

## PCI express Bus 8-Axis Motion Control Board

PbFree

MC8082Pe is a PCI-bus compliant PC/AT compatible circuit board equipped with 2pcs of 4-axis motion control IC "MCX304". It can independently control 8-axis of either stepper motor or pulse type servo motor for position and speed controls.

● **Independent 8-axis control**

MC8082Pe can control each 8-axis motor independently and simultaneously. The necessary signals, drive pulse output and limit sensor input are assigned to the rear connector. Each signal, encoder input, general output or drive operation, is assigned to the surface connector on the board.

● **Automatic home search**

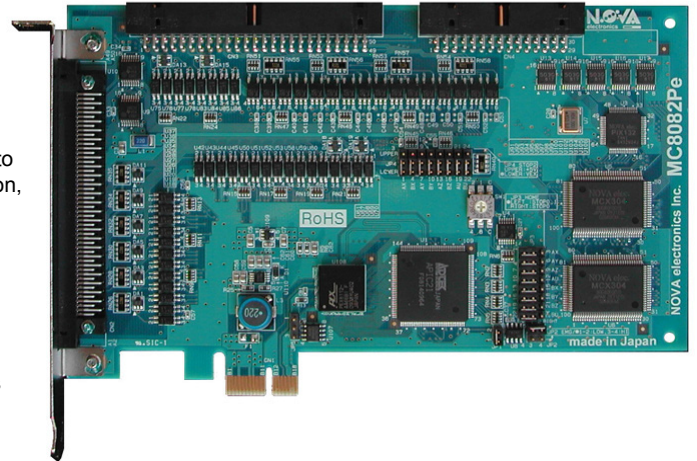
MCX304 has automatic home search function for all axis. It saves the load of user program drastically.

● **Smooth s-curve driving**

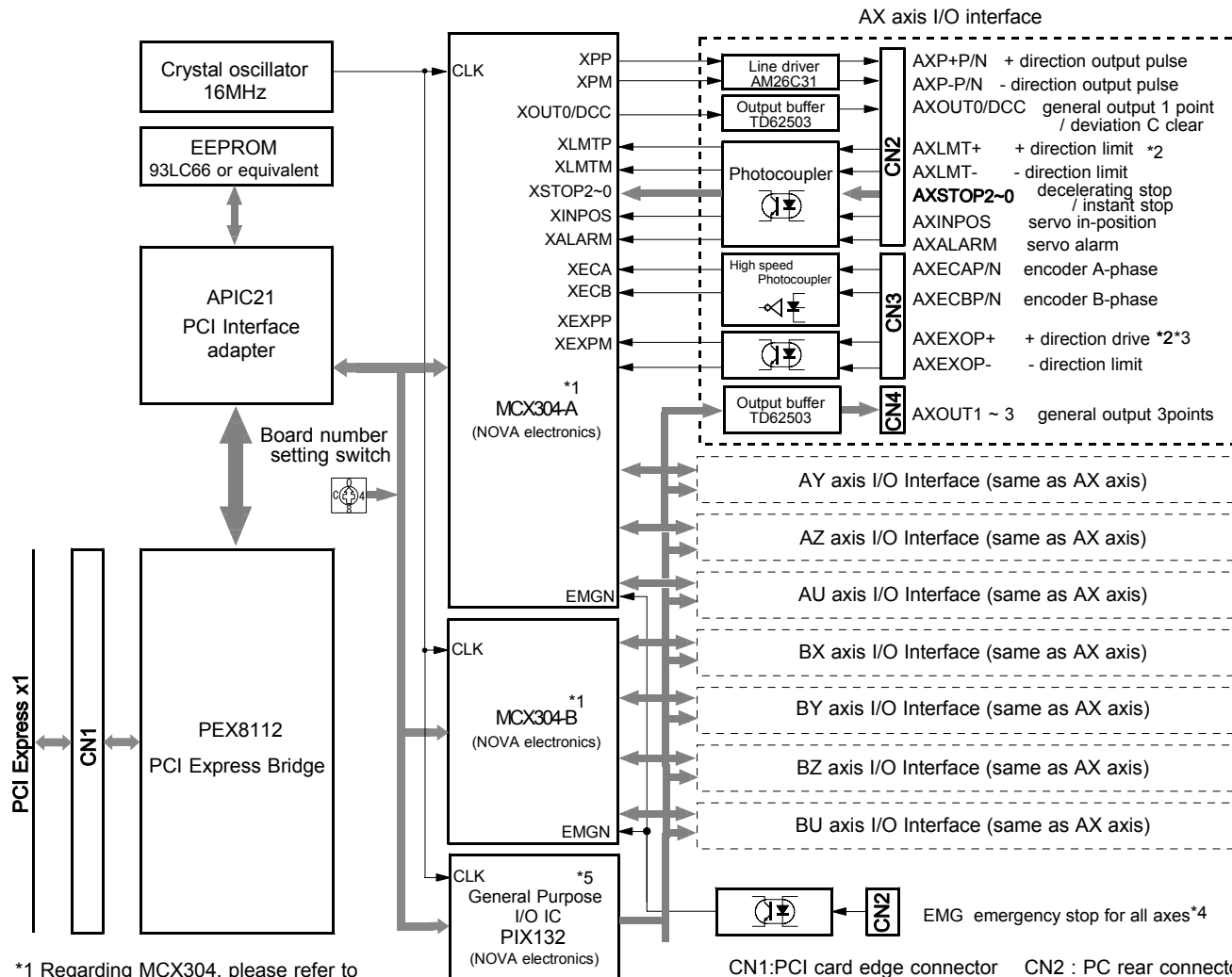
In addition to linear acceleration/deceleration drive, it can operate parabolic s-curve acceleration/deceleration drive. S-curve drive can keep its smoothness even though the number of output pulse is small.

● **Compatible with MC8082P**

Compatible with PCI bus board, MC8082P

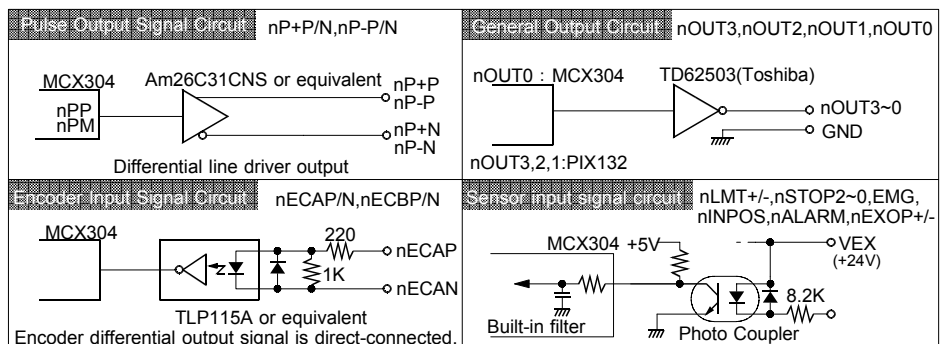


### Circuit Block Diagram and I/O Signal



\*1 Regarding MCX304, please refer to the catalog and user's manual of MCX304. MC8082Pe does not support the general output signals of MCX304, nOUT1 ~ 3. However, it's equipped with PIX132, each 4 axis has general output (MCX304-OUT0, PIX132-OUT1,2,3).  
 \*2 Sensor input signals as +/- direction limit are isolated by PhotoCoupler. DC 12 ~ 24V external power supply is needed to drive these signals.  
 \*3 nEXOP+/- (+/- direction drive) is the input signal which can control fixed pulse and continuous driving of each axis externally.  
 \*4 The driving logic of EMG (Emergency stop) signal can be changed by jumper on MC8082P.  
 \*5: Only output ports of PIX132 are used.

CN1: PCI card edge connector CN2 : PC rear connector  
 CN3,4: Connectors on the board



## Specifications

■ <b>Control Axis</b>	8 axes (Independent, Simultaneous Control)
■ <b>Interface</b>	PCI Express ×1
■ <b>Data bit width</b>	16 bit
■ <b>Occupied I/O address</b>	64 byte (Depend on Plug and Play function.)
■ <b>Interrupt</b>	IRQ (Depend on Plug and Play function.)

### Common specifications for each axis

#### ■ Drive Pulse Output

- Pulse output circuit Differential line-drive (AM26C31) output
- Pulse output speed 1PPS ~ 4MPPS
- Pulse output speed accuracy ±0.1% (Depend on the setting speed)
- S-curve Jerk  $954 \sim 31.25 \times 10^9 \text{PPS/SEC}^2$
- Accelerating/Decelerating speed  $125 \sim 500 \times 10^6 \text{PPS/SEC}$
- Drive speed  $1 \sim 4 \times 10^6 \text{PPS}$
- Output-pulse number 0 ~ 268,435,455 (Fixed pulse drive)  
or Unlimited (Continuous drive)
- Speed curve  
Constant speed, symmetrical/non-symmetrical linear acceleration,  
symmetrical/non-symmetrical parabolic s-curve acceleration/deceleration drive.
- Fixed Pulse Drive deceleration mode  
Auto (non-symmetrical linear acceleration/deceleration is also allowed)/Manual
- Output-pulse numbers and drive speeds are changeable during the driving.
- Independent 2-pulse system or 1-pulse 1-direction system is selectable.
- Logical levels of drive pulse is selectable.

#### ■ Encoder A/B phase Input

- Input Circuit High-speed photo coupler input.  
Connectable with differential line-driver.
- 2-phase pulse style or Up / Down pulse style is selectable.
- Pulse of each single, double or quad count edge evaluation is selectable.  
(2-phase pulse style).

#### ■ Position Counter

- Logic Position Counter (for output pulse) range Bit length: 32 bit
- Real Position Counter (for feedback pulse) range Bit length: 32 bit  
To read/write data is always possible.

#### ■ Comparison Register

- COMP+ Register comparison range  $-1,073,741,824 \sim +1,073,741,823$
- COMP- Register comparison range  $-1,073,741,824 \sim +1,073,741,823$
- Status and signal outputs for the comparisons of position counters
- To work as Software limit

#### ■ Automatic home search

- Automatic execution of Step 1 (high-speed near home search) →  
Step 2 (low-speed home search) →  
Step 3 (low-speed encoder Z-phase search) →  
Step 4 (high-speed offset drive).
- Enable/Disable of each step and search direction is selectable.
- Deviation counter clear output :  
Clear pulse width within the range of 10μ~20msec and logical level is selectable.

#### ■ Interrupt

- The factors of occurring interrupt:  
..start/finish of a constant-speed drive during the acceleration/deceleration driving  
..end of the driving  
..transition to "position counter ≥ COMP-"  
..transition to "position counter < COMP-"  
..transition to "position counter ≥ COMP+"  
..transition to "position counter < COMP+"  
Enable/disable for these factors are selectable.

#### ■ External Signal for Driving

- EXOP+ and EXOP- signals for fixed/continuous drive
- Input Circuit Photo coupler and IC built-in integral filter

#### ■ External Decelerating/Instant Stop Signal

- STOP0~2 3 points for each axis (STOP0:near home,  
STOP1:home, STOP2:encoder Z-phase input)
- Input Circuit Photo coupler and IC built-in integral filter  
Enable/disable and logical levels for each signal is selectable.

#### ■ Servo Motor Input Signal

- ALARM (Alarm), INPOS (In Position Check)
- Input Circuit Photo coupler and IC built-in integral filter  
Enable/disable and logical levels for each signal is selectable.

#### ■ Servo Motor Output Signal

- DCC (Pin shared between deviation counter clear output and OUT0)
- Output Circuit TD62503 output (open collector output)

#### ■ General Output Signal

- OUT0~3 4 points for each axis (Total: 4×8=32 points)
- Output Circuit TD62503 output (open collector output)

#### ■ Limit Signals Input

- 1 point for each + and - direction
- Input Circuit Photo coupler and IC built-in integral filter  
Logical levels and decelerating/instant stop is selectable.

#### ■ Emergency Stop Signal Input

- EMG 1 point for all axes. Stop the drive pulse immediately for all axes.
- Input Circuit Photo coupler and IC built-in integral filter  
Logical level is selectable by jumper on the board.

#### Software

##### ■ For Windows XP (32bit), Vista (32/64bit), and 7 (32/64bit)

- Device driver for MC8000P
- VC++, VB and C# Sample program
- Evaluation tool program

Software and user's manual are not attached to MC8082Pe.  
Please contact us or our distributor directly when you need.  
You can also download it on our website.

[http://www.novaelec.co.jp/eng/index\\_e.html](http://www.novaelec.co.jp/eng/index_e.html)

#### Others

- Temperature Range for Driving  $0 \sim +45^\circ\text{C}$  (No condensation)
- Power Voltage for Driving  $+3.3\text{V} \pm 5\%$   
(Consumption current 1300mA max.)
- External Supply Voltage +24V
- Board Dimensions  $174.6 \times 106.7\text{mm}$   
(Connectors and brackets are excluded)
- I/O Connector Type CN2:FX2B-100PA-1.27DS (Hirose)  
CN3:HIF3FC-50PA-2.54DS (Hirose)  
CN4:HIF3FC-30PA-2.54DS (Hirose)
- Accessories CN2:FX2B-100SA-1.27R (Hirose) with 1.2m cable  
CN3:HIF3BB-50D-2.54R (Hirose) connector only  
CN4:HIF3BA-30D-2.54R (Hirose) connector only

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The specifications are subject to change without notice due to the technical development. 2013.2

Distributor



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