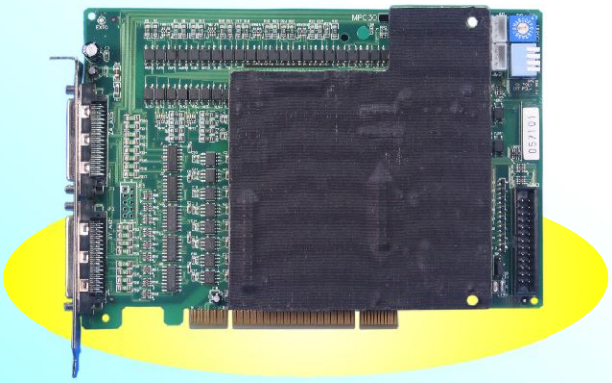
MPC3035A/AL

4-axis Motion Control Card (Servo/Stepping Motor Control)



Features

- 4-axis servo / stepping motor control
- 4 28-bit up/down counters for incremental encoder
- 4 28-bit up/down counters for pulse handler input
- Pulse output rate up to 6.55MHz
- Pulse output options : OUT/DIR, CW/CCW
- 2~4 axes linear interpolation
- Any 2-axes circular interpolation
- S curve or T curve acceleration / deceleration in interpolation and positioning
- Continuous interpolation
- Speed change on the fly
- Synchronized start motion
- Position latch function
- Simultaneously start / stop on multi-axes
- Programmable interrupt conditions
- Backlash compensation
- Pulse handler function
- Software limit switches protection
- Motion parameters change on the fly
- 2 nibble configurable TTL I/O
- Software FIFO for arbitrary curve motion

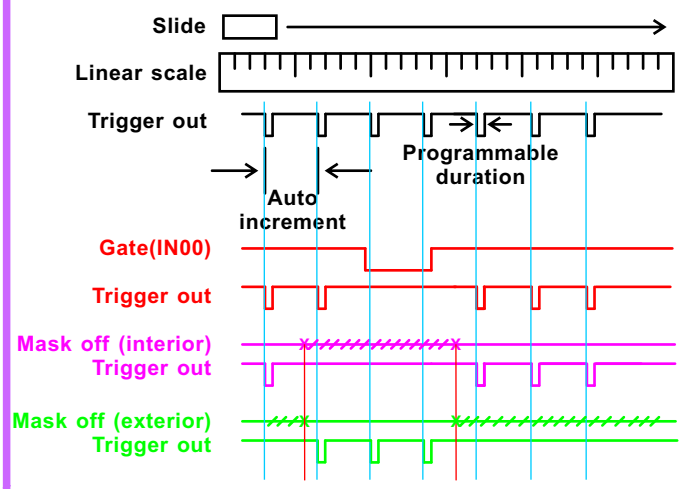
ENCODER counter(daughter board)

- High noise immunity with magnetic / photo-coupler isolation
- 2MHz max. Quadrature input rate
- Two 32-bit counters
- Quadrature, pulse/direcetion and up/down counting
- Programmable multiple rate at x1, x2, x4
- Load preset value to counter by software trigger
- Multiple counter reset (homing) modes
- Differential or single-end input signal
- Auto increment compare mode
- FIFO compare mode (X axis)
- Line driver type compare output
- Programmable duration for compare out
- Interrupt on FIFO alarm (X axis), compare equal, borrow, carry and counter clear
- 2 8-bit 0 ~ 10V PWM DA (MPC3035A only)

Application Tips

Auto increment

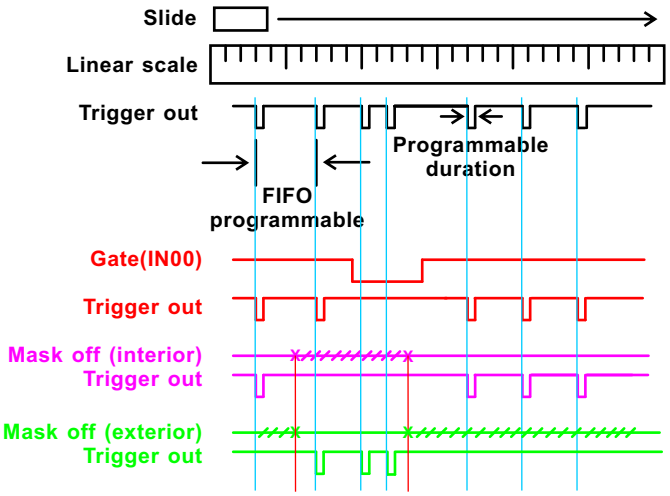
- Using auto increment mode for continuous exposure or image catching



※ Mask off control only available for X-axis
Gate control input : IN0 X-axis, IN1 Y-axis

FIFO programmable

- Using FIFO mode for continuous exposure or image catching



※ Mask off and Gate control only available for X-axis
※ Up to 1023 depth of FIFO (X-axis only)

Introduction

MPC3035A/AL is a MPC3034A 4-axis motion control card with daughter board MPC3035S high performance encoder counter functions card for complex application in precision motion requirements.

Motion

It involved point to point, linear and circular interpolation control function. Up to 16 identical cards can be hooked on same IPC provision for multiple-axes control.

Dll and Driver are provided for WinXP, WIN7 and later or LINUX platform and its sample programs come with VB source code.

Various Homing Modes

Total of 14 homing modes are available to meet various mechanism requirements. Additional zero phase inputs from encoder for accurate positioning and absolute homing reference.

Motion Control

Linear interpolation from 1 axis to 8 axes is programmable, circular interpolation from any two of X, Y, Z, A axes or any two of B, C, D, Z axes.
Backlash compensation for accurate position. Speed change on the fly, 8 28-bit counter for feedback and 4 28-bit counter for pulse handler input give the maximum extend of motion control.

Digital I/O

Motion related I/O's such as LS+, LS-, Home and general I/O are all isolated by photo couplers. I/O signals polarity can be changed by DIP switch or software, nibble configurable TTL I/O for general purpose application, 8 isolated digital I/P and 8 isolated digital O/P for external device control.

Segment Mask Off and External Gate

The compare output can be gated by IN0 (for X out) or IN1 (for Y out).

Except for external gate, the segment mask off function provides more flexible control. There are 3 programmable coordinate segments, any or all of the 3 segments can be configured exterior or interior to mask off the compare out signal without effecting the compare function of auto increment or FIFO.

Encoder Counter

Load preset position value to counter form software / external trigger and latch current position from counter to buffer are the highlight of this card.

The compare output function (designed for X, Y respectively) is very useful for encoder or linear scale measurement integrated with CCD/LASER sub-system, or in a complex and multi-tasks equipments. Additional FIFO for compare function (X-axis only) provides more flexibility than just compare or auto-increment.

Encoder Interface

Each input includes a decoding circuit for incremental quadrature encoding and accepts either single-ended or differential signals. Quadrature input works with or without an index, allowing linear or rotary encoder feedback.

Counters

The MPC3035A has two independent 32-bit counters. The maximum quadrature input rate is 2.0 MHz, and the maximum input rate under (counter mode) is 4.0 MHz. You can individually configure each counter for quadrature, pulse/direction or up/down counting.

Note

Specifications
(With Matched Wiring Board)

Motion

- Max Pulse Rate : 6,553,500 pps
- Pulse Output Mode : Single phase : CLOCK, DIR
  Dual phase : CW, CCW
- Acceleration / Deceleration Mode : linear, S-curve mode
- Homing Mode : 14 types
- Encoder Up/Down Counter : 4 28-bit counter
- Pulse Handle Up/Down Counter : 4 28-bit counter
- Linear Interpolation : any 2 up to 4-axes
- Circular Interpolation : any 2-axes

Counter(daughter board)

- Number Of Axes : 2, independent
- Maximum Quadrature Input Frequency : 2MHz
- Maximum Input Pulse Frequency : 4MHz
- Encoder Type : Single-end or differential
- Input Pulse Multiple Rate : x1, x2, x4 programmable
  (quadrature signal only)
- Counter Length : 32-bit
- Counter Mode : (QUADRATURE), (CLOCK /DIRECTION),
  (UP CLOCK / DOWN CLOCK)
- Sample Clock Frequency : 8MHz
- Software Homing (reset) Counter Method :
  one software trigger mode
- Hardware Homing (reset) Counter Method :
  five H/W trigger mode
- Compare Mode : one-time, auto increment, FIFO
- Compare Method : equal, equal or less then, equal or greater than.
- External Gate : IN0, IN1
- External Gate Polarity : programmable
- Mask Off Segment : 3
- Mask Off Region : exterior or interior
- FIFO Depth : 1023 (X, Z axis)
- Compare Out One Shot Duration : 1~16777215 us

Digital I/O

- Motion Specific Input : SRDY, ALM, LS+(EL+), LS-(EL-), SD, HOME(ORG), PCS, LTC per axis, EMG per card
- Motion Specific Output : CMP, SVON, ERC, FIN per axis
- General Input : INP per axis
- General Output : FIN per axis
- TTL I/O : 2 nibble configurable TTL I/O
- General purpose differential input : 1-bit per axis (MPC3035D)

Analog Output

- PWM DA : 8-bit, unipolar 0Vdc ~ 10Vdc (MPC3035A only)

Main Card General

- Card ID : 16 locations set by rotary switch
- Insulation Resistance : 100M Ohm (min) at 1000Vdc
- Isolation Voltage : 2500Vac 1Min
- I/O Connector : 2 68-pin female mini SCSI connector for motion control function (JF1/JF2)
  1 25P D type for MPC3035D counter function (JM1)
  1 25P D type for pulse handler related function (JM3)
- External Supply : 24Vdc ± 4Vdc
- Operation Temperature : 0 °C ~ +70 °CS
- Storage Temperature : -20 °C ~ +80 °C
- Operation Humidity : 5~95% RH, non-condensing
- Dimensions : 175(W)*122(H)mm, 6.9(W)*4.8(H)in

Applications

- Precision positioning control
- X-Y table control
- Rotary machine control
- Robotics control
- Biotech sampling and handling
- Any combined control servo and stepping Motor
- Contouring control
- Precision speed control
- NC pipe bender
- NC spring forming machine
- Event counting
- Frequency counter
- Pulse signal receiver / display
- Touch probe / non-touch probe trigger to latch position
- Linear Scale F/B
- Servo encoder F/B

Pin Assignments

JF2 / JF1

+24Vin	68	34	+24Vin		
+5Vin	67	33	+5Vin		
EXTG	66	32	EXTG		
NC	65	31	NC		
EXTG	64	30	EMG		
NC	63	29	NC		
NC	62	28	NC		
NC	61	27	NC		
NC	60	26	NC		
NC	59	25	NC		
NC	58	24	NC		
(Y/A) ERC	57	23	SVON	(Y/A)	
(Y/A) ALM	56	22	SRDY	(Y/A)	
(Y/A) INP	55	21	CCW-	(Y/A)	
(Y/A) CCW+	54	20	CW-	(Y/A)	
(Y/A) CW+	53	19	EZ-	(Y/A)	
(Y/A) EZ+	52	18	EB-	(Y/A)	
(Y/A) EB+	51	17	EA-	(Y/A)	
(Y/A) EA+	50	16	CMP	(Y/A)	
(Y/A) FIN	49	15	LTC	(Y/A)	
(Y/A) PCS	48	14	HOME	(Y/A)	
(Y/A) SD	47	13	LS-	(Y/A)	
(Y/A) LS+	46	12	ERC	(X/Z)	
(X/Z) SVON	45	11	ALM	(X/Z)	
(X/Z) SRDY	44	10	INP	(X/Z)	
(X/Z) CCW-	43	9	CCW+	(X/Z)	
(X/Z) CW-	42	8	CW+	(X/Z)	
(X/Z) EZ-	41	7	EZ+	(X/Z)	
(X/Z) EB-	40	6	EB+	(X/Z)	
(X/Z) EA-	39	5	EA+	(X/Z)	
(X/Z) CMP	38	4	FIN	(X/Z)	
(X/Z) LTC	37	3	PCS	(X/Z)	
(X/Z) HOME	36	2	SD	(X/Z)	
(X/Z) LS-	35	1	LS+	(X/Z)	

JM3

+5Vout_PC	1	14	+5Vout_PC
PA1	2	15	PB1
PA2	3	16	PB2
GND	4	17	GND
PA3	5	18	PB3
PA4	6	19	PB4
GND	7	20	GND
+5Vout_PC	8	21	+5Vout_PC
IO0	9	22	IO1
IO2	10	23	IO3
IO4	11	24	IO5
IO6	12	25	IO7
GND	13		

DB25PF

JM1

YA+	14	1	XA+
YA-	15	2	XA -
YB+	16	3	XB +
YB -	17	4	XB -
YZ+	18	5	XZ+
YZ -	19	6	XZ -
IN1	20	7	IN0
+5Vout_PC	21	8	+5Vout_PC
YOUT+	22	9	XOUT+
YOUT-	23	10	XOUT-
GND	24	11	GND
DA2	25	12	DA1
		13	GND

DB25PM

Software Support

➤PC OS Support

WinXP, Win7 and later or Linux O.S.
Embedded XP, Win CE (at request)

➤Library

DLLs, VI library

➤Develop Software

Visual C++, Visual Basic,
Borland C/C++ Builder, LabVIEW etc

➤Example Source Code

Visual Basic

Ordering Information

➤**MPC3035A :** 4-axis motion control card with advanced encoder counter function for servo / step motor control with 2 8-bit DA's (include SM23404, SM23405)

➤**MPC3035AL :** 4-axis Motion Control Card for Servo / Stepping Motor Control (include SM23404, SM23405)

➤**ADP3024DIN(N) :** DIN rail mounted wiring board matched MPC3024A/3028A/3034A/3035A/AL, General output : 8 NMOS P.19

➤**ADP3024DIN(P) :** DIN rail mounted wiring board matched MPC3024A/3028A/3034A/3035A/AL, General output : 8 PMOS P.19

➤**ADP3024DIN(R) :** DIN rail mounted wiring board matched MPC3024A/3028A/3034A/3035A/AL, General output : 8 Relays P.19

➤**M266868151 :** 68-pin mini-SCSI cable 1.5 M for JF1/JF2 I.18

➤**M2668683011 :** 68-pin mini-SCSI cable 3.0 M for JF1/JF2 I.18

Note : Two axes control signals granted in one cable.

➤**JS51050 :** DIN rail mounted dummy wiring board (D type 25P male to terminals) for JM3 I.12

➤**JS510501 :** DIN rail mounted dummy wiring board (D type 25P female to terminals) for JM1 I.12

➤**M270325X0 :** D type 25P male-female cable 3.0M for JM1、JM3 I.17

➤**M270325X0S :** D type 25P male-female cable 3.0M, shielding for JM1、JM3 I. 17

➤**M270325X4 :** D type 25P male-female cable 1.5M for JM1、JM3 I.17

➤**M270325X4S :** D type 25P male-female cable 1.5M, shielding for JM1、JM3 I.17

➤**FVC01 :** Frequency to voltage module P.23

➤**SM23404 :** Extension kit for JM3 (bracket and flat cable for 25P female D type connector)

➤**SM23405 :** Extension kit for JM1 (bracket and flat cable for 25P male D type connector)