Dyn2 Servo

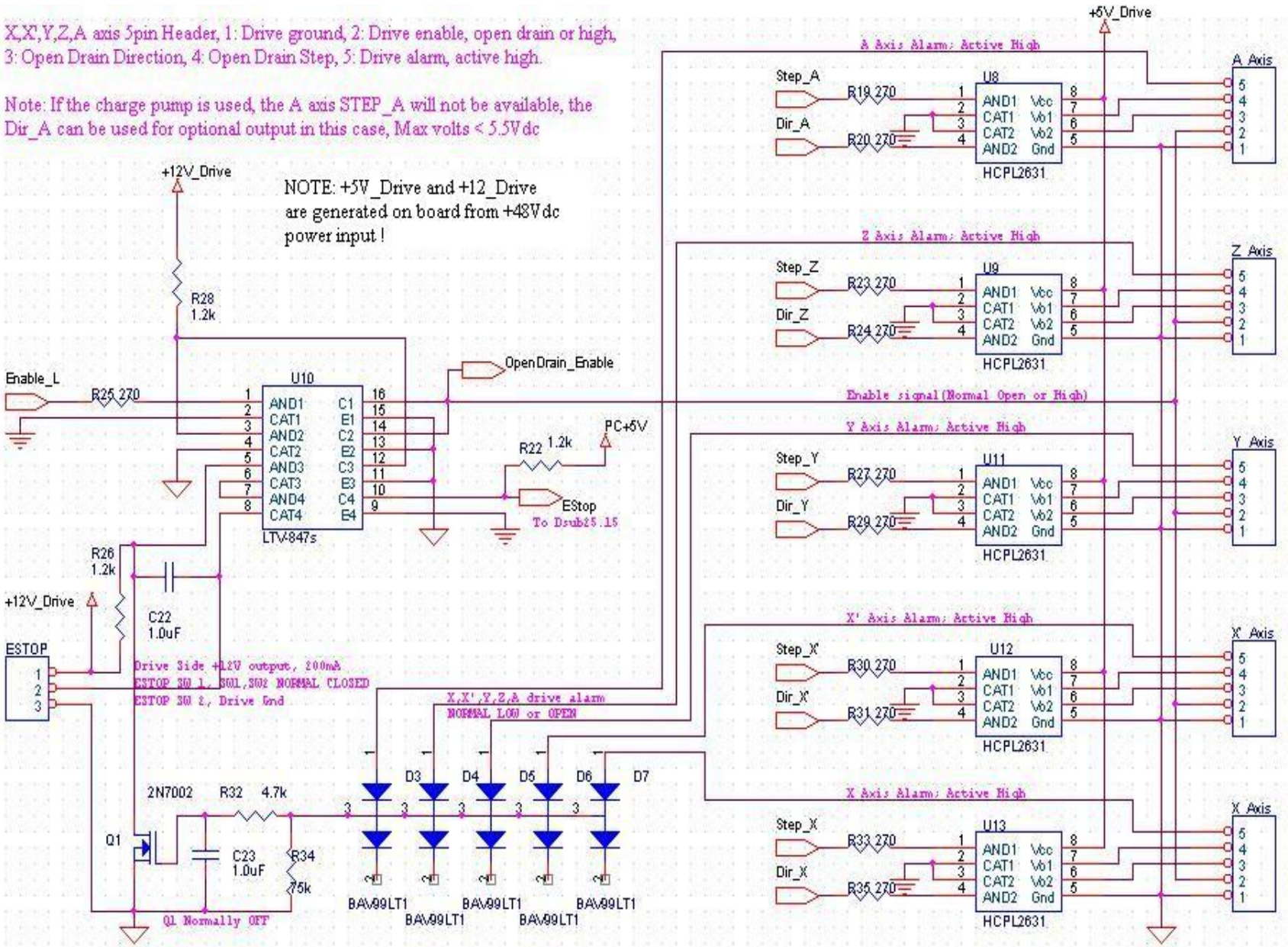


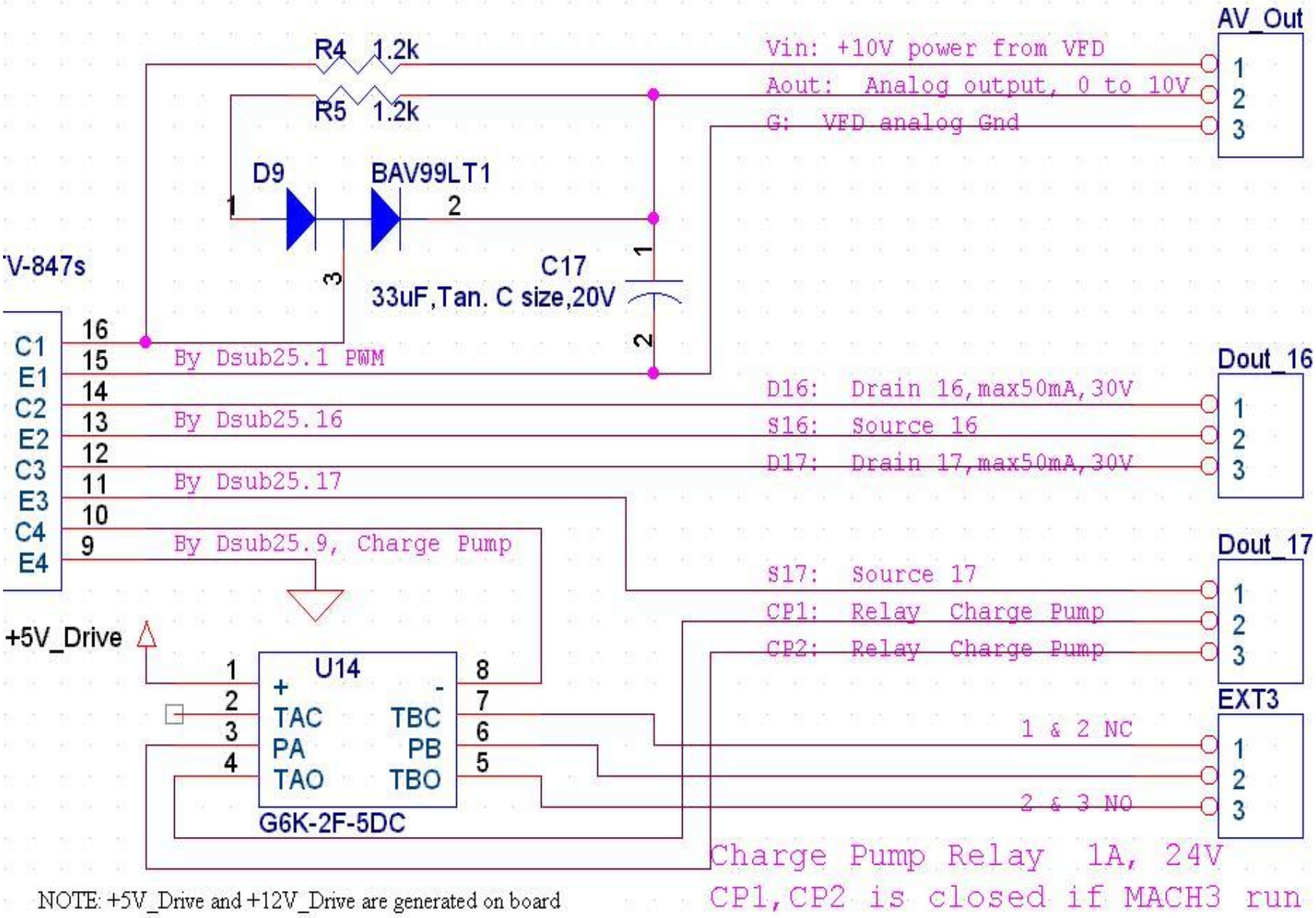
4. I/O definitions for DMB4250-8B

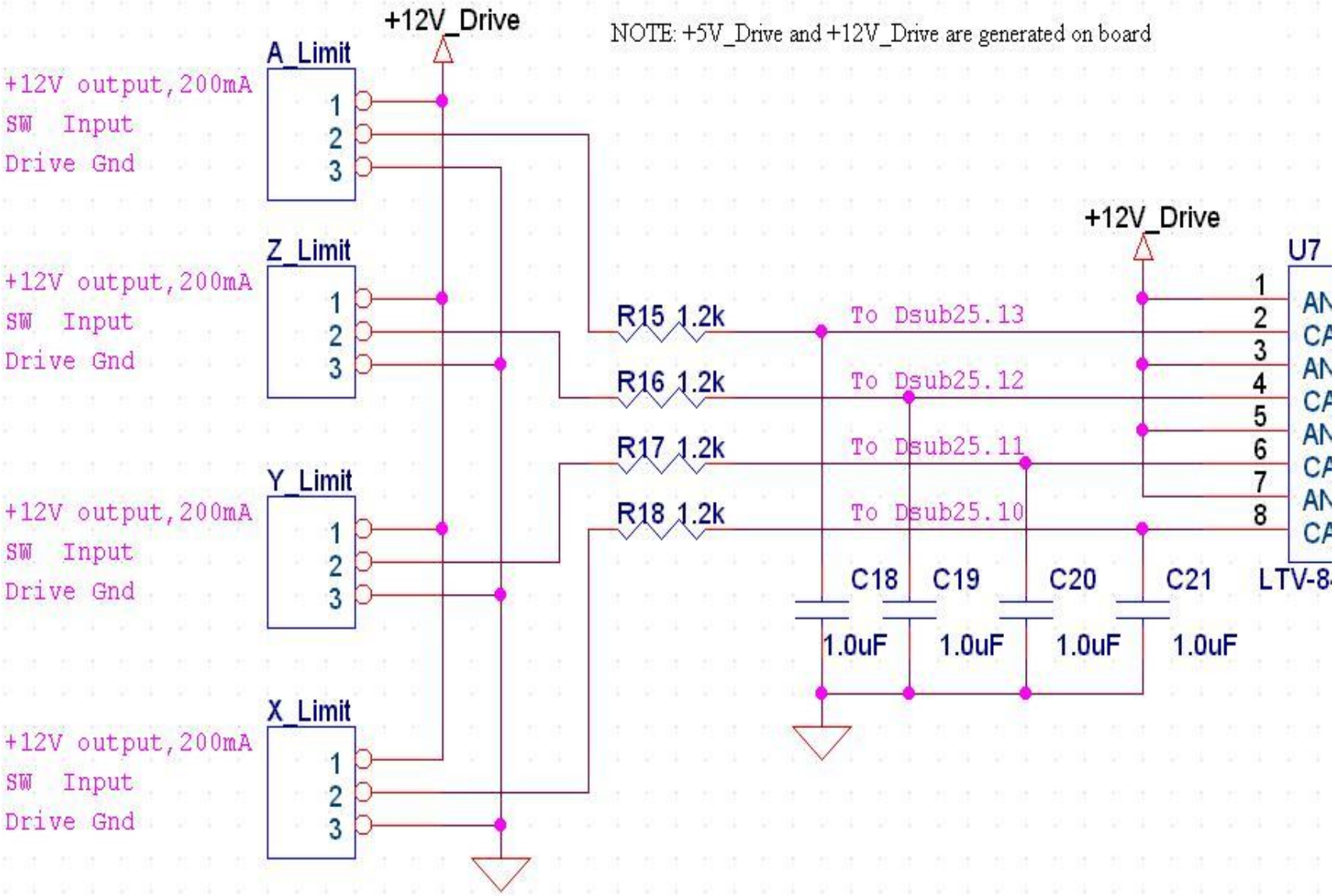



USB B Type
PC_25
13
25
12
24
11
23
10
22
9
21
8
20
7
19
6
18
5
17
4
16
3
15
2
14
1
A+-Limit,L Active
Z+-Limit,L Active
Y+-Limit,L Active
X+-Limit,L Active
A Step / Charge Pump
A Direction
Z Step
Z Direction
Y Step
Output 17
Y Direction
Output 16
X Step
ESTOP, H Active
X Direction
Drive Enable, H active
Spindle Speed PWM
A+-Limit
Z+-Limit
Y+-Limit
X+-Limit
EStop
ChargerPump
Step_A
Dir_A
Step_Y
Dir_Y
M_Out16
Step_X
Step_X'
1A
1Y
2A
2Y
3A
3Y
Gr
74HC

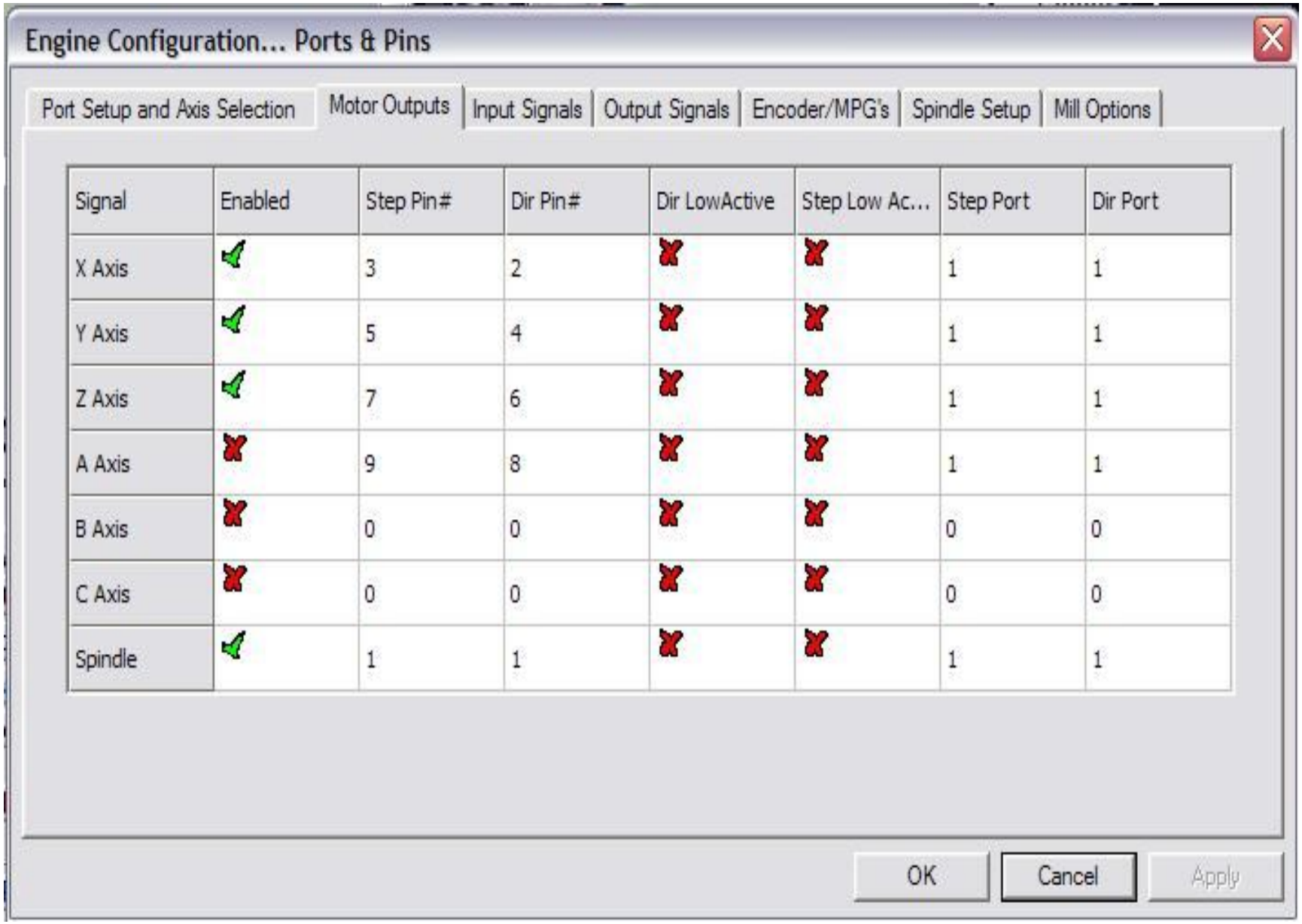

Dir_A
5
6
7
3A
3Y
Gnd
U3
5Y
4A
4Y
10
9
8
74HCT14SC
Step_Z
Dir_Z
33uF,Tan
Step_Y
Dir_Y
M_Out16
1
2
3
4
5
6
7
1A
1Y
2A
2Y
3A
3Y
Gnd
U4
Vcc
6A
6Y
5A
5Y
4A
4Y
14
13
12
11
10
9
8
74HCT14SC
M_Out17
Enable_L
Step_X
Step_X'
1
2
3
4
5
6
7
1A
1Y
2A
2Y
3A
3Y
Gnd
U5
Vcc
6A
6Y
5A
5Y
4A
4Y
14
13
12
11
10
9
8
74HCT14SC
PWM_P
Dir_X
JMP1
Dir X' >< Dir X
Dir X' = Dir X
Dir_X'
Use JMP1 to turn X motor and secondary
X' motor in the same or different direction


X,X',Y,Z,A axis 5pin Header, 1: Drive ground, 2: Drive enable, open drain or high, 3: Open Drain Direction, 4: Open Drain Step, 5: Drive alarm, active high.
Note: If the charge pump is used, the A axis STEP_A will not be available, the Dir_A can be used for optional output in this case, Max volts < 5.5Vdc
NOTE: +5V_Drive and +12_Drive are generated on board from +48Vdc power input !
+12V_Drive
R28 1.2k
Enable_L
R25 270
U10
AND1 CAT1 AND2 CAT2 AND3 CAT3 AND4 CAT4
C1 E1 C2 E2 C3 E3 C4 E4
LTV-847s
OpenDrain_Enable
PC+5V
R22 1.2k
EStop
To Dsub25.15
R26 1.2k
C22 1.0uF
ESTOP
Drive Side +12V output, 200mA
ESTOP 3@ 1, 3@1,3@2 NORMAL CLOSED
ESTOP 3@ 2, Drive Gnd
X,X',Y,Z,A drive alarm
NORMAL LOW or OPEN
D3 D4 D5 D6 D7
BAV99LT1
2N7002 R32 4.7k
Q1
C23 1.0uF
R34 75k
Q1 Normally OFF
+5V_Drive
A Axis Alarm: Active High
Step_A
Dir_A
R19 270
R20 270
U8
HCPL2631
A_Axis
Z Axis Alarm: Active High
Step_Z
Dir_Z
R23 270
R24 270
U9
Z_Axis
Enable signal(Normal Open or High)
Y Axis Alarm: Active High
Step_Y
Dir_Y
R27 270
R29 270
U11
Y_Axis
X' Axis Alarm: Active High
Step_X'
Dir_X'
R30 270
R31 270
U12
X'_Axis
X Axis Alarm: Active High
Step_X
Dir_X
R33 270
R35 270
U13
X_Axis

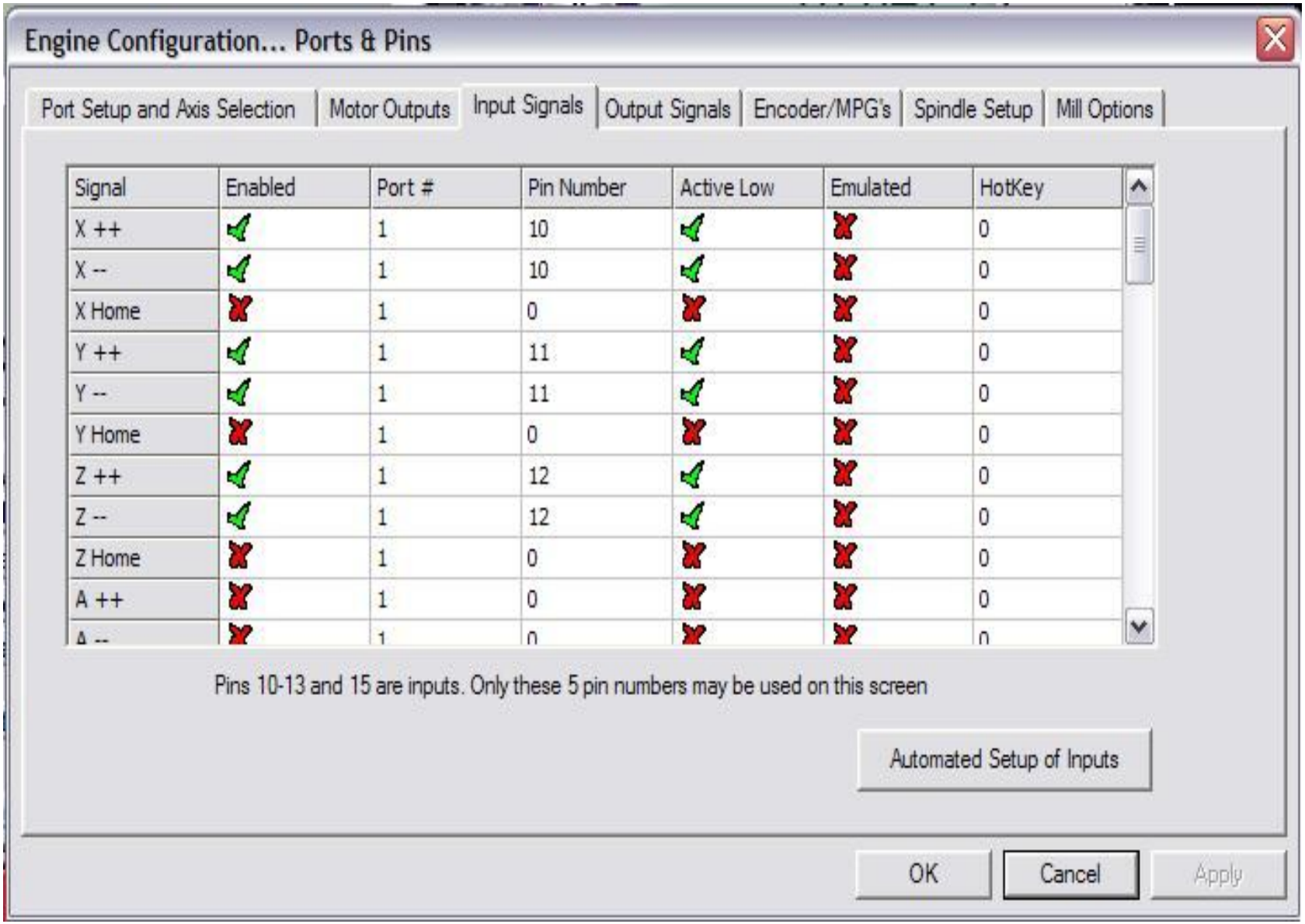

AV_Out
Vin: +10V power from VFD
Aout: Analog output, 0 to 10V
G: VFD analog Gnd
R4 1.2k
R5 1.2k
D9
BAV99LT1
C17
33uF,Tan. C size,20V
V-847s
C1
E1
C2
E2
C3
E3
C4
E4
By Dsub25.1 PWM
By Dsub25.16
By Dsub25.17
By Dsub25.9, Charge Pump
Dout_16
D16: Drain 16,max50mA,30V
S16: Source 16
D17: Drain 17,max50mA,30V
Dout_17
S17: Source 17
CP1: Relay Charge Pump
CP2: Relay Charge Pump
+5V_Drive
U14
TAC
PA
TAO
TBC
PB
TBO
G6K-2F-5DC
EXT3
1 & 2 NC
2 & 3 NO
Charge Pump Relay 1A, 24V
CP1,CP2 is closed if MACH3 run
NOTE: +5V_Drive and +12V_Drive are generated on board

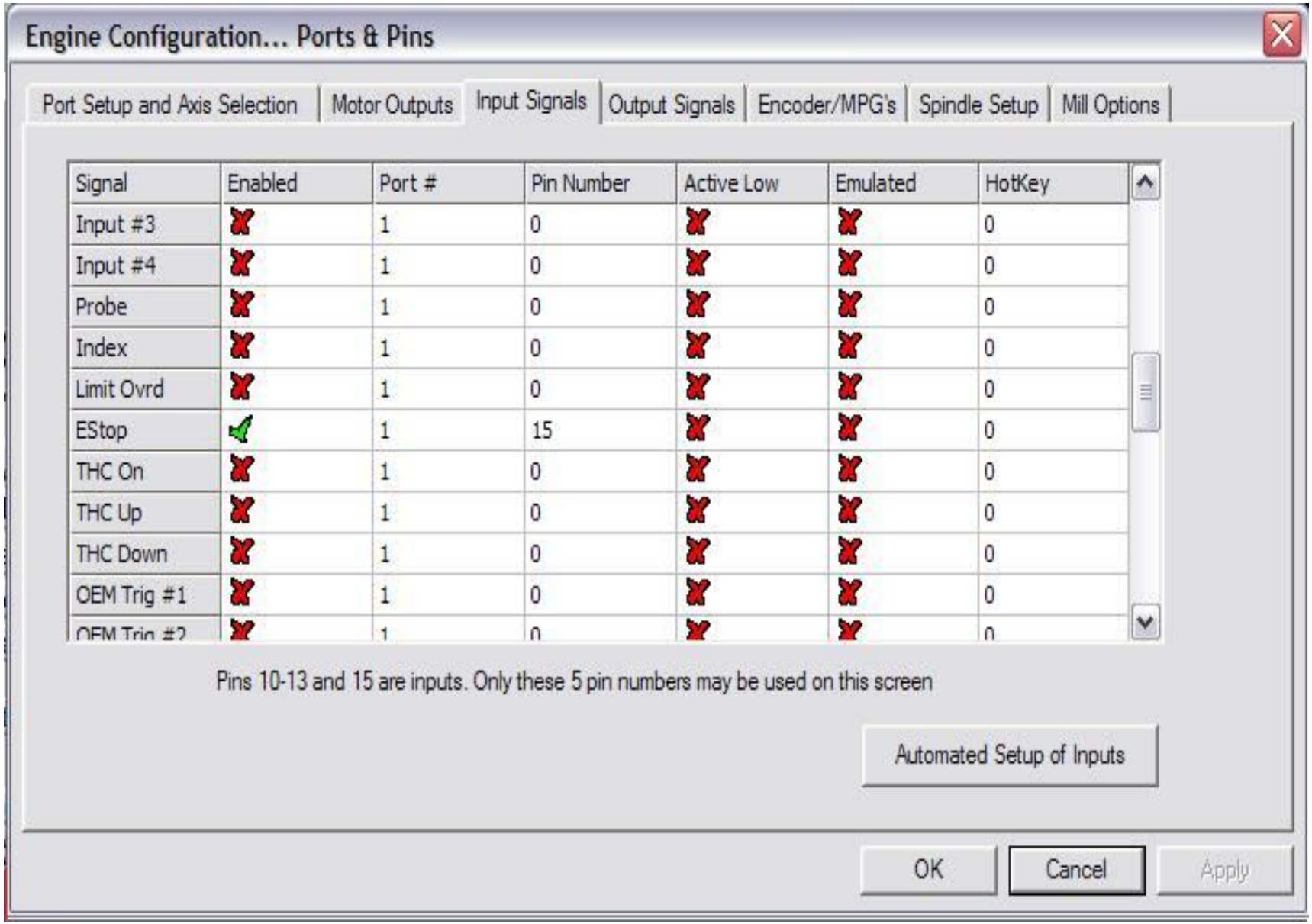

+12V_Drive
NOTE: +5V_Drive and +12V_Drive are generated on board
A_Limit
+12V output,200mA
SW Input
Drive Gnd
Z_Limit
+12V output,200mA
SW Input
Drive Gnd
Y_Limit
+12V output,200mA
SW Input
Drive Gnd
X_Limit
+12V output,200mA
SW Input
Drive Gnd
R15 1.2k
R16 1.2k
R17 1.2k
R18 1.2k
To Dsub25.13
To Dsub25.12
To Dsub25.11
To Dsub25.10
+12V_Drive
U7
C18
C19
C20
C21
1.0uF
1.0uF
1.0uF
1.0uF
LTV-8

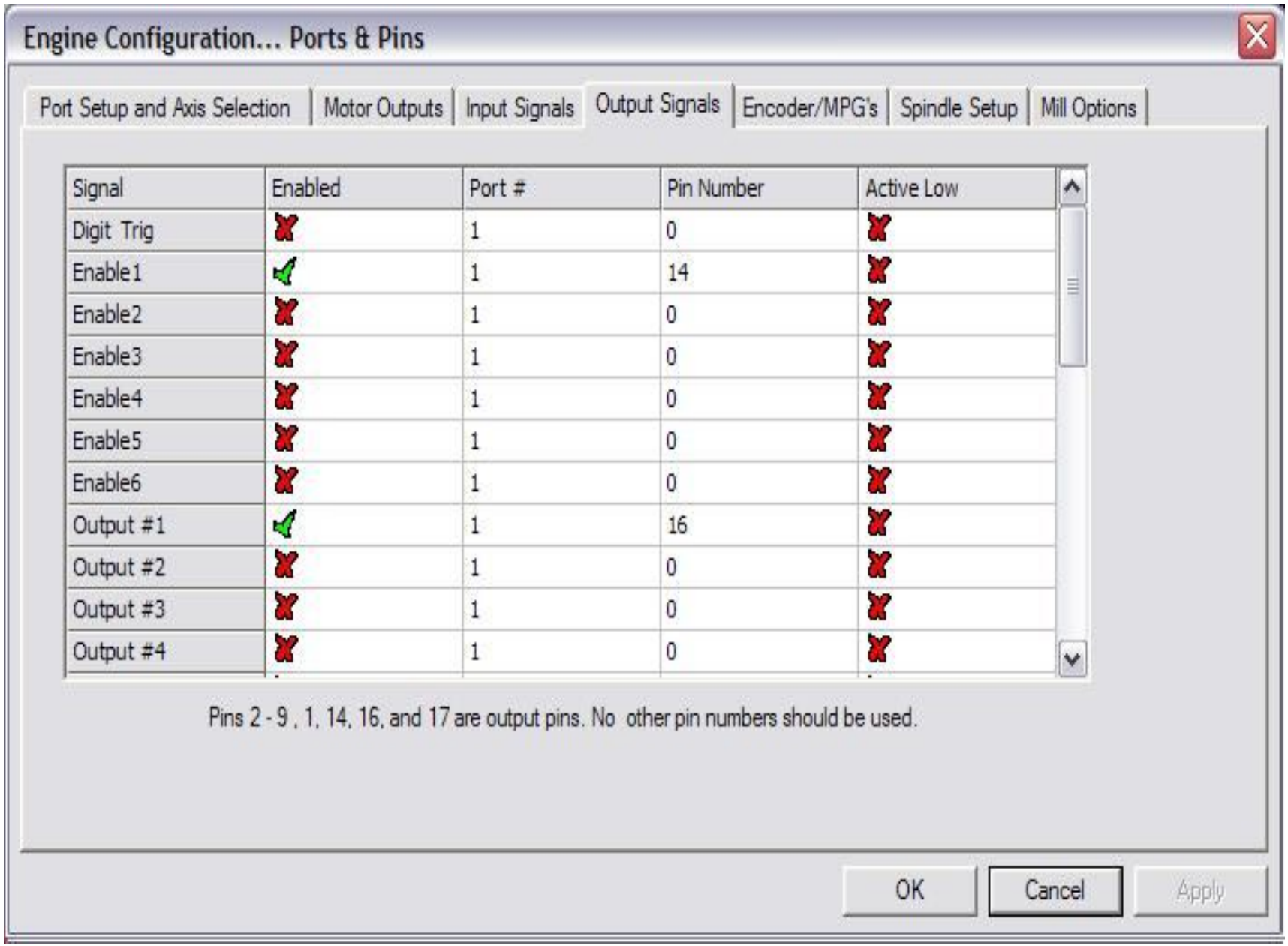
5. Set Up Mach3 for DMB4250-8B

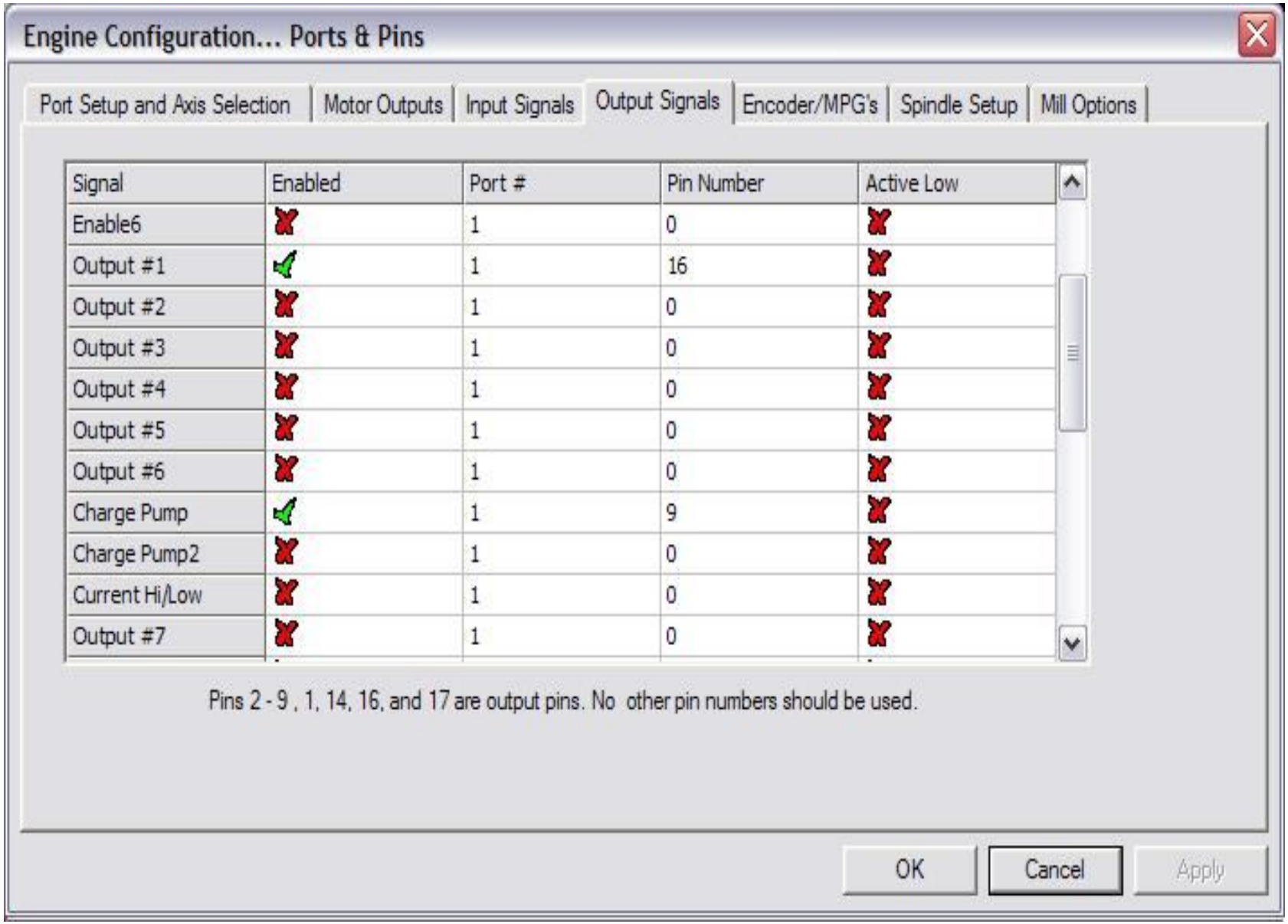


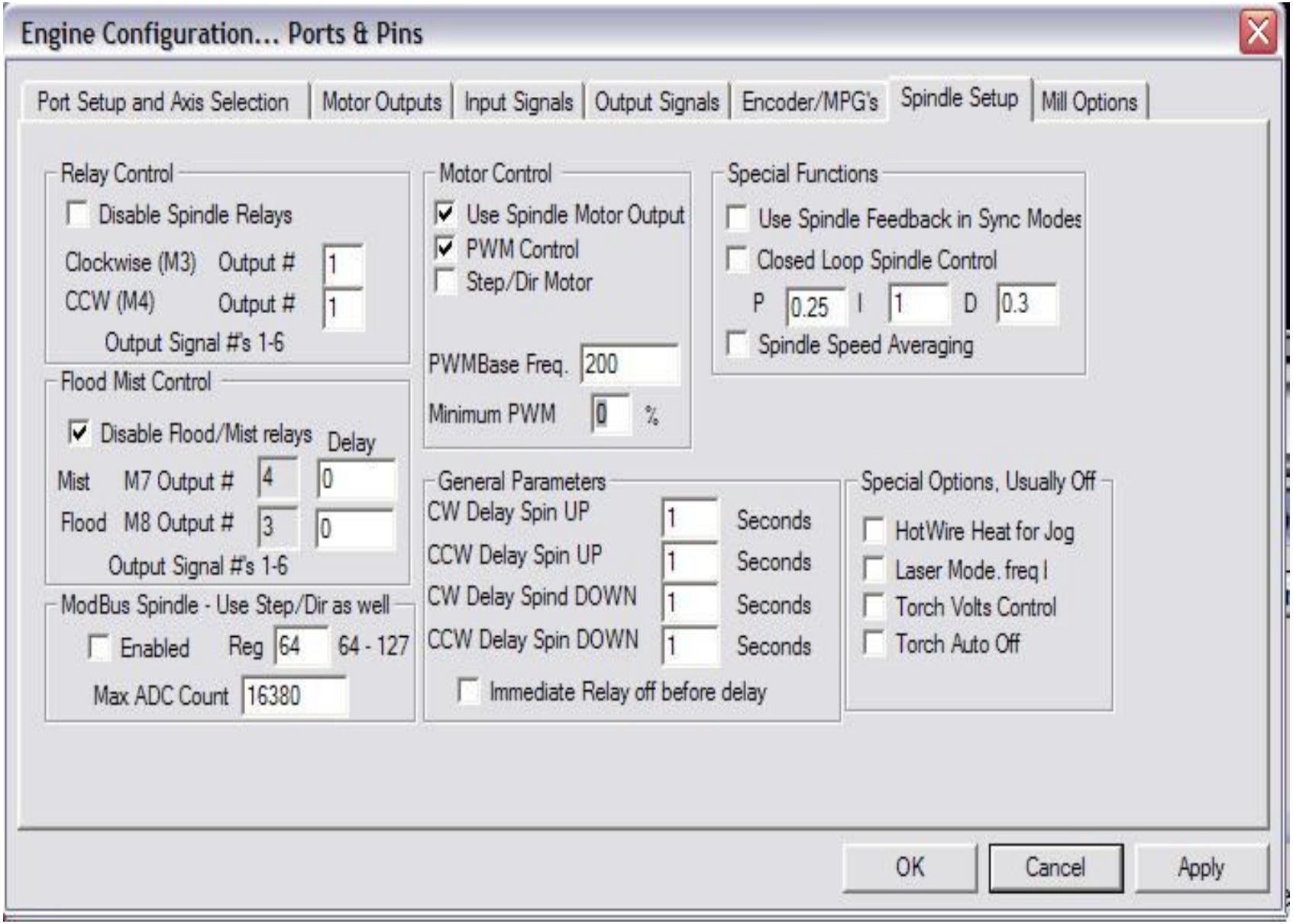
Signal	Enabled	Step Pin#	Dir Pin#	Dir LowActive	Step Low Ac...	Step Port	Dir Port
X Axis	✓	3	2	✗	✗	1	1
Y Axis	✓	5	4	✗	✗	1	1
Z Axis	✓	7	6	✗	✗	1	1
A Axis	✗	9	8	✗	✗	1	1
B Axis	✗	0	0	✗	✗	0	0
C Axis	✗	0	0	✗	✗	0	0
Spindle	✓	1	1	✗	✗	1	1

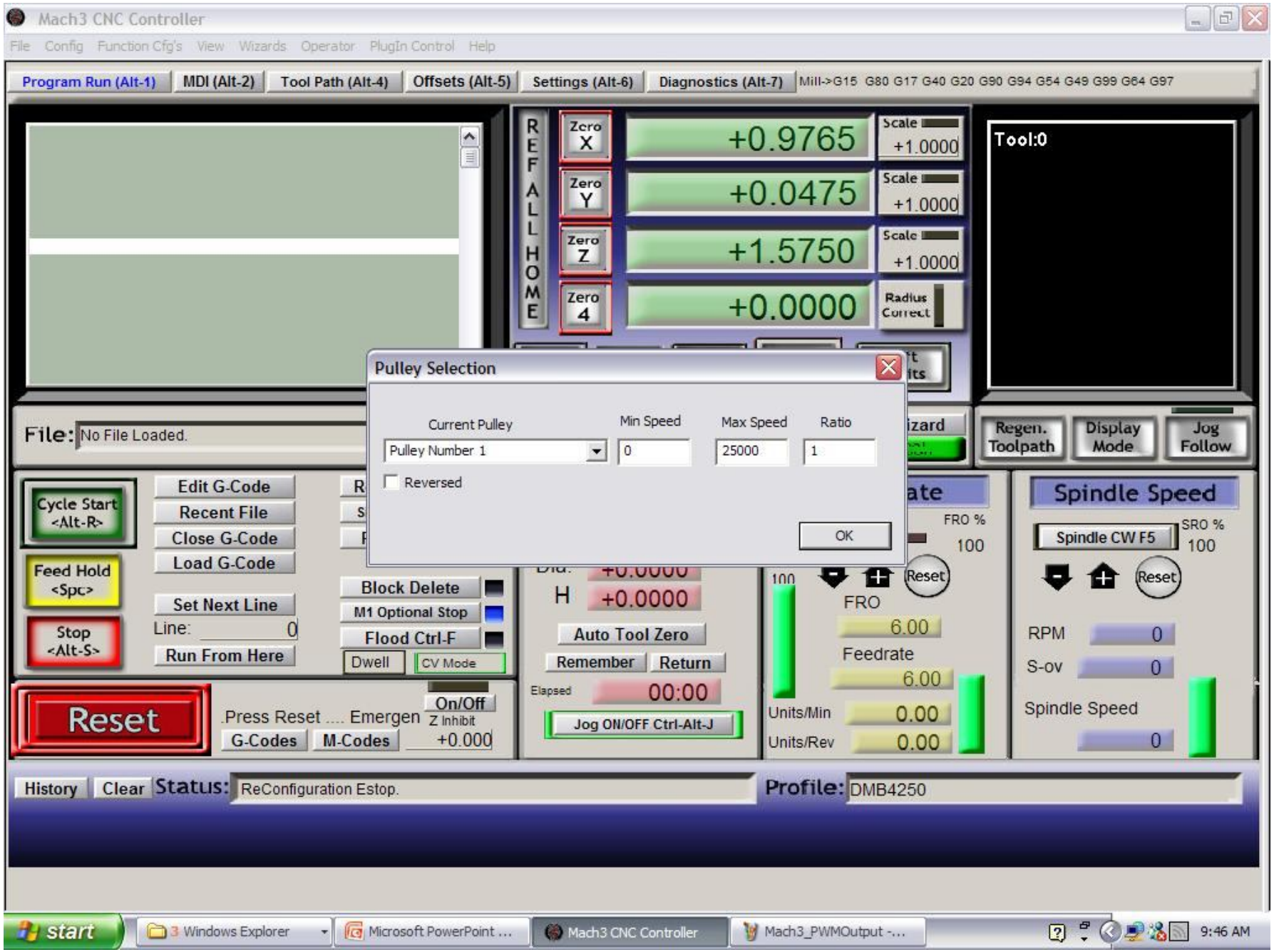

Engine Configuration... Ports & Pins
Port Setup and Axis Selection
Motor Outputs
Input Signals
Output Signals
Encoder/MPG's
Spindle Setup
Mill Options
Signal
Enabled
Port #
Pin Number
Active Low
Emulated
HotKey
X ++ 1 10 0
X -- 1 10 0
X Home 1 0 0
Y ++ 1 11 0
Y -- 1 11 0
Y Home 1 0 0
Z ++ 1 12 0
Z -- 1 12 0
Z Home 1 0 0
A ++ 1 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 #3 1 0 0
Input #4 1 0 0
Probe 1 0 0
Index 1 0 0
Limit Ovrd 1 0 0
EStop 1 15 0
THC On 1 0 0
THC Up 1 0 0
THC Down 1 0 0
OEM Trig #1 1 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
1
0
Enable1
1
14
Enable2
1
0
Enable3
1
0
Enable4
1
0
Enable5
1
0
Enable6
1
0
Output #1
1
16
Output #2
1
0
Output #3
1
0
Output #4
1
0
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
Port #
Pin Number
Active Low
Enable6
1
0
Output #1
1
16
Output #2
1
0
Output #3
1
0
Output #4
1
0
Output #5
1
0
Output #6
1
0
Charge Pump
1
9
Charge Pump2
1
0
Current Hi/Low
1
0
Output #7
1
0
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
Relay Control
Disable Spindle Relays
Clockwise (M3) Output # 1
CCW (M4) Output # 1
Output Signal #'s 1-6
Flood Mist Control
Disable Flood/Mist relays
Delay
Mist M7 Output # 4 0
Flood M8 Output # 3 0
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. 200
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 Modes
Closed Loop Spindle Control
P 0.25 I 1 D 0.3
Spindle Speed Averaging
Special Options, Usually Off
HotWire Heat for Jog
Laser Mode. freq I
Torch Volts Control
Torch Auto Off
OK
Cancel
Apply


Mach3 CNC Controller
File Config Function Cfg's View Wizards Operator PlugIn Control Help
Program Run (Alt-1) MDI (Alt-2) Tool Path (Alt-4) Offsets (Alt-5) Settings (Alt-6) Diagnostics (Alt-7)
Mill->G15 G80 G17 G40 G20 G90 G94 G54 G49 G99 G64 G97
REF ALL HOME
Zero X
Zero Y
Zero Z
Zero 4
+0.9765
+0.0475
+1.5750
+0.0000
Scale +1.0000
Radius Correct
Tool:0
Pulley Selection
Current Pulley
Min Speed
Max Speed
Ratio
Pulley Number 1
0
25000
1
Reversed
OK
File: No File Loaded.
Regen. Toolpath
Display Mode
Jog Follow
Cycle Start <Alt-R>
Feed Hold <Spc>
Stop <Alt-S>
Edit G-Code
Recent File
Close G-Code
Load G-Code
Set Next Line
Line: 0
Run From Here
Block Delete
M1 Optional Stop
Flood Ctrl-F
Dwell
CV Mode
Reset
Press Reset .... Emergen
On/Off
Z Inhibit
+0.000
G-Codes
M-Codes
H +0.0000
Auto Tool Zero
Remember
Return
Elapsed 00:00
Jog ON/OFF Ctrl-Alt-J
FRO %
100
FRO
6.00
Feedrate
6.00
Units/Min 0.00
Units/Rev 0.00
Spindle Speed
Spindle CW F5
SRO %
100
RPM 0
S-ov 0
Spindle Speed
0
History Clear Status: ReConfiguration Estop.
Profile: DMB4250
start
Windows Explorer
Microsoft PowerPoint ...
Mach3 CNC Controller
Mach3_PWMOutput -...
9:46 AM