PISO-PS300

## 3-axis high speed stepping/servo control board

Features

- 32-bit +5V PCI bus, Plug & Play
- 3-axis pulse output stepping/servo control board
- Maximum output pulse rate: 1MHz
- Encoder/pulse read back
- Programmable output mode: CW/CCW, Pulse/Direction
- 3-axis linear interpolation, 2-axis circular interpolation
- Programmable trapezoidal speed profile
- Programmable DDA period
- Programmable direction configuration
- Programmable home return speed, home preset, home direction
- Hardware emergency stop, software emergency stop
- Auto-protection for each limit switch
- 2500Vrms optical isolation
- 8 digital inputs, 7 digital outputs.
  Embedded CPU, totally 45-command set

Functional Description

PISO-PS300 is a 3-axis high speed, pulse-type stepping/ servo motor control board. The embedded CPU of PISO-PS300 performs the motion command transferred from host-PC by way of the 2K bytes FIFOs. It also sends the positions and status back to host-PC via another 2K bytes FIFOs. This buffer provides enough data, and males this card suitable for windows operating system. The motion profile is generated by microprocessor. This microprocessor also handles auto-protection functions. Each digital I/O supports 2500Vrms optical isolation. This board provides DOS, Windows and LabVIEW drivers.

Operating Mode

To developing your system easily, PISO-PS300 provides two operating mode: simulation mode/real mode.
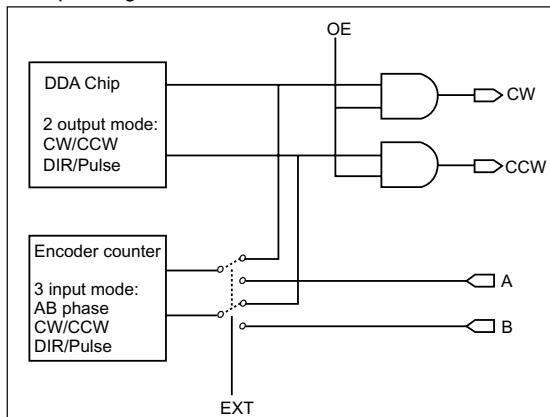
The output pins CW and CCW can be set as output enable or disable by OE signal. The encoder counter source signal can be connected to outside (A/B) or internal DDA chip by EXT signal.

Simulation mode

In simulation mode, the PISO-PS300 will simulate the motion profile according to the motion command that received from host PC, and then the PISO-PS300 will send the 3-axis positions back to host PC. The PISO-PS300 will not output pulse to motor driver by set OE=0. The encoder counter counts the internal DDA output pulse by set EXT=0. Therefore, the positions which read from the encoder counter is really output pulse number. This mode is very useful and efficient in the design phase. The user can debug and develop the motion profile beforehand. And if the user has the daughter board DB-8R, it can also simulate the digital input/output.

Real mode

In real mode, the output mode of DDA chip can be set as CW/CCW or DIR/Pulse mode according to user's motor driver, and set OE=1 for output enable. Setting EXT=1, the source signal of encoder counter come from external input. The input mode of encoder counter could be three kind mode: AB phase, CW/CCW and DIR/Pulse.
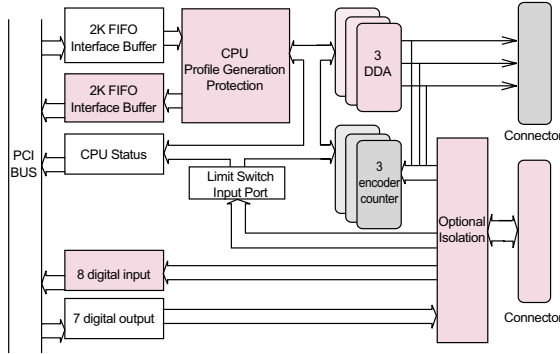
DDA Technology

The DDA chip of PISO-PS300 card will generate equal-space pulse train corresponding to the specific pulse number during a DDA period. This mechanism is very useful to execute pulse generation and interpolation function. The DDA period is determined by DDA cycle. When DDA cycle set to 1, the DDA period is equal to (1+1)x1.024ms=2.048ms. The output pulse number can be set to 0~2047, therefore the maximum output pulse rate will be 1Mpps. The minimum output pulse rate is 3.83pps when set DDA cycle=254 (DDA period=(254+1) x1.024ms =261.12ms) and pulse number=1.

PCI Motion Control

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System Block

System block diagram of PISO-PS300

Specifications

Motion
- Number of axis: 3 axes
- Maximum pulse rate: 1MHz
- Bits up/down ounter for encoder feed-back signals
- Home, forward, backward limit switches per axis
- Programmable limit switch normal state: N.O. or N.C.

General Purpose I/O
- 8-channel isolation digital input
- Input voltage: 0~24V
- 7-channel open collector output
- 2500Vrms optical isolation

I/O connector
- Connector 1: D-sub 25-pin connector for encoder input
- Connector 2: D-sub 9-pin connector for X,Y pulse output and servo-on signal
- Connector 3: D-sub 9-pin connector for Z pulse output, limit switchs and server-on signal
- Connector 4: D-sub 25-pin connector for limit switches, digital input and digital output

General Specifications
- Power requirements: +5V @ 950 mA (typical)
- Operating temperature: 0 ~ 60°C
- Operating humidity: 0 ~ 90% non-condensing
- Storage temperature: -20 ~ 70°C
- Dimensions: 208 mm x 121 mm

Ordering Information
Standard
PISO-PS300: 3-axis high-speed stepping/servo control board
Optional
DB-8R: Motion interface I/O board
DN-25: DIN-rail mounting screw terminal board

Pin Assignment

CN 1

1A+	1	14	2C
1A-	2	15	-2C
1B+	3	16	+GND
1B-	4	17	5V
5V	5	18	2B-
GND	6	19	2B+
1C+	7	20	2A-
1C-	8	21	2A+
5V	9	22	GND
3A+	10	23	3A
3B+	11	24	-3A
3C+	12	25	+3C-
	13		

CN 2

CW_PULSEX	1	6	SONX
CCW_DIRX	2	7	FVCC
CW_PULSEY	3	8	SONY
CCW_DIRY	4	9	
FGND	5		

CN 3

CW_PULSEZ	1	6	/ZI
CCW_DIRZ	2	7	/ZLS+
SON3	3	8	/ZLS-
FVCC	4	9	VEXT
FGND	5		

CN 4

/XLS+	1	14	/IP7
/XLS-	2	15	/IP8
/YLS+	3	16	VEXT
/YLS-	4	17	/OP1
/X1	5	18	/OP2
/YI	6	19	/OP3
/ENG	7	20	/OP4
/IP1	8	21	/OP5
/IP2	9	22	/OP6
/IP3	10	23	/OP7
/IP4	11	24	
/IP5	12	25	/EXT_GND
/IP6	13		