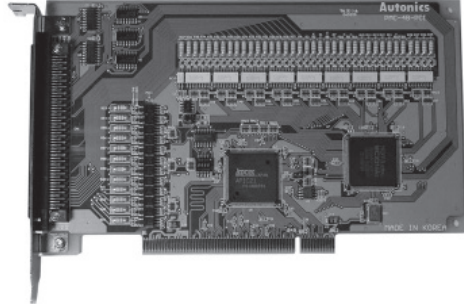


Autonics Programmable Motion Controller

PMC-4B-PCI

M A N U A L



Thank you very much for selecting Autonics products.
For your safety, please read the following before using.

Caution for your safety

※ Please keep these instructions and review them before using this unit.

※ Please observe the cautions that follow;

Warning Serious injury may result if instructions are not followed.

Caution Product may be damaged, or injury may result if instructions are not followed.

※ The following is an explanation of the symbols used in the operation manual.

Warning Injury or danger may occur under special conditions.

Warning

1. In case of using this unit with machinery (Ex: nuclear power control, medical equipment, ship, vehicle, train, airplane, combustion apparatus, safety device, crime/disaster prevention equipment, etc.) which may cause damages to human life or property, it is required to install fail-safe device.

It may cause a fire, human injury or damage to property.

2. Use this unit in the rated environment. Avoid using this unit where flammable or explosive gas or, high temperature and humidity, or vibration exists. It may cause fire, deterioration, malfunction, or damage to the product.

It may cause a fire, human injury, or damage to property.

3. Do not disassemble or modify this unit.

It may cause a fire, human injury or damage to property.

4. Do not cut off the power during operating.

It may cause human injury, damage to property, or malfunction.

5. Emergency stop should be available during operating.

It may cause human injury, or damage to the product.

6. Do not remove connector and jumper pin during operating.

It may cause human injury, damage to property, or malfunction.

7. Regard this product as industrial waste when discarding it.

It may cause human injury, damage to property.

8. Mount this unit on PCI bus connector.

It may cause a fire or human injury.

9. Wire the connection as the connection diagram.

It may cause a fire or electric shock or damage to this unit.

10. Install the limit switch.

It may cause human injury, or damage to property.

11. Install the emergency switch.

Caution

1. Do not connection, inspect or repair this unit when it is power on.

It may cause electric shock or malfunction.

2. Do not repair this unit. Please contact us if it is required.

It may cause a fire or electric shock.

3. Please observe the rated specification.

It may cause shorten the product or a fire.

4. In cleaning the unit, do not use water or organic solvent. And use dry cloth.

It may cause electric shock, a fire or damage to the product.

5. Do not inflow dust or wire dregs into the unit.

It may cause electric shock, a fire or damage to the product.

6. After using this product and for storage, remove the I/O cable from the PC and pack this unit with wrapping paper for preventing static electricity. Keep this unit within the rated temperature and humidity.

7. Turn OFF the power during installing or wiring.

It may cause electric shock or damage to the product.

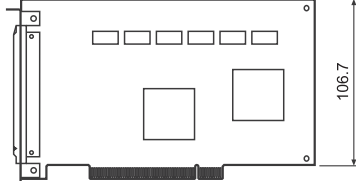
8. Be sure not to short the each other cable during installing and wiring.

It may cause electric shock or damage to the product.

9. Do not wire to the unused terminal and be sure that not to short with the other terminals.

It may cause electric shock or damage to the product.

Dimensions



(Unit: mm)

※The above specifications are subject to change and some models may be discontinued without notice.

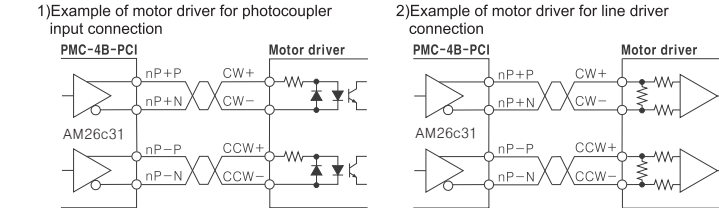
Specifications

| | |
|--|---|
| Model | PMC-4B-PCI |
| Control axis | 4-axis |
| Power supply | 5VDC (uses PC inner power) |
| External power supply | 12-24VDC |
| Allowable voltage range | 90 to 110% of rated voltage |
| CPU data bus length | Selectable 8/16 bit |
| 2/3-axis linear interpolation | Interpolation range: -2,147,483,648 to 2,147,483,647 for each axis Interpolation speed: 1pps to 4Mpps Position accuracy: Max ±0.5 LBS(within all interpolation range) |
| Circular interpolation | Interpolation range: Uses PC inner power Interpolation speed: 1pps to 4Mpps Position accuracy: Max ±1 LBS(within all interpolation range) |
| 2/3-axis bit pattern interpolation speed | 1pps to 4Mpps(Depends on CPU data setup time) |
| Other interpolations | Selectable the axis, constant linear velocity, consecutive interpolation, interpolation step transmission (COMMAND, external signal) |
| Drive pulse output | Output circuit range: 1pps to 4Mpps Output speed accuracy: Max. ±0.1%(for SV) Speed magnification: 1 to 500 S jerk speed: 954 to 62.5×10 ³ pps/sec(Mag.=1) (Accel/Decel increase rate) 477×10 ³ to 31.25×10 ³ pps/sec(Mag.=500) Accel/Decel: 125 to 1×10 ³ pps/sec(Mag.=1) 62.5×10 ³ to 500×10 ³ pps/sec(Mag.=500) Initial velocity: 1 to 8,000pps(Mag.=1)/500 to 4×10 ³ pps(Mag.=500) Drive speed: 1 to 8,000pps(Mag.=1)/500 to 4×10 ³ pps(Mag.=500) Number of output pulses: 0 to 4,294,967,295(Fixed pulse drive) |
| X, Y-axis common specifications | Speed curve: Constant speed/Symmetric, Asymmetric linear accel/decel/Parabola S curve drive Fixed pulse drive deceleration mode auto deceleration (asymmetric linear accel/decel function)/Manual deceleration Changeable output pulse for driving, drive speed Selectable individual 2-pulse/1-pulse direction method Selectable drive pulse logic level, changeable output terminal |
| Encoder input pulse | Inputable 2-phase pulse/Up-Down pulse, Selectable 2-phase pulse 1, 2, 4 multiply Logical position counter (for output pulse) count range: -2,147,483,648 to 2,147,483,647 |
| Position counter | Actual position counter (for input pulse) count range: -2,147,483,648 to 2,147,483,647 |
| Compare register | Comp. +register position comparison range: -2,147,483,648 to -2,147,483,647 Comp. -register position comparison range: -2,147,483,648 to -2,147,483,647 Status output for position counter size, signal output Enables to operate as software limit |
| Auto home search | Step1 (High speed near home search)--Step2 (Low speed near home search) 1 drive pulse output When changes position counter ≥ Comp.-, When changes position counter ≤ Comp.+ When changes position counter < Comp.-, When changes position counter > Comp.+ When starting constant speed in accel/decel drive, when ending constant speed in accel/decel drive When ending drive, when ending auto home search, Synchronous operation |
| Interrupt function (except interpolation) | |
| Drive adjustment by external signal | Enable to fixed/continuous pulse drive of +/- direction by EXP+/EXP- signal Enable to drive 2-phase encoder signal mode (Encoder input) |
| External deceleration stop/immediate stop signal | IN 0 to 3 each axis 4-point Selectable signal valid/invalid and logical level, usable as general input |
| Input signal for servo motor | Selectable alarm, INPOS signal valid/invalid and logic level |
| General output signal | OUT 4 to 7 each axis 4-point (Uses same terminal with drive status output signal) |
| Drive status signal output | ASND (Accelerating), DSND (Decelerating) |
| Overrun limit signal input | Selectable + direction, - direction each 1-point and logic level At active, selectable immediate stop/decelerate stop |
| Emergency stop signal input | EMG 1-point, stops drive pulse of all axes by low level |
| Integral filter | Built-in integral filter at each input signal input terminal, selectable pass time (8 types) |
| Others | Selectable the axis, constant linear velocity, consecutive interpolation, interpolation step transmission (COMMAND, external signal) |
| Environment | Ambient temperature: 0 to 45°C, Storage temperature: -10 to 55°C Ambient humidity: 35 to 85%RH, Storage humidity: 35 to 85%RH |
| Approval | CE |
| Unit weight | Approx 98g |

Connections

1. Drive pulse output signal connection (nP+/P/N, nP-/P/N)

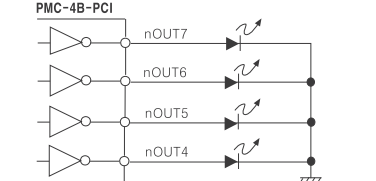
Driver pulse outputs drive pulse signal of +direction/-direction by line driver(AM26c31) of differential motion output. This is the connection example of motion driver which has photo coupler and line driver input.



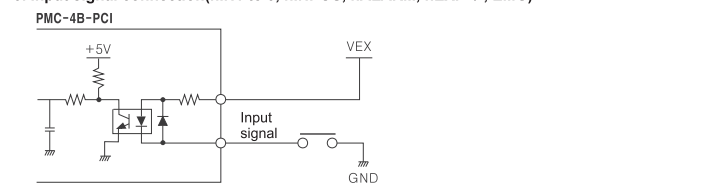
※For driver pulse output signal, use twisted pair shield cable considering EMC.

2. General output signal connection (nOUT7 to 4)

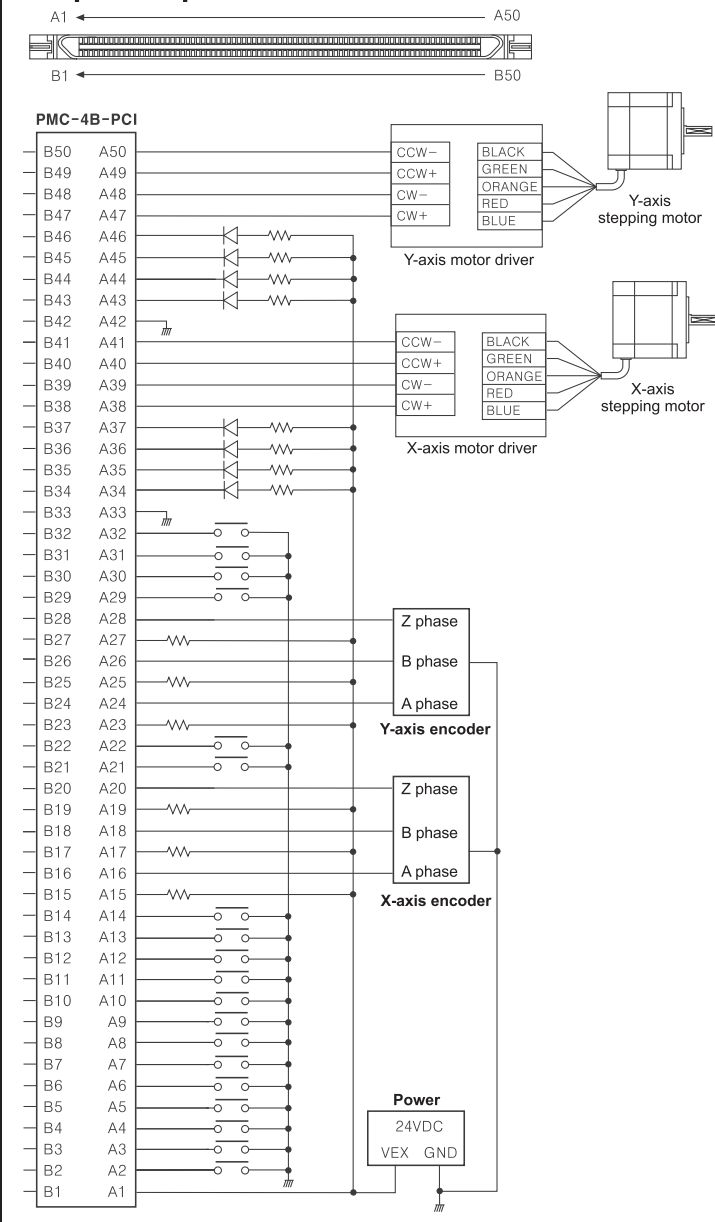
Output signal outputs as buffer(74LS06). After reset, all outputs are OFF.



3. Input signal connection (nIN1 to 3, nINPOS, nALARM, nEXP+/-, EMG)



Input/Output connection



Input/Output specifications

| No | Pin name | Pin description | No | Pin name | Pin description |
|-----|------------|--|-----|------------|--|
| A1 | VEX | 12-24 VDC | B1 | VEX | 12-24VDC |
| A2 | EMG | Emergency stop(4-axis stop) | B2 | - | - |
| A3 | XLIMIT+ | X-axis + direction limit | B3 | ZLIMIT+ | Z-axis + direction limit |
| A4 | XLIMIT- | X-axis - direction limit | B4 | ZLIMIT- | Z-axis - direction limit |
| A5 | XIN1 | X-axis input signal(home signal) | B5 | ZIN1 | Z-axis input signal(home signal) |
| A6 | XIN0 | X-axis input signal (near home signal) | B6 | ZIN0 | Z-axis input signal (near home signal) |
| A7 | XIN3 | X-axis input signal (Encoder Z phase signal) | B7 | ZIN3 | Z-axis input signal (Encoder Z phase signal) |
| A8 | YLIMIT+ | Y-axis +direction limit | B8 | ULIMIT+ | U-axis +direction limit |
| A9 | YLIMIT- | Y-axis -direction limit | B9 | ULIMIT- | U-axis -direction limit |
| A10 | YIN1 | Y-axis input signal(home signal) | B10 | UIN1 | U-axis input signal(home signal) |
| A11 | YIN0 | Y-axis input signal(near home signal) | B11 | UIN0 | U-axis input signal(near home signal) |
| A12 | YIN3 | Y-axis input signal (Encoder Z phase signal) | B12 | UIN3 | U-axis input signal (Encoder Z phase signal) |
| A13 | XINPOS | X-axis inposition input | B13 | ZINPOS | Z-axis inposition input |
| A14 | XALARM | X-axis alarm input | B14 | ZALARM | Z-axis alarm input |
| A15 | XECAP | X-axis Encoder A phase+ | B15 | ZECAP | Z-axis Encoder A phase+ |
| A16 | XECAN | X-axis Encoder A phase- | B16 | ZECAN | Z-axis Encoder A phase- |
| A17 | XECBP | X-axis Encoder B phase+ | B17 | ZECBP | Z-axis Encoder B phase+ |
| A18 | XECBN | X-axis Encoder B phase- | B18 | ZECBN | Z-axis Encoder B phase- |
| A19 | XECZP | X-axis Encoder Z phase+ | B19 | ZECZP | Z-axis Encoder Z phase+ |
| A20 | XECZN | X-axis Encoder Z phase- | B20 | ZECZN | Z-axis Encoder Z phase- |
| A21 | YINPOS | Y-axis inposition input | B21 | UINPOS | U-axis inposition input |
| A22 | YALARM | Y-axis alarm input | B22 | UALARM | U-axis alarm input |
| A23 | YECAP | Y-axis Encoder A phase+ | B23 | UECAP | U-axis Encoder A phase+ |
| A24 | YECAN | Y-axis Encoder A phase- | B24 | UECAN | U-axis Encoder A phase- |
| A25 | YECBP | Y-axis Encoder B phase+ | B25 | UECBP | U-axis Encoder B phase+ |
| A26 | YECBN | Y-axis Encoder B phase- | B26 | UECBN | U-axis Encoder B phase- |
| A27 | YECZP | Y-axis Encoder Z phase+ | B27 | UECZP | U-axis Encoder Z phase+ |
| A28 | YECZN | Y-axis Encoder Z phase- | B28 | UECZN | U-axis Encoder Z phase- |
| A29 | XEXP+ | X-axis manual + drive | B29 | ZEXP+ | Z-axis manual + drive |
| A30 | XEXP- | X-axis manual - drive | B30 | ZEXP- | Z-axis manual - drive |
| A31 | YEXP+ | Y-axis manual + drive | B31 | UEXP+ | U-axis manual + drive |
| A32 | YEXP- | Y-axis manual - drive | B32 | UEXP- | U-axis manual - drive |
| A33 | GND | GND | B33 | GND | GND |
| A34 | XOUT4/CMPP | X-axis general output | B34 | ZOUT4/CMPP | Z-axis general output |
| A35 | XOUT5/CMPP | X-axis general output | B35 | ZOUT5/CMPP | Z-axis general output |
| A36 | XOUT6/ASND | X-axis general output | B36 | ZOUT6/ASND | Z-axis general output |
| A37 | XOUT7/DSND | X-axis general output | B37 | ZOUT7/DSND | Z-axis general output |
| A38 | XP+P | X-axis +direction +drive signal output | B38 | ZP+P | Z-axis +direction +drive signal output |
| A39 | XP+N | X-axis +direction -drive signal output | B39 | ZP+N | Z-axis +direction -drive signal output |
| A40 | XP-P | X-axis -direction +drive signal output | B40 | ZP-P | Z-axis -direction +drive signal output |
| A41 | XP-N | X-axis -direction -drive signal output | B41 | ZP-N | Z-axis -direction -drive signal output |
| A42 | GND | GND | B42 | GND | GND |
| A43 | YOUT4/CMPP | Y-axis general output | B43 | UOUT4/CMPP | U-axis general output |
| A44 | YOUT5/CMPP | Y-axis general output | B44 | UOUT5/CMPP | U-axis general output |
| A45 | YOUT6/ASND | Y-axis general output | B45 | UOUT6/ASND | U-axis general output |
| A46 | YOUT7/DSND | Y-axis general output | B46 | UOUT7/DSND | U-axis general output |
| A47 | YP+P | Y-axis +direction +drive signal output | B47 | UP+P | U-axis +direction +drive signal output |
| A48 | YP+N | Y-axis +direction -drive signal output | B48 | UP+N | U-axis +direction -drive signal output |
| A49 | YP-P | Y-axis -direction +drive signal output | B49 | UP-P | U-axis -direction +drive signal output |
| A50 | YP-N | Y-axis -direction -drive signal output | B50 | UP-N | U-axis -direction -drive signal output |

Manual and software

Visit our website (www.autonics.com) to download the user manual, I/O test program, Labview library and help, C-language library and examples.

Caution for using

- Caution for before starting motion controller**
 - Before starting this motion controller, set the position coordinate and several parameters for the using environment properly.
 - When using jog or continuous mode, set the proper start speed to increase system speed continuously.
 - Caution for ID Select S/W input**
 - When using several this units in one PC, set the switch differently by each other board.
 - It is available to use up to 16 boards at same time.
 - Installation environment**
 - It shall be used indoor.
 - Pollution degree II
 - Altitude Max. 2000m
 - Installation category II
- ※It may cause malfunction if above instructions are not followed.

Major products

- Photoelectric sensors
- Fiber optic sensors
- Door sensors
- Door side sensors
- Area sensors
- Proximity sensors
- Pressure sensors
- Rotary encoders
- Connector/Sockets
- Switching mode power supplies
- Control switches/Lamps/Buzzers
- I/O Terminal Blocks & Cables
- Stepper motors/drivers/motion controllers
- Graphic/Logic panels
- Field network devices
- Laser marking system(Fiber, CO₂, Nd:YAG)
- Laser welding/soldering system
- Temperature controllers
- Temperature/Humidity transducers
- SSR/Power controllers
- Counters
- Timers
- Panel meters
- Tachometer/Pulse(Rate) meters
- Display units
- Sensor controllers

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