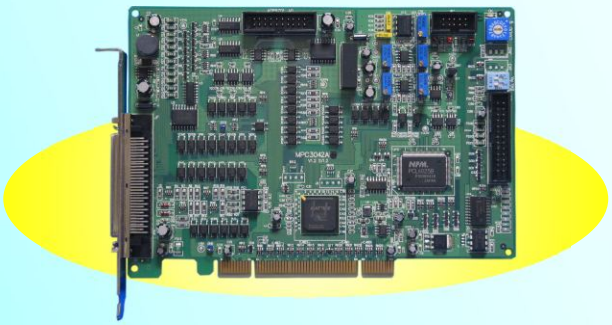
# MPC3042A/AL

## 2-axis Motion Control Card (Servo/Stepping Motor Control)



**Pulse Referenced PI Closed Loop Control (MPC3042A only)**

- 17-bit DA with digital PI motion control
- Feedback encoder failure detection
- Tracking control

## Features

- 2-axis servo / stepping motor control
- 2 28-bit up / down counters for incremental encoder
- 2 28-bit up / down counters for pulse handler input
- Pulse output rate up to 6.55MHz
- Pulse output options : OUT/DIR, CW/CCW
- linear interpolation
- 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
- Software limit switches protection
- Motion parameters change on the fly
- 8-bit PWM DA
- 32-bit timer

## Introduction

MPC3042A is a 2-axis pulse referenced closed loop motion control card for economical and high precision motion requirements. MPC3024AL is a full function replacement for old MPC3042 card. They 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 and circular interpolations are standard functions. Backlash compensation for accurate position. Speed change on the fly, 2 28-bit counters for feedback and 2 28-bit counters for pulse handler input give the maximum extend of motion control.

### Closed loop PI motion control *(MPC3042A only)*

The control loop command comes from the motion pulses and compare the feedback to compute the PI compensation. The PI loop can also program as master-slave tracking control. If you do not use closed loop control the pusle conmand is also available for pusle type driver and you get extra general purpose D/A.

### Digital I/O

Motion related I/O's such as LS+, LS-, Home and general I/O are all isolated by photo-coupler. I/O signals polarity can be changed by DIP switch or software, 2 extra nibble configurable TTL IO for general purpose application.

### PWM DA

8-bit PWM DA provide control for the application needs extra speed control.

## Pin Assignments

**JF1**

| | | | |
|---|---|---|---|
| EXTG | 68 | 34 | EXTG |
| YEZ- | 67 | 33 | XEZ- |
| YEZ+ | 66 | 32 | XEZ+ |
| YEB- | 65 | 31 | XEB- |
| YEB+ | 64 | 30 | XEB+ |
| YEA- | 63 | 29 | XEA- |
| YEA+ | 62 | 28 | XEA+ |
| EXTG | 61 | 27 | EXTG |
| YCCW - | 60 | 26 | XCCW - |
| YCCW+ | 59 | 25 | XCCW+ |
| YCW- | 58 | 24 | XCW - |
| YCW+ | 57 | 23 | XCW+ |
| EXTG | 56 | 22 | EXTG |
| YERC | 55 | 21 | XERC |
| YSVON | 54 | 20 | XSVON |
| YSRDY | 53 | 19 | XSRDY |
| YALM | 52 | 18 | XALM |
| YINP | 51 | 17 | XINP |
| EXTG | 50 | 16 | EXTG |
| YSTA | 49 | 15 | XSTA |
| YCMP | 48 | 14 | XCMP |
| YFIN | 47 | 13 | XFIN |
| EMG | 46 | 12 | EMG |
| YPCS | 45 | 11 | XPCS |
| YSD | 44 | 10 | XSD |
| YLTC | 43 | 9 | XLTC |
| YORG | 42 | 8 | XORG |
| YLS- | 41 | 7 | XLS - |
| YLS+ | 40 | 6 | XLS+ |
| EXTG | 39 | 5 | EXTG |
| +5Vout | 38 | 4 | EXTG |
| +5Vout | 37 | 3 | EXTG |
| EXTG | 36 | 2 | +24Vin |
| EXTG | 35 | 1 | +24Vin |

**JM4**

| | | | |
|---|---|---|---|
| +5Vout_PC | 1 | 14 | +5Vout_PC |
| PA1 | 2 | 15 | PB1 |
| PA2 | 3 | 16 | PB2 |
| GND | 4 | 17 | GND |
| NC | 5 | 18 | NC |
| NC | 6 | 19 | NC |
| GND | 7 | 20 | GND |
| +5Vout_PC | 8 | 21 | +5Vout_PC |
| IO10 | 9 | 22 | IO11 |
| IO12 | 10 | 23 | IO13 |
| IO14 | 11 | 24 | IO15 |
| O1I6 | 12 | 25 | IO17 |
| GND | 13 | | |

**ADP9201_JM1**

| | | | |
|---|---|---|---|
| IN0 | 1 | 2 | OUT0 |
| IN1 | 3 | 4 | OUT1 |
| IN2 | 5 | 6 | OUT2 |
| IN3 | 7 | 8 | OUT3 |
| IN4 | 9 | 10 | OUT4 |
| IN5 | 11 | 12 | OUT5 |
| IN6 | 13 | 14 | OUT6 |
| IN7 | 15 | 16 | OUT7 |
| 0V | 17 | 18 | 0V |
| EXT +24Vin | 19 | 20 | EXT +24Vin |

**JM1**

| | | | |
|---|---|---|---|
| DA0 | 5 | 9 | DA1 |
| GND | 4 | 8 | GND |
| GND | 3 | 7 | GND |
| GND | 2 | 6 | GND |
| DA | 1 | | |

DB9PM

## Specifications (With Matched Wiring Board)

### Motion

- Control type : pulse or analog voltage (MPC3042A)
  pulse (MPC3042AL)
- 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 : 2 28-bit counter
- Pulse Handle Up/Down Counter : 2 28-bit counter
- Linear Interpolation
- Circular Interpolation

### Pulse referenced PI closed loop control (MPC3042A)

- Resolution : 17-bit
- D/A range : +10Vdc ~ -10Vdc
- Error counter : 32-bit
- Digital sample time : 0.25ms
- Proportional gain : 1~4095
- Integral time : 1ms ~ 4095ms
- Feedback multiple vate : x1, x2, x4

### Digital I/O

- Motion Specific Input : SRDY, ALM, LS+(EL+), LS-(EL-), SD, HOME(ORG), PCS, LTC, INP, STA per axis, EMG per card
- Motion Specific Output : CMP, SVON, ERC, FIN per axis
- General Input : 8-bit, photo-isolated
- General Output : 8-bit, photo-isolated
- TTL I/P : 8-bit

### Special I/O

- D/A : 8-bit, 0Vdc ~ 10Vdc (PWM DA)

### Main Card General

- Card ID : 16 position rotary switch
- Insulation Resistance : 100M Ohm (min) at 1000Vdc
- Isolation Voltage : 2500Vac 1Min
- I/O Connector : 68-pin female SCSI-II centronic connector
  25P D type connector
- External Supply : 24Vdc ± 4Vdc
- Operation Temperature : 0 °C ~ +70 °C
- 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 of servo and stepping Motor
- Contouring control
- Precision speed control

## 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

- **MPC3042A :** 2-axis pulse referenced PI closed loop motion control for Servo / Stepping Motor Control (include SM2341104)
- **MPC3042AL :** 2-axis Motion Control Card for Servo / Stepping Motor Control (include SM2341104)
- **ADP2042DIN(N) :** DIN rail mounted wiring board matched MPC3042A/3042AL, General output : 4 NMOS P.17
- **ADP2042DIN(P) :** DIN rail mounted wiring board matched MPC3042A/3042AL, General output : 4 PMOS P.17
- **ADP2042DIN(R) :** DIN rail mounted wiring board matched MPC3042A/3042AL, General output : 4 Relays P.17
- **M2668681541 :** 68-pin SCSI-II centronic cable 1.5 M for JF1 I.18
- **M2668683021 :** 68-pin SCSI-II centronic cable 3.0 M for JF1 I.18
- **JS51050 :** DIN rail mounted dummy wiring board (D type 25P male to terminals) for JM4 I.12
- **M270325X4 :** D type 25P male-female cable 1.5M for JM4 I.17
- **M270325X4S :** D type 25P male-female cable 1.5M, shielding for JM4 I.17
- **M270325X0 :** D type 25P male-female cable 3.0M for JM4 I.17
- **M270325X0S :** D type 25P male-female cable 3.0M, shielding for JM4 I.17
- **ADP9201DIN(R) :** DIN rail mounted wiring board with 16 I/O LED indicators and Relay output for 8 DI, 8 DO for ADP9201_JM1 P.79
- **ADP9201DIN(P) :** DIN rail mounted wiring board with 16 I/O LED indicators and PMOS output for 8 DI, 8 DO for ADP9201_JM1 P.79
- **ADP9201DIN(S) :** DIN rail mounted wiring board with 16 I/O LED indicators and SSR output for 8 DI, 8 DO for ADP9201_JM1 P.79
- **M23207 :** 20-pin flat cable 1.5M for ADP9201_JM1 I.17
- **M23209 :** 20-pin flat cable 3.0M for ADP9201_JM1 I.17
- **FVC01 :** Frequency to voltage module P.23
- **SM2341104 :** Extension kit for JM1 and JM4 (bracket and flat cable for 9p male D type and 25P female D type connector) (MPC3042A only)
- **SM23404 :** Extension kit for JM4 (bracket and flat cable for 25P female D type connector) (MPC3042AL only)