Autonics PMC-1HS High Speed Programmable Motion Controller Instruction Manual

Contents

Autonics

PMC-1HS High Speed Programmable Motion Controller

Product Information

The Transparent Guide is a motion controller that comes in two variants – 1 axis and 2 axis. It is available in two series – PMC-1HS and PMC-2HS. The product is certified by KCC for commercial use. It is designed to be used with machinery that may cause serious injury or substantial economic loss such as medical equipment, nuclear power control, ships, vehicles, railways, aircraft, combustion apparatus, safety equipment, crime / disaster prevention devices, etc.

Safety Considerations

The following safety instructions must be followed to avoid personal injury, economic loss, or product damage:

- A fail-safe device must be installed when using the unit with machinery that may cause serious injury or substantial economic loss.
- Do not use the unit in the place where flammable / explosive / corrosive gas, high humidity, direct sunlight, radiant heat, vibration, impact or salinity may be present.
- Install on a device panel or DIN rail to use.
- Do not connect, repair, or inspect the unit while connected to a power source.
- Check ‘Connections’ before wiring.
- Do not disassemble or modify the unit.
- Do not cut off power or disconnect connectors while operating the unit.
- Install the safety device at the out of the controller for stable system operation against external power error,

controller malfunction, etc.

Cautions

The following cautionary instructions must be followed to avoid personal injury or product damage:

- When connecting the power input, use AWG 28 – 16 (0.081 to 1.31mm2) cable or over.
- Must use the insulated trans at the power input.
- Use the unit within the rated specifications.
- Use a dry cloth to clean the unit, and do not use water or organic solvent.
- Keep the product away from metal chip, dust, and wire residue which flow into the unit.
- If a ribbon cable is used as the I/O line, connect the cable correctly and prevent from poor contact.

Ordering Information

The product is available in two variants – 1HS: 1 axis high speed stand alone and 2HS: 2 axis high speed stand alone. It supports two communication types – RS232C and USB / RS232C.

Product Usage Instructions

1. Install the Transparent Guide on a device panel or DIN rail.
2. Connect the power input using AWG 28 – 16 (0.081 to 1.31mm2) cable or over. Ensure that the insulated trans is used at the power input.
3. Check ‘Connections’ before wiring.
4. Use the unit within the rated specifications.
5. Clean the unit with a dry cloth, and avoid using water or organic solvent.
6. Keep the product away from metal chip, dust, and wire residue which flow into the unit.
7. If a ribbon cable is used as the I/O line, connect the cable correctly and prevent from poor contact.
8. Download the installation file and manuals for the software program ‘atMotion’ from the Autonics website.
9. Use the program to manage the motor driver’s parameter setting and monitoring data.
10. Follow the Autonics website to select the specified model for ordering.

1 axis / 2 axis Motion Controller

PMC-1HS / PMC-2HS Series

Thank you for choosing our Autonics product. Read and understand the instruction manual and manual thoroughly before using the product. For your safety, read and follow the below safety considerations before using. For your safety, read and follow the considerations written in the instruction manual, other manuals and Autonics website. Keep this instruction manual in a place where you can find easily. The specifications, dimensions, etc. are subject to change without notice for product improvement. Some models may be discontinued without notice. Follow Autonics website for the latest information.

Safety Considerations

- Observe all ‘Safety Considerations’ for safe and proper operation to avoid hazards.

- ⚠ symbol indicates caution due to special circumstances in which hazards may occur.

Warning: Failure to follow instructions may result in serious injury or death.

1. Fail-safe device must be installed when using the unit with machinery that may cause serious injury or substantial economic loss. (e.g. nuclear power control, medical equipment, ships, vehicles, railways, aircraft, combustion apparatus, safety equipment, crime / disaster prevention devices, etc.)
   Failure to follow this instruction may result in personal injury, economic loss or fire.
2. Do not use the unit in the place where flammable / explosive / corrosive gas, high humidity, direct sunlight, radiant heat, vibration, impact or salinity may be present.
   Failure to follow this instruction may result in explosion or fire.
3. Install on a device panel or DIN rail to use.
   Failure to follow this instruction may result in fire.
4. Do not connect, repair, or inspect the unit while connected to a power source.
   Failure to follow this instruction may result in fire.
5. Check ‘Connections’ before wiring.
   Failure to follow this instruction may result in fire.
6. Do not disassemble or modify the unit.
   Failure to follow this instruction may result in fire.
7. Do not cut off power or disconnect connectors while operating the unit.
   Failure to follow this instruction may result in personal injury or economic loss.
8. Install the safety device at the out of the controller for stable system operation against external power error, controller malfunction, etc.
   Failure to follow this instruction may result in personal injury or economic loss.

Caution:

Failure to follow instructions may result in injury or product damage.

1. **When connecting the power input, use AWG 28 – 16 (0.081 to 1.31mm2) cable or over.**
2. Must use the insulated trans at the power input.
   Failure to follow this instruction may result in personal injury or fire.
3. Use the unit within the rated specifications.
   Failure to follow this instruction may result in fire or product damage.
4. Use a dry cloth to clean the unit, and do not use water or organic solvent.
   Failure to follow this instruction may result in fire.
5. Keep the product away from metal chip, dust, and wire residue which flow into the unit.
   Failure to follow this instruction may result in fire or product damage.
6. If a ribbon cable is used as the I/O line, connect the cable correctly and prevent from poor contact.
   Failure to follow this instruction may result in malfunction.
7. Note that this device is KCC certified for commercial use.
   Make proper applications for the product.

Cautions during Use

- Follow instructions in ‘Cautions during Use’. Otherwise, it may cause unexpected accidents.
- Power supply should be insulated and limited voltage/current or Class2, SELV power supply device.
- Install a power switch or circuit breaker in the easily accessible place for supplying or disconnecting the power.
- Wire as short as possible and keep away from high voltage lines or power lines, to prevent inductive noise.
- Run the unit after setting parameter with proper value depending on the load and environment.
- Make sure that Power On function is set to ON in atMotion program before supplying the power to the unit.
- Keep the distance between power cable and signal cable over 10 cm.
- It is recommended to use twisted pair shield wire when connecting cables to CN3, 4, 5 connectors. Ground the shield wires depending on the installation environment.
- It is recommended to use the communication cables provided with the product. (RS232C, USB)
- When wiring the RS485 cable, twist pair wire is recommended, and use AWG 24 (0.2mm2) cable or over.
- This unit may be used in the following environments.
    - Indoors (in the environment condition rated in ‘Specifications’)
    - Altitude max. 2,000 m
    - Pollution degree 2
    - Installation category II

Software

Download the installation file and the manuals from the Autonics website.

atMotion:
The program allows to manage the motor driver’s parameter setting and monitoring data.

Ordering Information

This is only for reference, the actual product does not support all combinations.. For selecting the specified model, follow the Autonics website.

PMC – ❶ – ❷

- **Axis / Type**
  1HS: 1 axis high speed stand alone 2HS: 2 axis high speed stand alone
- **Communication type 232: RS232C**
  USB: USB / RS232C

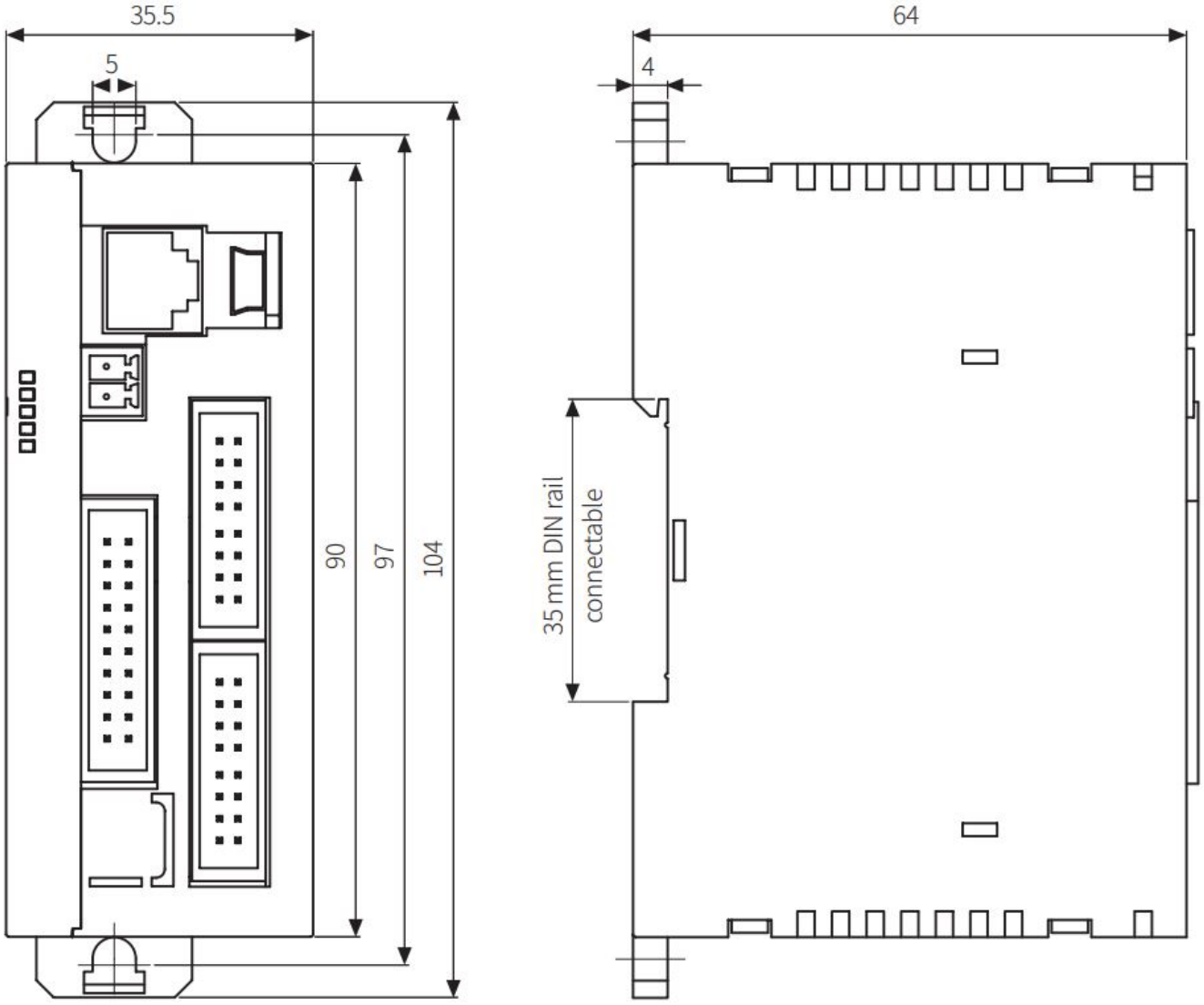
Product Components

- Product
- User manual
- CD
- D-Sub cable
- Power connector
- I/O connector (P I/F, X axis, Y axis)

- RS232C comm. cable 1.5 m
- USB comm. cable 1 m (PMC-▭-USB Series)

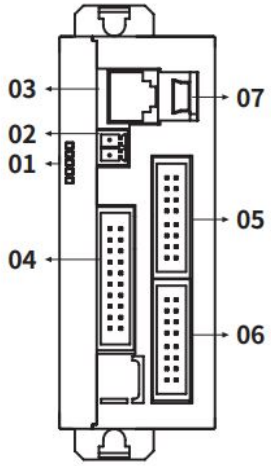
Dimensions

Unit: mm, For the detailed drawings, follow the Autonics website.



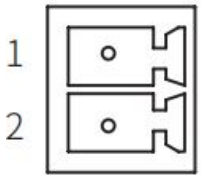
Unit Descriptions

- Power / Status indicator
- Power connector (CN1)
- RS232C comm. connector (CN2)
- Parallel I/F connector (CN3)
- X axis I/O connector (CN4)
- Y axis I/O connector (CN5) 01)
- USB comm. connector (CN6) 02)
    - The corresponding connector is only available on PMC-2HS-▭.
    - The corresponding connector is only available on PMC-▭-USB.



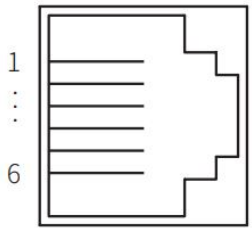
Connectors

CN1: Power connector



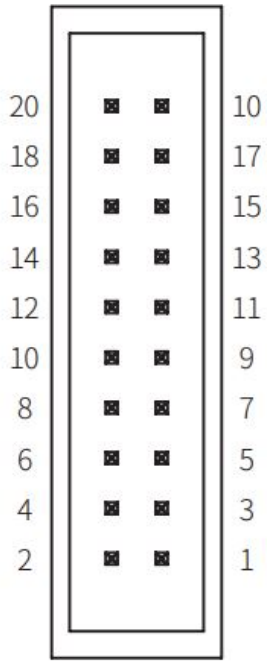
Pin	Function
1	24 VDC⎓
2	GND

CN2: RS232C connector



Pin	Function
1	TXD
2	RXD
3	GND
4	N·C
5	
6	

CN3: Parallel I/F connector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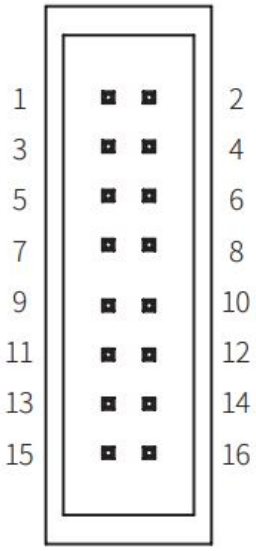
Pin	Function	I/O	Description
1	RESET	Input	Reset
2	HOME	Input	Home search start
3	STROBE	Input	Drive start
4	X/JOG Y+	Input	X axis designate / Jog Y+
5	Y/JOG Y-	Input	Y axis designate / Jog Y-
6	REGSL0/RUN+/JOG X+	Input	Register setting 0 / Run+ / Jog X+
7	REGSL1/RUN-/JOG X-	Input	Register setting 1 /Run- / JogX-
8	REGSL2/SPD0	Input	Register setting 2 / Drive speed designate 0
9	REGSL3/SPD1	Input	Register setting 3 / Drive speed designate 1
10	REGSL4/JOG	Input	Register setting 4 / Jog designate
11	REGSL5/STOP	Input	Register setting 5 / Drive stop
12	MODE0	Input	Operation mode designate 0
13	MODE1	Input	Operation mode designate 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	–	GND
19	GEX	–	GND
20	VEX	–	Sensor power output (24 VDC , max. 100 mA)

CN4, 5: X, Y axis I/O connector



Pin	Function	I/O	Description
1	nP+P	Output	CW+ drive pulse
2	nP+N	Output	CW- drive pulse
3	nP-P	Output	CCW+ drive pulse
4	nP-N	Output	CCW- 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	–	GND
9	n STOP2	Input	Encoder Z phase
10	n STOP1	Input	Home
11	n STOP0	Input	Near Home
12	n LMT+	Input	+ direction limit
13	n LMT-	Input	– direction limit
14	EMG	Input	Emergency stop
15	GEX	–	GND
16	VEX	–	Sensor power output (24 VDC , max. 100 mA)

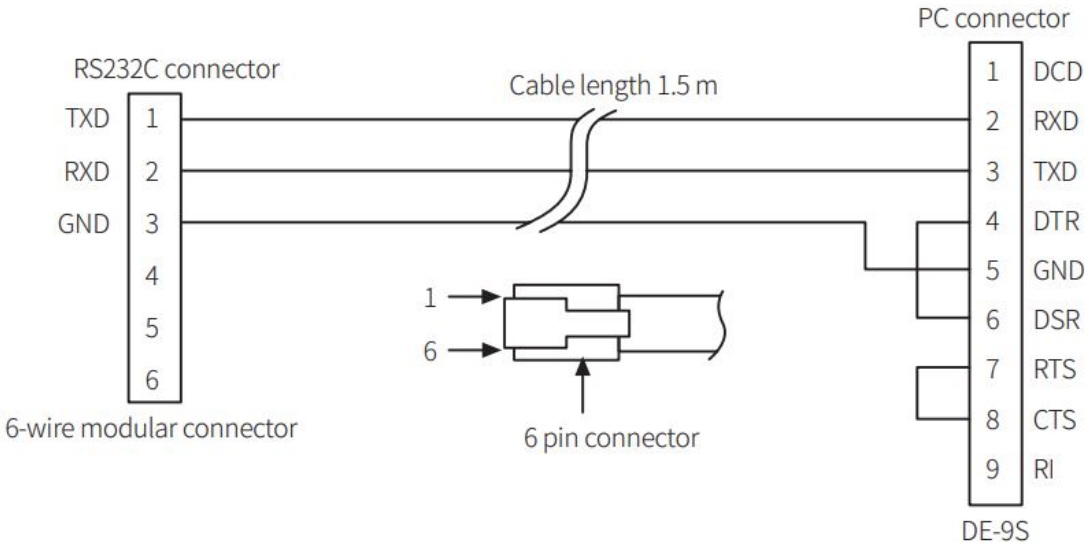
Connector specifications

Contact the manufacture for the socket and cable.

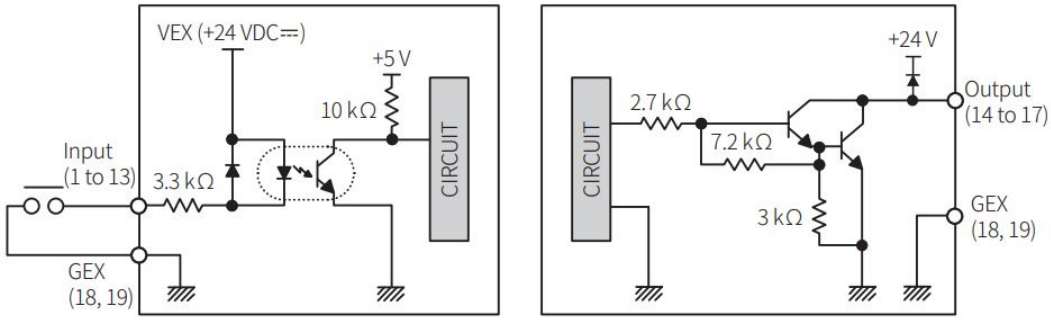
Connector		Specifications	Manufacture
CN3	Parallel I/F connector socket	HIF3BA-20D-2.54R	Hirose Electric
CN3	I/O cable (sold separately)	CO20-HP□-L, CO20-HP□-R	Autonics
CN4, 5	X, Y axis I/O connector socket	HIF3BA-16D-2.54R	Hirose Electric

Connection Diagram

RS232C communication cable

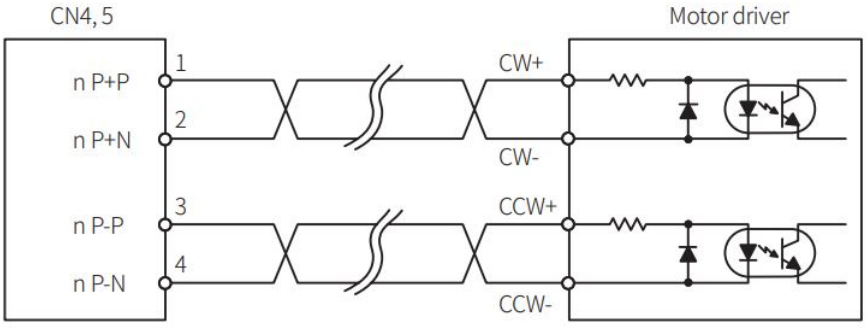


Parallel I/F

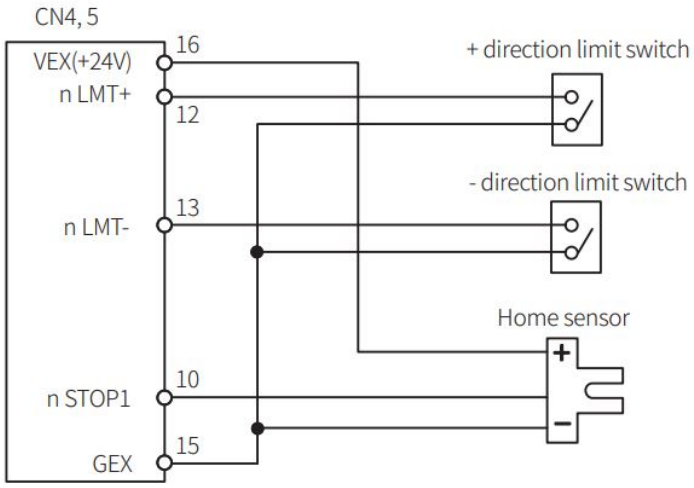


Input control circuit **Output control circuit**

Motor driver CN4, 5



Limit switch and home sensor CN4, 5



Specifications

Model	PMC-1HS-232	PMC-1HS-USB	PMC-2HS-232	PMC-2HS-USB
Power supply	24 VDC ± 10%			
Power consumption	≤ 6 W			
Control axes	1 axis		2 axis (each axis can be programmed independently)	
Motor control	Pulse input stepper motor or servo motor			
In-Position setting	ABSOLUTE method / INCREMENTAL method			
In-Position range	-8,388,608 to +8,388,607 (available pulse scaling function)			
Drive speed	1 pps to 4 Mpps (1 to 8000×magnification 1 to 500)			
Pulse output method	2 pulse output method (line driver output)			
Operation mode	Jog mode, Continuous mode, Index mode, Program mode			
No. of drive speed	4			
Program save	EEPROM			
Index steps	64 step per each axis			
Steps	64 Step			
Control command	ABS, INC, HOM, IJP, OUT, OTP, JMP, REP, RPE, END, TIM, NOP			
Program function	Power On Program Start, Power On Home Search			
Home search mode	High speed near home search (STEP1) → Low speed near home search (STEP2) → Encoder Z phase search (STEP3) → Offset movement (STEP4) Configuring the detection direction and Enable/Disable in each step			
General output	1 point		2 point	
Control interface	Parallel I/F			
Ambient temp.	0 to 45°C (no freezing or condensation)			
Ambient humi.	35 to 85%RH (no freezing or condensation)			
Approval	CE EAC			
Unit weight (packaged)	≈ 96.8 g (≈ 386 g)	≈ 96.9 g (≈ 421.6 g)	≈ 100.2 g (≈ 393.6 g)	≈ 100.4 g (≈ 432.2 g)

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Documents / Resources

	**Autonics PMC-1HS High Speed Programmable Motion Controller** [pdf] Instruction Manual PMC-1HS High Speed Programmable Motion Controller, PMC-1HS, High Speed Programmable Motion Controller, Speed Programmable Motion Controller, Programmable Motion Controller, Motion Controller, Controller

References

- autonics.com