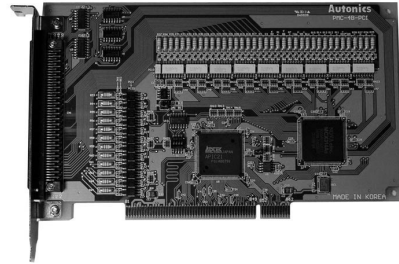


4-axis Board Type Programmable Motion Controller

■ Features

- Available to control 4-axis independent AC servo motor and stepper motor
- PC-PCI card
- Auto home search and synchronous operation
- Interpolation on circular/linear, bit pattern/continuous/ accel/deceleration drive
- 2/3-axis constant linear velocity.
- Compatible with windows 98, NT, 2000, XP, 7
- Supports Labview library and help, C language library and examples (download at Autonics website)



※ Visit our website (www.autonics.com) to download manual and software.

⚠ Please read "Safety Considerations" in the instruction manual before using.



■ Software (atMotion)

atMotion is the windows software designed to operate motion control for motion device.

- Compatible with Microsoft Windows 98, NT, XP (32-bit, 64-bit), Vista (32-bit, 64-bit), 7 (32-bit, 64-bit), 8 (32-bit, 64-bit) and 10 (32-bit, 64-bit)
- Supports 1200, 2400, 4800, 9600, 19200, 38400, 57600, 115200 bps communication speeds
- Available to use on all OS supported COM ports (COM1 to COM256)
- Multilingual support (korean, english)
- Provides the calculator for convenience (calculates PPS, center of interpolation, end coordinates)

■ Ordering Information

PMC - 4B - PCI		
	Connection type	PCI PCI
	Axis/Type	4B 4-axis board type
Item		PMC Programmable motion controller


■ Specifications

Model	PMC-4B-PCI	
Control axes	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	8/16-bit selectable	
2/3-axis linear interpolation	Range	-2,147,483,648 to 2,147,483,647 for each axis
	Speed	1pps to 4Mpps
	Position accuracy	Max. ±0.5LSB (within all interpolation range)
Circular interpolation	Range	-2,147,483,648 to 2,147,483,647 for each axis
	Speed	1pps to 4Mpps
	Position accuracy	Max. ±1 LSB (within all interpolation range)
2/3-axis bit pattern interpolation speed	1 to 4Mpps (depends on CPU data setup time)	
Other interpolations	Selectable the axis, constant linear velocity, consecutive interpolation, interpolation step transmission (command, external signal)	
Driver pulse output (X, Y-axis common specifications)	Output speed range: 1pps to 4Mpps	
	Output speed accuracy: max ±0.1% (for setting value)	
	Speed magnification: 1 to 500	
	S jerk speed: 954 to 62.5×10 ⁶ pps/sec (mag.=1) (accel/decel increase rate) 477×10 ³ to 31.25×10 ⁹ pps/sec (mag.=500)	
	Accel/Decel: 125 to 1×10 ⁶ pps/sec (mag.=1) 62.5×10 ³ to 500×10 ⁶ pps/sec (mag.=500)	
	Initial velocity: 1 to 8,000pps (mag.=1) / 500 to 4×10 ⁶ pps (mag.=500)	
	Drive speed: 1 to 8,000pps (mag.=1) / 500 to 4×10 ⁶ pps (mag.=500)	
	Number of output pulses: 0 to 4,294,967,295 (fixed pulse drive)	
	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	Inputtable 2-phase pulse/Up-Down pulse, selectable 2-phase pulse 1/2/4 multiply	

SENSORS
CONTROLLERS
MOTION DEVICES
SOFTWARE

(Y) Closed Loop Stepper System
(Z) Stepper Motors
(AA) Drivers
(AB) Motion Controllers

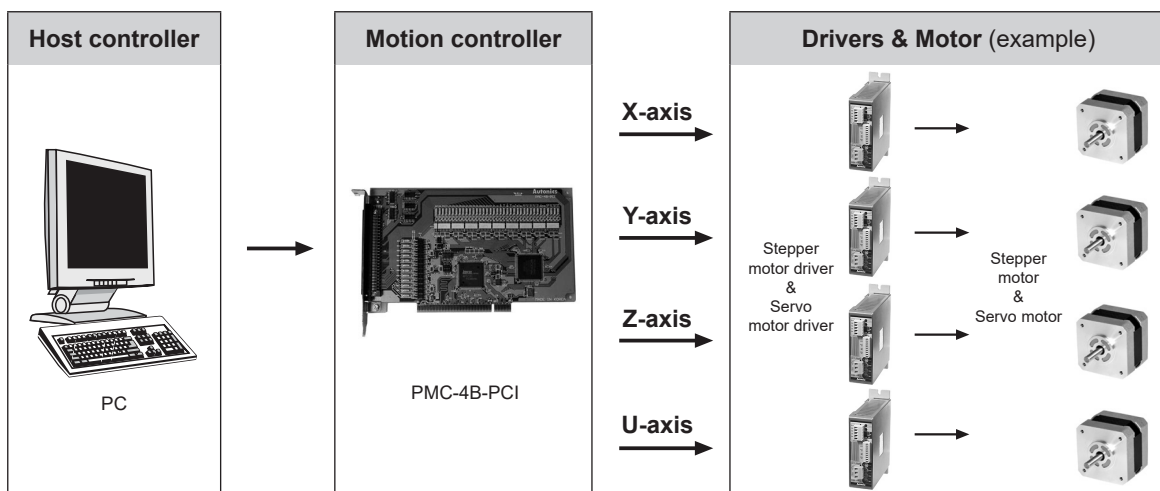
■ Specifications

Position counter	Logic position counter (for output pulse) count range: -2,147,483,648 to +2,147,483,647 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	
	Output/Signal output when the present value of the counter and the user position counter are same by comparing Enables to operate as software limit	
Auto home search	High speed near home search (Step1) → Low speed near home search (Step2)	
Interrupt function (except interpolation)	1 drive pulse output when changing position counter \geq Comp.-, when changing position counter \geq Comp.+, when changing position counter $<$ Comp.-, when changing 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, when running synchronous operation	
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: -10 to 55°C
	Ambient humidity	35 to 85%RH, storage: 35 to 85%RH
Approval		
Weight ^{※1}	Approx. 654.4g (approx. 100.4g)	

※1: The weight includes packaging. The weight in parenthesis is for unit only.

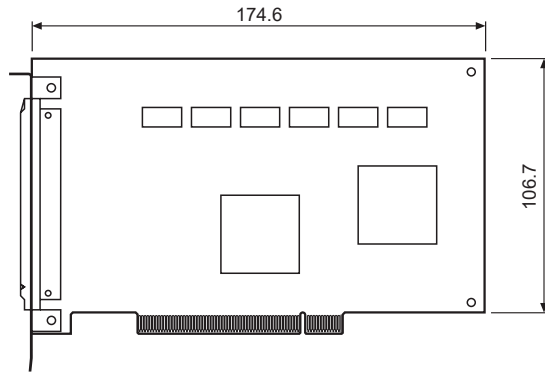
※Environment resistance is rated at no freezing of condensation.

■ System



4-axis Motion Controller

■ Dimensions



(unit: mm)

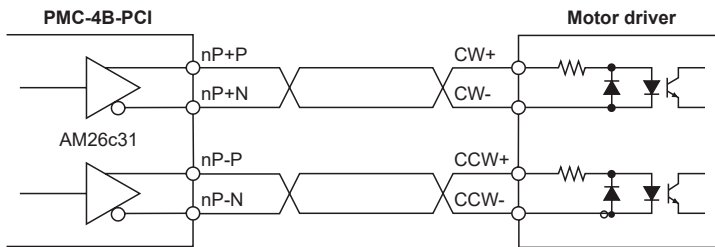
SENSORS
CONTROLLERS
MOTION DEVICES
SOFTWARE

■ Connections

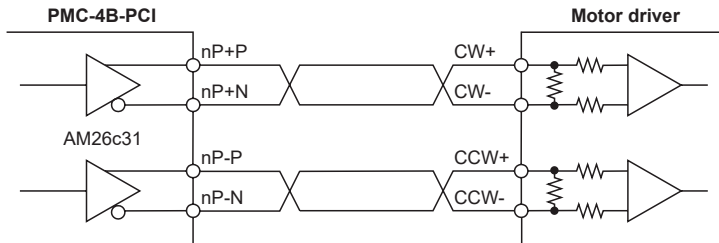
◎ Connection of pulse output signal (nP+P/N, nP-P/N)

Drive pulse output generates drive pulse signal of +/- direction using line driver (AM26c31) of differential output. Followings are examples of connection with motor drivers with photocoupler or line driver input.

● Example for the connection with a motor driver of photocoupler input



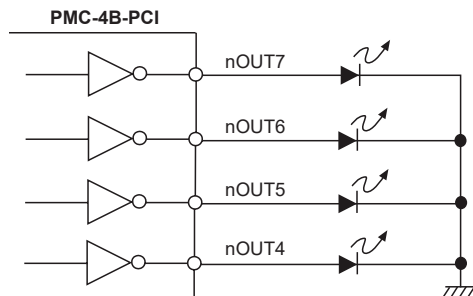
● Example for the connection with a motor driver of line driver



※It is recommended to use twisted pair shield wire for pulse output signal of driver operation regarding EMC.

◎ Connection of common output signal (nOUT4 to 7)

Output signal is outputted by buffer (74LS06), and all outputs are OFF after reset.



(Y)
Closed Loop
Stepper System

(Z)
Stepper Motors

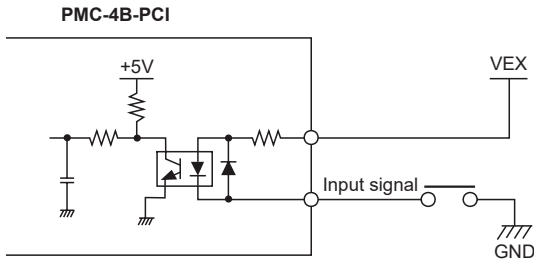
(AA)
Drivers

(AB)
Motion
Controllers

PMC-4B-PCI

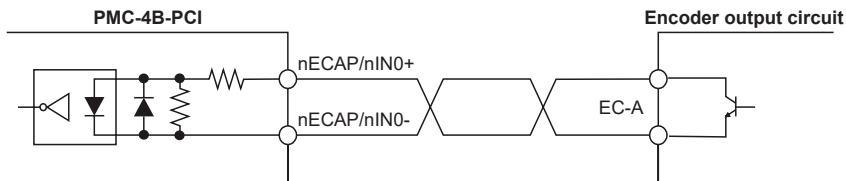
■ Connections

◎ Connection of input signal (nIN1 to 3, nINPOS, nALRAM, nEXP+/-, EMG)

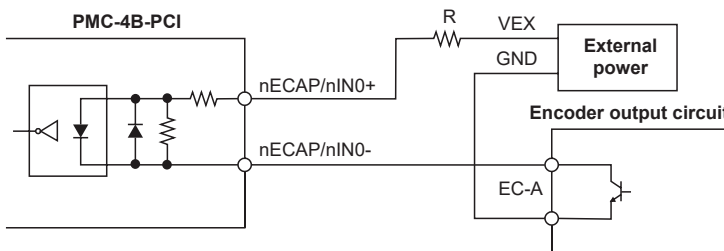


◎ Connection of encoder input signal (nECAP/N, nECBP/N) and nINO+/- signal

- Example for the connection with line driver of differential output



- Example for the connection with encoder of NPN open collector output

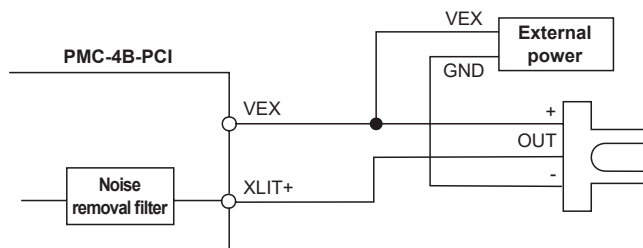


External voltage	Resistance (R)
5V	0
12V	820Ω 1/4W
24V	2kΩ 1W

※Encoder A, B, Z phase are same connection.

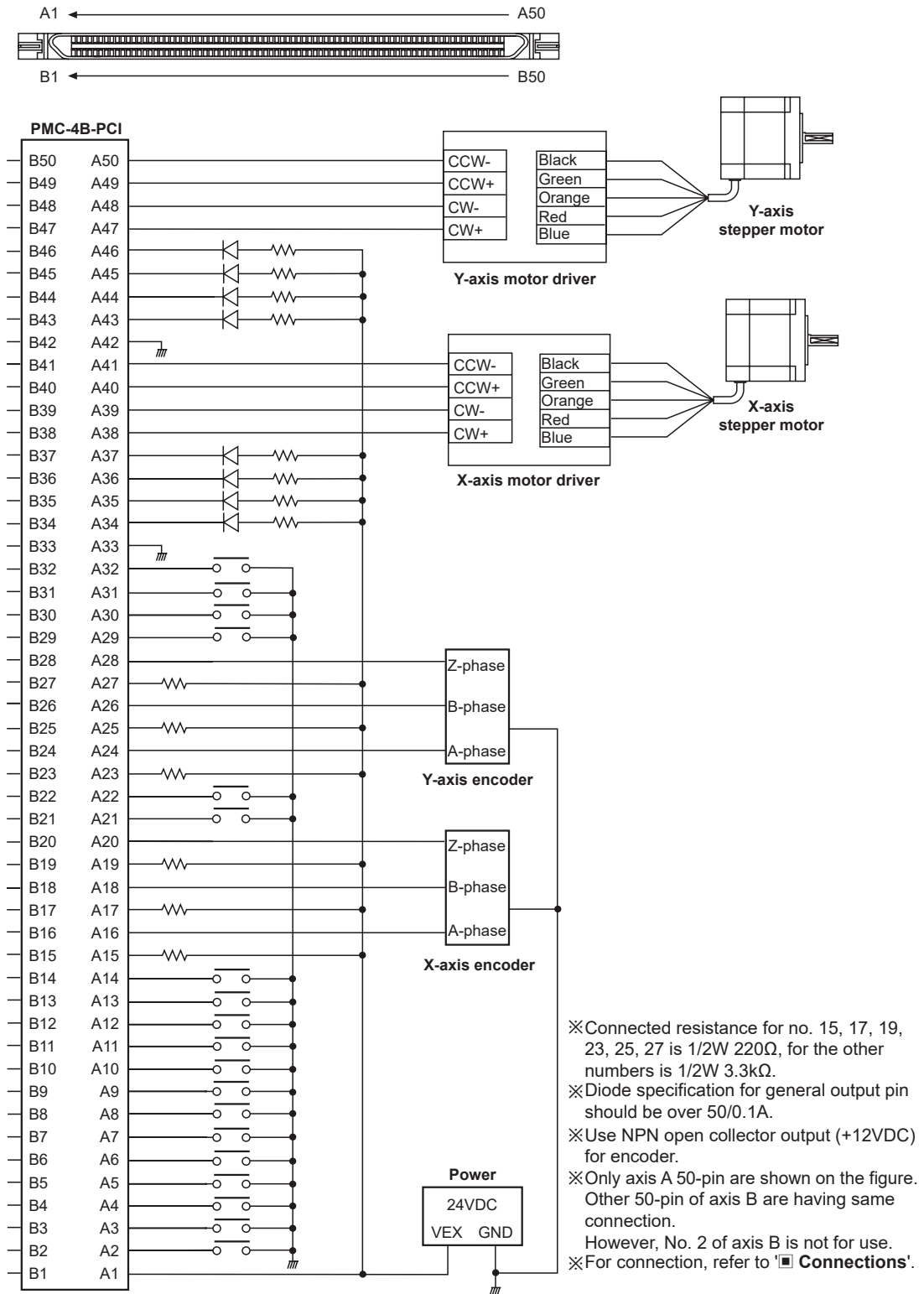
◎ Connection of limit input signal (nLMIT+/-)

The outgoing cable of limit signal can be affected by noise. Since it can not be removed only with photocoupler, the filter circuit is built in PMC-4B-PCI. Please set enough passing time (FL=2, 3).



4-axis Motion Controller

Input/Output Connections



SENSORS
CONTROLLERS
MOTION DEVICES
SOFTWARE
(Y) Closed Loop Stepper System
(Z) Stepper Motors
(AA) Drivers
(AB) Motion Controllers

Input/Output Specifications

Pin no.	Signal	Description	Pin no.	Signal	Pin description
A1	VEX	12-24VDC	B1	VEX	12-24VDC
A2	EMG	Emergency stop (4-axis stop)	B2	-	N-C
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 In-Position input	B13	ZINPOS	Z-axis In-Position 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 In-Position input	B21	UINPOS	U-axis In-Position 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/CMPM	X-axis general output	B35	ZOUT5/CMPM	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/CMPM	Y-axis general output	B44	UOUT5/CMPM	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