

# PMC-1HS/PMC-2HS Series

## 1-2-Axis High Speed Programmable Motion Controller

### ■ Features

- Max. 4Mpps high-speed operation
- 4 operation modes: Jog, Continuous, Index, Program mode
- 12 control command and 64 steps of operations
- Parallel I/O terminal built in which is connectable on PLC
- Create and edit operating programs, parameters by dedicated software
- Easy to operation of X, Y stage with joy stick
- RS232C port for all types
- Teaching and monitoring function by using teaching unit (PMC-2TU-232, sold separately)

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



### ■ Manual

For the detail information and instructions, please refer to user manual and be sure to follow cautions written in the technical descriptions

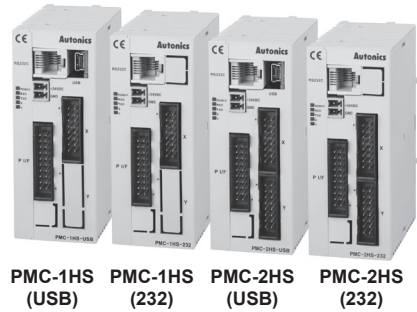
### ■ Software (atMotion)

- atMotion is a comprehensive motion device management program that can be used with Autronics motion controllers.
- atMotion provides GUI control for easy and convenient parameter setting and monitoring data management of multiple devices.

< Computer specification for using software >

Item	Minimum requirements
System	IBM PC compatible computer with Intel Pentium III or above
Operations	Microsoft Windows 98/NT/XP/Vista/7/8/10
Memory	256MB+
Hard disk	1GB+ of available hard disk space
VGA	Resolution: 1024×768 or higher
Others	RS-232 serial port (9-pin), USB port

< atMotion screen >



SENSORS
CONTROLLERS
<b>MOTION DEVICES</b>
SOFTWARE

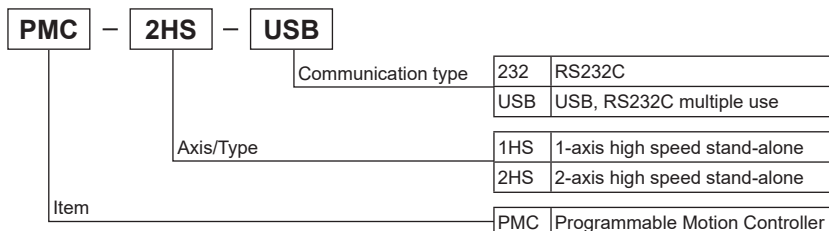
(Y) Closed Loop Stepper System
(Z) Stepper Motors
(AA) Drivers
<b>(AB) Motion Controllers</b>

### ■ Standard Operation Method

There are four methods to operate PMC-1HS/PMC-2HS.

- Start with PC
  - Connect a PC and the motion controller body via a communication cable, starts the operation program.
- Start with Parallel I/F
  - Connect a sequence controller or switch to the Parallel I/F.
- Start with teaching unit (PMC-2TU-232, sold separately)
  - Connect a communication cable annexed to a teaching unit (PMC-2TU-232).
  - It is available to execute Jog output, home output and programs by drive operation of teaching unit.
- Control by serial communication
  - The PMC-1HS/2HS Series provides serial communication commands.
  - The PMC-1HS/2HS is connected to a PC or a sequence controller via an USB cable or RS-232C communication cable and it can control axes by means of user's independent program.

### ■ Ordering Information



# PMC-1HS/PMC-2HS Series

## ■ Specifications

Model	PMC-1HS-232	PMC-1HS-USB	PMC-2HS-232	PMC-2HS-USB
Control axes	1-axis		2-axis (Each axis can be independently programmed)	
Motor for control	Pulse train input stepper motor or servo motor			
Power supply	24VDC $\pm$ 10%			
Power consumption	Max. 6W			
Operation mode	Jog / Continuous / Index / Program mode			
In-Position setting	ABSOLUTE / INCREMENTAL method			
Number of index steps	64 indexes per axis			
In-Position range	-8,388,608 to +8,388,607 (supports pulse scaling function)			
Number of drive speed	4			
Drive Speed	1pps to 4Mpps (1 to 8,000 $\times$ magnification 1 to 500)			
Pulse output method	2-pulse output method (line driver output)			
Home search mode	High speed near home search (Step 1) $\rightarrow$ Low speed near home search (Step 2) $\rightarrow$ Encoder Z-phase search (Step 3) $\rightarrow$ Offset movement (Step 4). Configuring the detection direction and Enable/Disable in each step.			
Program function	Save	EEPROM		
	Steps	64-step		
	Control command	ABS, INC, HOM, IJP, OUT, OTP, JMP, REP, RPE, END, TIM, NOP (12 types)		
	Start	Available power ON program auto start setting		
	Home search	Available power ON home search setting		
General output	1-point		2-point	
Control interface	Parallel I/F			
Environment	Ambient temp.	0 to 45°C		
	Ambient humidity	35 to 85%RH		
Accessory	Common	User manual, CD		
	Power connector	[CN1] MC1, 5/2-ST-3.5 (PHOENIX): 1		
	RS-232C connector	[CN2] RS-232C communication cable (1.5m): 1		
	P I/F connector	[CN3] 20P MIL standard, 2.54mm connector: 1		
	X-axis I/O connector	[CN4] 16P MIL standard, 2.54mm connector: 1 (In case of 2HS, using 2)		
	Y-axis I/O connector	—	[CN5] 16P MIL standard, 2.54mm connector: 1	
	USB connector	—	USB communication cable (1m): 1	—
Approval	CE			
Weight $\times$ 1	Approx. 386g (approx. 96.8g)	Approx. 421.6g (approx. 96.9g)	Approx. 393.6g (approx. 100.2g)	Approx. 432.2g (approx. 100.4g)

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

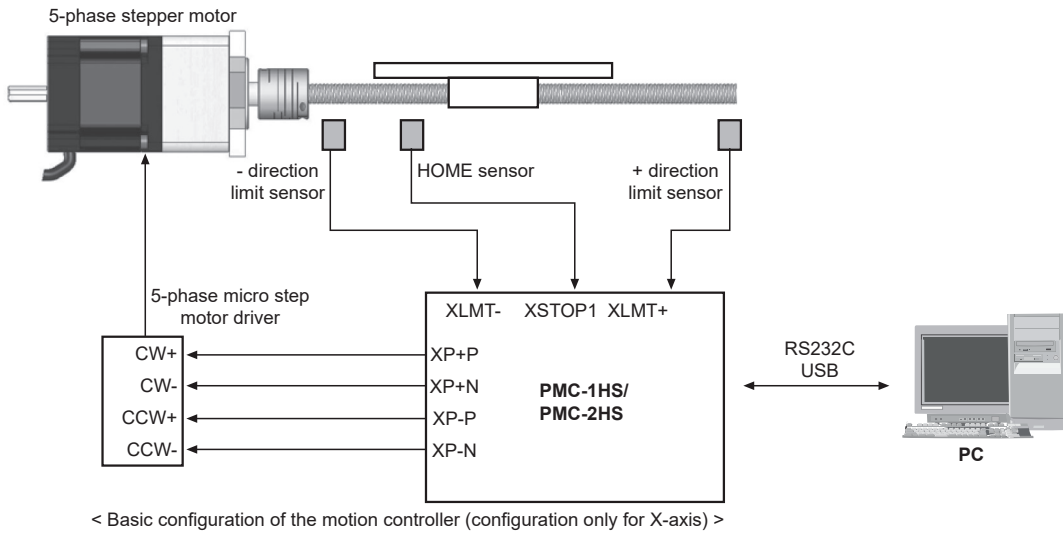
※Environment resistance is rated at no freezing of condensation.

## ■ Program Commands

Command type	Code	Description
Drive commands	ABS	Move absolute position
	INC	Move relative position
	HOM	Home search
I/O commands	IJP	Jump input condition
	OUT	ON/OFF of output port
	OTP	ON pulse from output port (certain time)
Program control commands	JMP	Jump
	REP	Start repetition
	RPE	End repetition
	END	End program
Others	TIM	Timer
	NOP	No operation

# 1-2-Axis High Speed Programmable Motion Controller

## Connections



SENSORS
CONTROLLERS
<b>MOTION DEVICES</b>
SOFTWARE

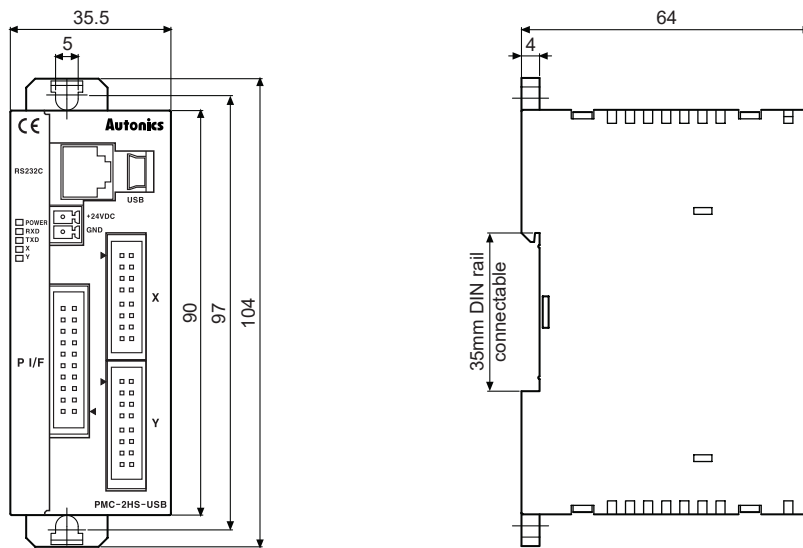
(Y) Closed Loop Stepper System

(Z) Stepper Motors

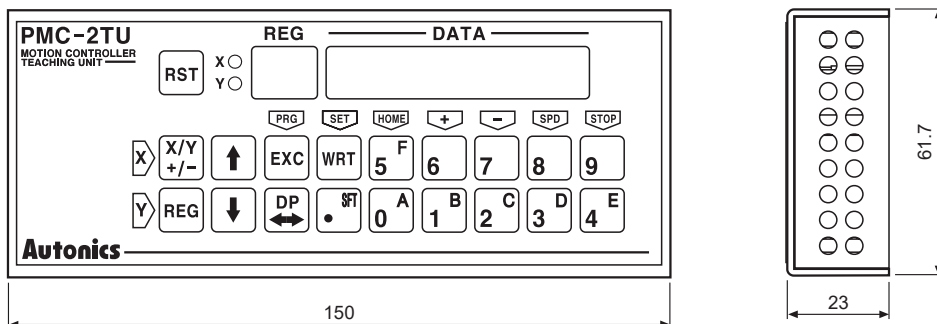
(AA) Drivers

(AB) Motion Controllers

## Dimensions

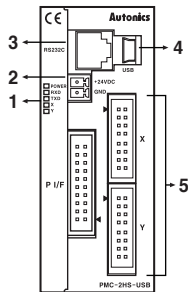


## Sold separately (teaching unit, PMC-2TU-232)



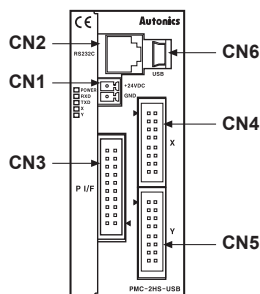
# PMC-1HS/PMC-2HS Series

## Unit Descriptions



- 1. Power / Status indicator**  
Used to indicate power, communication status of the controller, and operation status of each axis.
- 2. Power connector terminal**  
Used to connect power for controller
- 3. RS232C connector terminal**  
Used to connect RS232 serial (RJ12-DSUB9) connection cable
- 4. USB/RS485 connector terminal**  
Used to connect USB and RS485 connection cable
- 5. External I/O connector terminal**  
Used to operate various drives through input and output of Parallel I/F, X, Y

## External I/O Terminal Connection



Connector No.	Description
CN1	Power connector
CN2	RS232C connector (connect with PMC-2TU-232)
CN3	Parallel I/F connector
CN4	X-axis I/O connector
CN5	Y-axis I/O connector
CN6	USB connector

※PMC-1HS-232 does not have CN5 and CN6,  
PMC-1HS-USB does not have CN5, and  
PMC-2HS-232 does not have CN6.

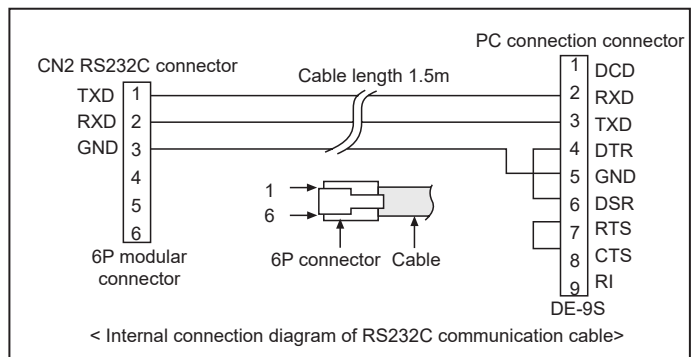
## CN1: Power Connector

Pin No.	Signal name
1	24VDC
2	GND (0V)

## CN2: RS232C Connector

Pin No.	Signal name	Input/Output	Description
1	TXD	Output	Transmitting data
2	RXD	Input	Receiving data
3	GND	—	Ground
4	—	—	N-C
5	—	—	
6	—	—	

※The internal connection diagram of RS232C communication cable is as shown below.



# 1-2-Axis High Speed Programmable Motion Controller

## ■ CN3: Parallel I/F Connector

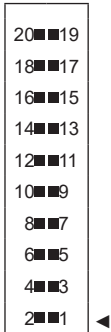
Motion controller is controlled via Parallel I/F connected with a sequencer or mechanical junction as the dedicated program.

'The input signal is in the ON state' means that the input signal and GEX terminal is connected via a mechanical junction or an open collector.

'The output is in the ON state' means that an open collector output transistor becomes high.

Pin No.	Signal name	Input/Output	Description
1	RESET	Input	Reset
2	HOME	Input	Home search start
3	STROBE	Input	Drive start
4	X/JOG Y+	Input	X-axis setting/Jog 2 mode Y+
5	Y/JOG Y-	Input	Y-axis setting/Jog 2 mode Y-
6	REGSL0/RUN+/JOG X+	Input	Register setting 0/Run+/Jog 2 mode X+
7	REGSL1/RUN-/JOG X-	Input	Register setting 1/Run-/Jog 2 mode X-
8	REGSL2/SPD0	Input	Register setting 2/Drive speed setting 0
9	REGSL3/SPD1	Input	Register setting 3/Drive speed setting 1
10	REGSL4/JOG	Input	Register setting 4/Jog setting
11	REGSL5/STOP	Input	Register setting 5/Drive stop
12	MODE0	Input	Operation mode setting 0
13	MODE1	Input	Operation mode setting 1
14	X DRIVE/END	Output	X-axis drive/Drive end pulse
15	Y DRIVE/END	Output	Y-axis drive/Drive end pulse
16	X ERROR	Output	X-axis error
17	Y ERROR	Output	Y-axis error
18	GEX	0V	GND
19	GEX	0V	GND
20	VEX	+24V	Power output for sensor (less than 24VDC, 100mA)

<CN3 pin number>

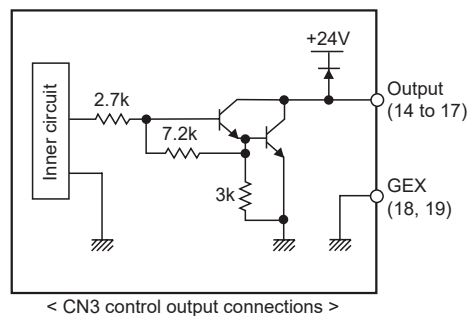
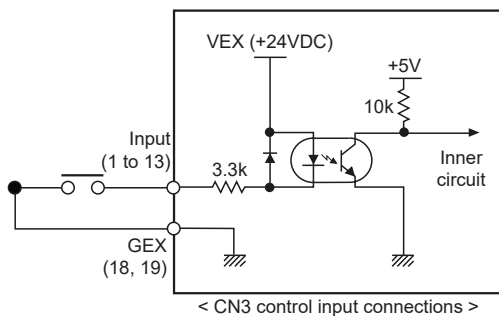


[Hiros connector]: HIF3BA-20PA-2.54DS

[Connector socket specification]: Contact the manufacture for the socket and cable.

	Specifications	Manufacture
Connector socket	H F3BA-20D-2 54R	Hiros Electric
/O cable (sold separately)	CO20-HP□-L, CO20-HP□-R	Autonics

## ■ Input/Output Connections of CN3



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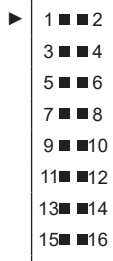
## ■ CN4, CN5: X, Y-Axis Input/Output Connector

CN4 and CN5 are the I/O signal connector for X-axis and Y-axis respectively.  
The pin arrangement of CN4 and CN5 are equal. PMC-1HS does not have CN5.  
'n' in the below table means X for CN4 and Y for CN5.

Pin No.	Signal name	Input/Output	Description
1	nP+P	Output	CW +direction drive pulse
2	nP+N	Output	CW -direction drive pulse
3	nP-P	Output	CCW +direction drive pulse
4	nP-N	Output	CCW -direction drive pulse
5	n OUT0	Output	General output 0/DCC
6	n INPOS	Input	Servo In-Position complete
7	n ALARM	Input	Servo alarm
8	GEX	0V	GND
9	n STOP2	Input	Encoder Z-phase
10	n STOP1	Input	Home
11	n STOP0	Input	Near Home
12	n LMT+	Input	LMT+
13	n LMT-	Input	LMT-
14	EMG	Input	Emergency stop
15	GEX	0V	GND
16	VEX	+24V	Power output for sensor (less than 24VDC, 100mA)

※CN4, 5 input/output circuit except drive pulse is same as CN3 input/output circuit.  
Drive pulse output of motion controller which input by motor driver is line driver output.

<CN4, CN5 pin number>

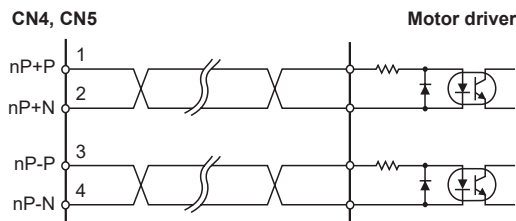


[Hirose connector]: HIF3BA-16PA-2 54DS

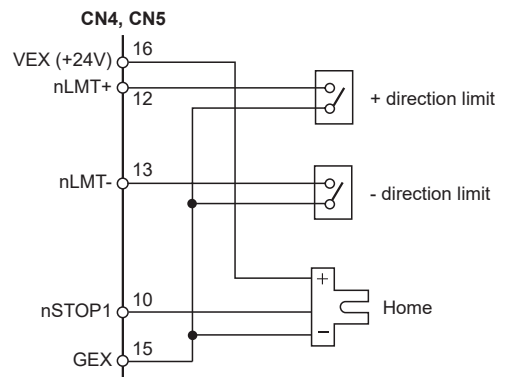
[Connector socket specification]: Contact the manufacturer for the socket and cable.

	Specifications	Manufacture
Connector socket	HIF3BA-16D-2.54R	Hirose Electric

### E.g. Connection with a motor driver



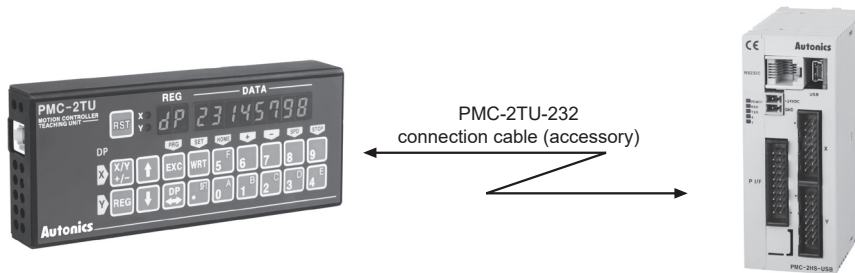
### E.g. Connect of Limit and Home signal



# 1-2-Axis High Speed Programmable Motion Controller

## ■ Teaching Unit PMC-2TU-232 (sold separately)

The teaching unit (PMC-2TU-232) is a device that builds the operation mode parameter and operation program for the main body without a PC. In addition, it can carry out the start of the operation program, the home search and Jog operation. The teaching unit is used by connection the private cable (1.5m) to the RS-232C connector (CN2) of the main body.



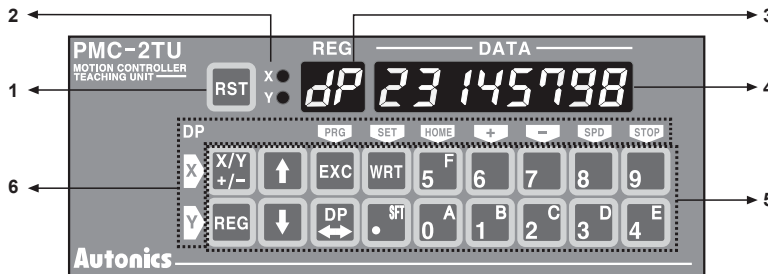
Teaching unit consists of data edit mode and drive operation mode.

The data edit mode displays a register number to the REG of the display part, and the drive handling mode displays dp (drive operation). When turned on, it starts as the drive handling mode (dp display).

The [DP] button is used to convert the status of the data edit mode and the drive operation mode.

Mode	Operation	REG display
Data edit	<ul style="list-style-type: none"> <li>• Adding operation mode parameter and operation program</li> <li>• Index drive operation</li> </ul>	Register number
Drive handling	<ul style="list-style-type: none"> <li>• Displaying the current position</li> <li>• Jog operation</li> <li>• Home search</li> <li>• Program execution</li> </ul>	dp (drive operation)

The front panel of the teaching unit is as shown below;



- 1. Reset:** Reset the controller and teaching unit.
- 2. X/Y display:** Display the currently selected axis.
- 3. Register number display/dp**  
: Displays the currently selected register number when data is editing and dp when operating drive.
- 4. Data display**  
: Displays the data of each register when data is editing and the current position of the selected axis when operating drive.
- 5. Input button**
  - X/Y: Converts the selecting axis. It is used to convert the sign of an input value when the value is entered and a mode data that the mode data is entered.
  - REG: It is used to input the register number to display.  
If this button is pressed on the data input, the data input is canceled and returns to the state before the data input.
  - ↑/↓: Increases / decreases the displayed register number.
  - EXC: Runs the displayed command. However, this command is only valid for ABS, INC, OUT, OTP and HOM 1 to 4 commands.
  - DP: Converts the drive handling status and the data edit status.
  - WRT: Adds a value when data is editing.
- 6. Button display for drive operation**  
: Displays button function as yellow letters to the left or the top of the input button in drive handling status.  
The top end and the bottom end of the button handle X-axis and Y-axis respectively.

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