

## 1 axis / 2 axis Motion Controller

# PMC-1HS / PMC-2HS Series

## INSTRUCTION MANUAL

TCD210134AA

**Autonics**

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.

**01. 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.

**02. 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.

**03. Install on a device panel or DIN rail to use.**  
Failure to follow this instruction may result in fire.

**04. Do not connect, repair, or inspect the unit while connected to a power source.**  
Failure to follow this instruction may result in fire.

**05. Check 'Connections' before wiring.**  
Failure to follow this instruction may result in fire.

**06. Do not disassemble or modify the unit.**  
Failure to follow this instruction may result in fire.

**07. 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.

**08. 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.

**09. 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.

**10. Install on a device panel or DIN rail to use.**  
Failure to follow this instruction may result in fire.

**11. Do not connect, repair, or inspect the unit while connected to a power source.**  
Failure to follow this instruction may result in fire.

**12. 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.

**13. 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.

**14. 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.

**15. Install on a device panel or DIN rail to use.**  
Failure to follow this instruction may result in fire.

**16. Do not connect, repair, or inspect the unit while connected to a power source.**  
Failure to follow this instruction may result in fire.

**17. 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.

**18. Install the safety device at the out of the controller for stable system operation against external power error, controller malfunction, etc.**  
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**19. 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.

**20. Install on a device panel or DIN rail to use.**  
Failure to follow this instruction may result in fire.

**21. Do not connect, repair, or inspect the unit while connected to a power source.**  
Failure to follow this instruction may result in fire.

**22. 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.

**23. 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.

**24. 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.

**25. 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.

**26. 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.

**27. 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.

**28. Install on a device panel or DIN rail to use.**  
Failure to follow this instruction may result in fire.

**29. Do not connect, repair, or inspect the unit while connected to a power source.**  
Failure to follow this instruction may result in fire.

**30. 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.

**31. 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.

**32. 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.

**33. Install on a device panel or DIN rail to use.**  
Failure to follow this instruction may result in fire.

**34. Do not connect, repair, or inspect the unit while connected to a power source.**  
Failure to follow this instruction may result in fire.

**35. 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.

**36. 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.

**37. 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.**  
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**39. Do not connect, repair, or inspect the unit while connected to a power source.**  
Failure to follow this instruction may result in fire.

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Failure to follow this instruction may result in explosion or fire.

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Failure to follow this instruction may result in fire.

**49. Do not connect, repair, or inspect the unit while connected to a power source.**  
Failure to follow this instruction may result in fire.

**50. 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.

**51. 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.

- 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 (0.2mm<sup>2</sup>) 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 | - | ① | - | ② |
|-----|---|---|---|---|

#### ① Axis / Type

1HS: 1 axis high speed stand alone  
2HS: 2 axis high speed stand alone

#### ② Communication type

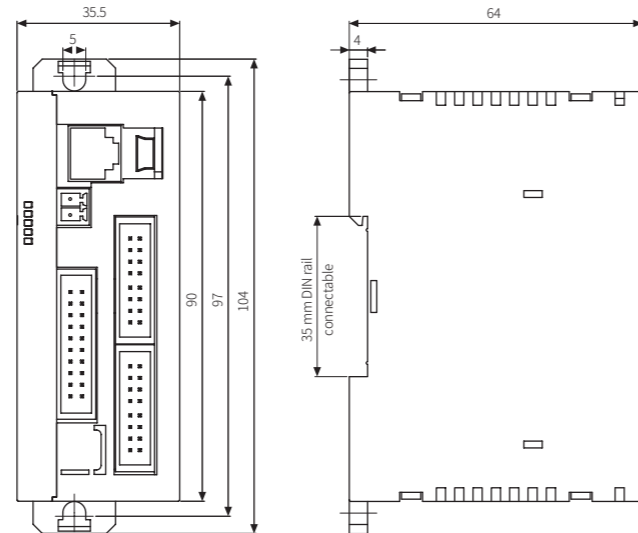
232: RS232C  
USB: USB / RS232C

### 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)<sup>01)</sup>
- USB comm. connector (CN6)<sup>02)</sup>

01) The corresponding connector is only available on PMC-2HS-□□.  
02) 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   |          |
| 5   | N · C    |
| 6   |          |

#### ■ CN3: Parallel I/F connector

| 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- / Jog X-           |
| 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   | n P+P    | Output | CW+ drive pulse                            |
| 2   | n P+N    | Output | CW- drive pulse                            |
| 3   | n P-P    | Output | CCW+ drive pulse                           |
| 4   | n P-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) |

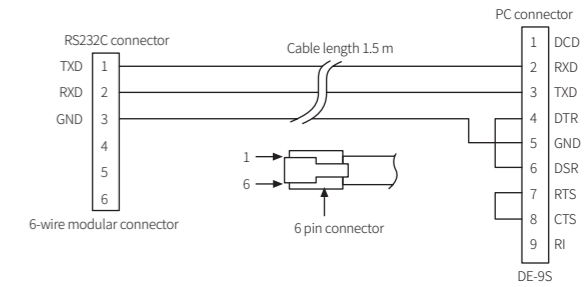
#### ■ Connector specifications

Contact the manufacture for the socket and cable.

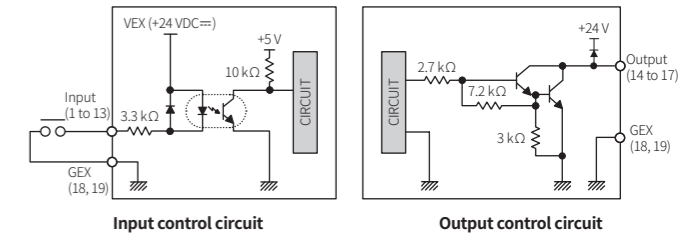
| Connector | Specifications                 | Manufacture            |
|-----------|--------------------------------|------------------------|
| CN3       | Parallel I/F connector socket  | HIF3BA-20D-2.54R       |
| CN3       | I/O cable (sold separately)    | CO20-HP□-L, CO20-HP□-R |
| CN4, 5    |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

### Connection Diagram

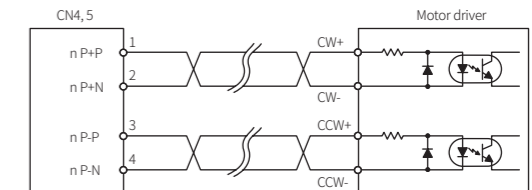
#### ■ RS232C communication cable



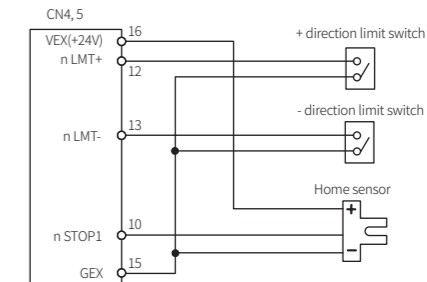
#### ■ Parallel I/F



#### ■ Motor driver



#### ■ Limit switch and home sensor



### 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 ENEC   |                      |  |                       |
| 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) |