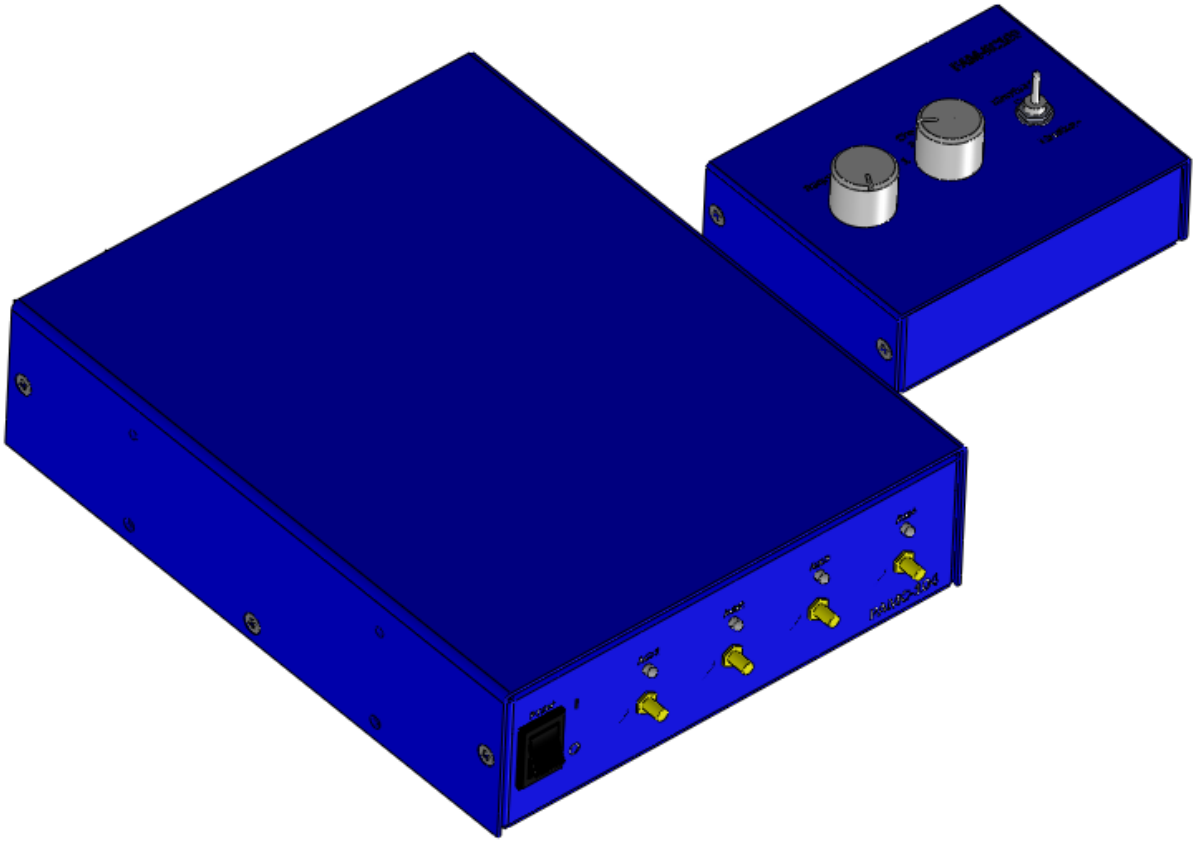
Piezo Assist Motor Controller
PAMC-104 Operation Manual



Mechano Transformer Corporation

Revision History

Version number	Date	Revised content	Approved by
1	20230105	English First Edition Ver0.1	Chee Sze Keat
2	20241001	Software 0.4.5ver update	Chee Sze Keat
3	20250711	CE Declaration and ROHS Conformity	Chee Sze Keat
4	20251001	Software Acquisition Method Update	Chee Sze Keat

EU Declaration of Conformity (DoC)

We

Company name:	Mechano Transformer Corporation
Postal address:	4F BUILDX No.3, 2-7-12, Iwamoto-cho, Chiyoda-ku
Postcode:	101-0032
City:	Tokyo, Japan
Telephone number:	+81-3-5835-0108

declare that the DoC is issued under our sole responsibility and belongs to the following product:

Apparatus model/Product:	Piezo Assist Motor and Piezo Drive Motor
Number:	PAMwxyz (w=3-6.5 or 6-13, x=R or Null, y=-C, -C1 or Null, z=N, V or Null), PDM-6.5ACTu(u=Null, R or R-C1), PDM-13ACTv(v=Null, R, R-C1 or R-C2)
Category	Electrical equipment for measurement, control and laboratory use

The object of the declaration described above is in conformity with the relevant Union harmonisation legislation:

EMC Directive 2014/30/EU	RoHS Directive 2011/65/eu
Low Voltage Directive (LVD) 2014/35/EU	

The following harmonised standards and technical specifications have been applied:

Title, Date of standard/specification:

EMC EN61326-1:2021, Class A	EMC EN61326-1:2021, Industrial
RoHS EN IEC 63000：2018	LVD EN 61010-1:2010+A1:2019

Signed for and on behalf of:

Japan	2025-6-5
Place of issue	Date of issue

Chee Sze Keat
Chief Executive Officer
Mechano Transformer Corporation
4F BUILDX No.3, 2-7-12, Iwamoto-cho, Chiyoda-ku, Tokyo
101-0032 Japan

EU Declaration of Conformity (DoC)

We

Company name:	Mechano Transformer Corporation
Postal address:	4F BUILDX No.3, 2-7-12, Iwamoto-cho, Chiyoda-ku
Postcode:	101-0032
City:	Tokyo, Japan
Telephone number:	+81-3-5835-0108

declare that the DoC is issued under our sole responsibility and belongs to the following product:

Apparatus model/Product:	Piezo Assist Motor Controller
Number:	PAMxy(x=C- or -RC, y=104, 204 or 100)
Category	Electrical equipment for measurement, control and laboratory use

The object of the declaration described above is in conformity with the relevant Union harmonisation legislation:

EMC Directive 2014/30/EU

RoHS Directive 2011/65/eu

Low Voltage Directive (LVD) 2014/35/EU

The following harmonised standards and technical specifications have been applied:

Title, Date of standard/specification:

EMC EN61326-1:2021, Class A

EMC EN61326-1:2021, Industrial

RoHS EN IEC 63000：2018

LVD EN 61010-1:2010+A1:2019

Signed for and on behalf of:

Japan	2025-6-5	Chee Sze Keat Chief Executive Officer Mechano Transformer Corporation 4F BUILDX No.3, 2-7-12, Iwamoto-cho, Chiyoda-ku, Tokyo 101-0032 Japan
Place of issue	Date of issue	

Content

1 Outline

This driver is specifically designed for driving Piezo Assist Motor (PAM). By using RS232C protocol or tool like TeraTerm, the PAM can be driven. Ready-made software can be downloaded and used to send commands to PAMC-104 through RS232C.

2 Safety Precautions

The following terms and symbols are used in this documentation and appear on the Model PAMC-104 Controller/Driver where safety related issues occur.

Definitions and Symbols

E**lectric Shock**

The Electrical Shock Symbol shown in this manual and on the product is a warning sign for hazardous high voltage. Mishandling the equipment could lead to serious damage, injury, or even death. Please handle with caution and follow all safety guidelines.

Potential Burn Hazard

The Hot Surface Symbol shown in this manual and on the product warns of high temperatures. Touching the surface may cause burns or injury. Please handle with care and follow all safety precautions.

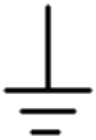
ON Switch Symbol

The symbol shown in the figure indicates the power switch position on the Model PAMC-104. It signifies that the device is in the Power On state.

OFF Switch Symbol

The symbol shown in the figure indicates the power switch position on the Model PAMC-104. It signifies that the device is in the Power Off state.

GROUND



The symbol above appears on the Model PAMC-104 to indicate the screw to be used to ground the case of the unit. This symbol identifies the frame or chassis terminal.

3 Composition

The driver consists of the following items.

PAMC-104 Set

① PAMC-104 driver ····· 1

② PAM-CA-USB-DSUB9-1(1m cable)····· 1

③ Instruction manual ····· 1

PAM-RC100 set（Sold separately）

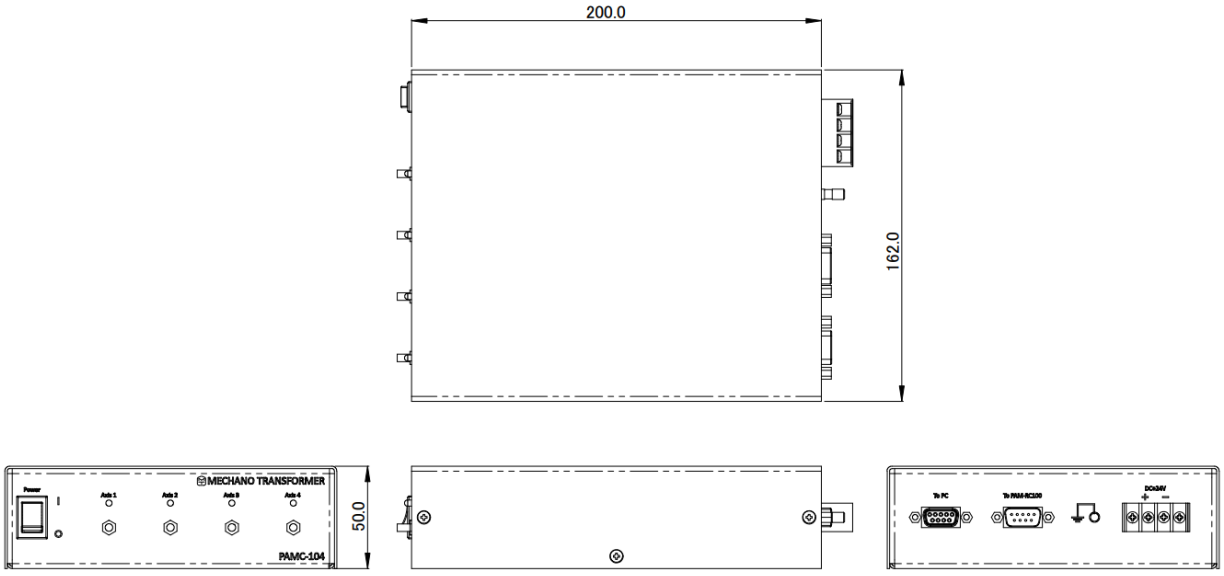
① PAM-RC100 ····· 1

② PAM-CA-DSUB9-DSUB9-2（2m cable）····· 1

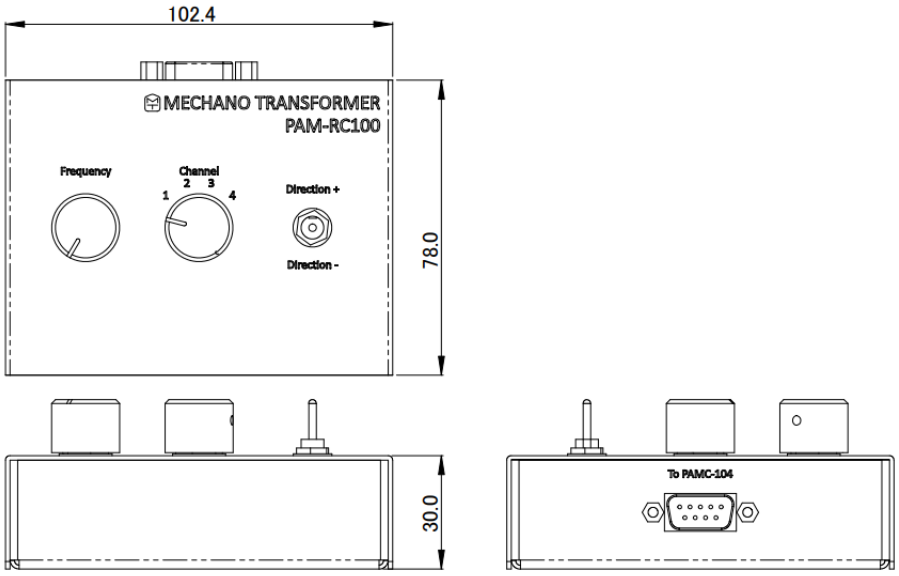
4 Dimensions and Specifications

4.1 Dimensions

PAMC-104 (excluding protrusion)



PAM-RC100 (excluding protrusion)



4.2 Specifications

・PAMC-104

1）General specifications

Supply Voltage	: DC 24 V
Current Consumption	: 0.5 A
Operating temperature	: 5～40 ℃
Storage temperature	: -20～60 ℃
Operating humidity	: 20~80%
Weight	: 0.6 Kg

2）Specifications

Number of channels	: 4 channel
Maximum Driving Frequency	: 1500Hz
Interface	: RS232C
Communication parameter：	
・Baud Rate	: 115200bps
・Data Bit	: 8bit
・Parity	: None
・Stop Bit	: 1bit
・Flow Control	: None
・Delimiter	: CR+LF

・PAM-RC100

1）General specifications

Operating temperature	: 5～40℃
Storage temperature	: -20～60℃
Operating humidity	: 20~80%
Weight	: 0.32 Kg

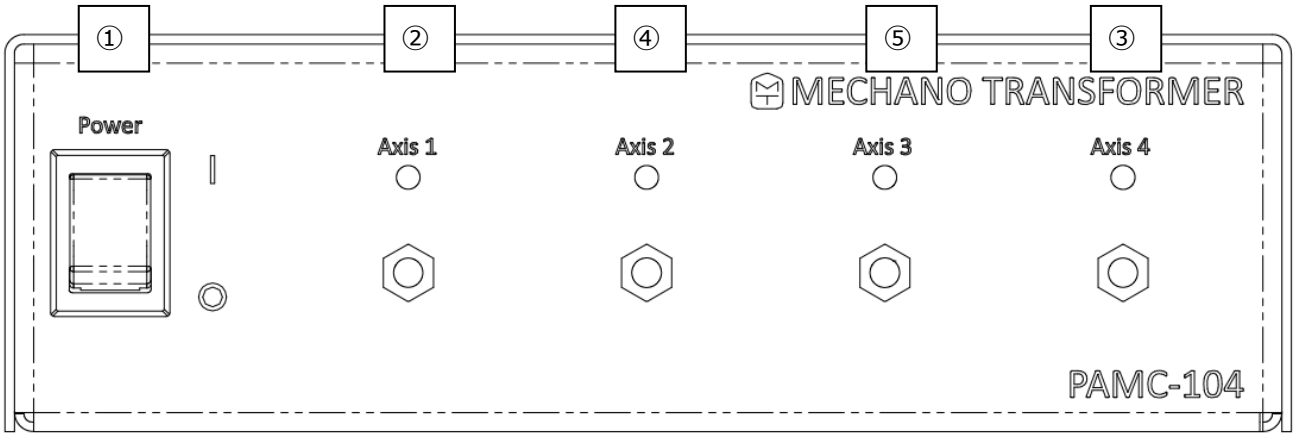
2）Specifications

Number of channels	: 4 channel
Maximum Driving Frequency	: 1500Hz

5 Operation Control

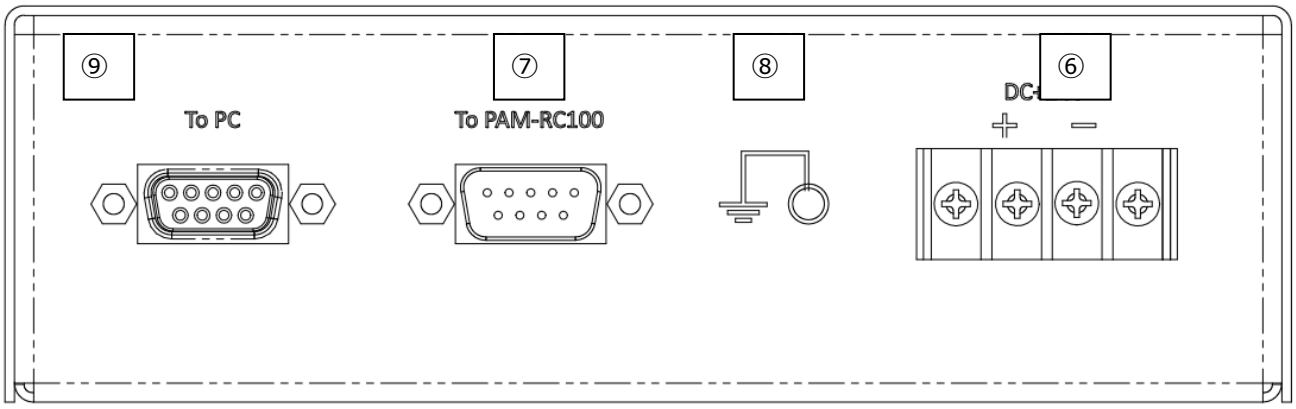
5.1 PAMC-104 Control

<Front Panel>



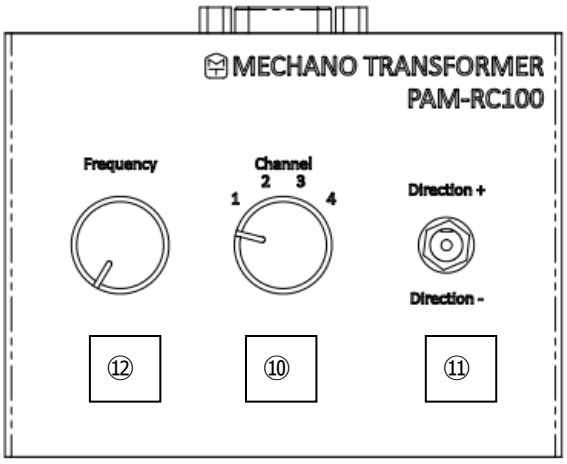
① [Power] : Power switch.
② [Axis1] : SMB connector for Ch1
③ [Axis2] : SMB connector for Ch2
④ [Axis3] : SMB connector for Ch3
⑤ [Axis4] : SMB connector for Ch4

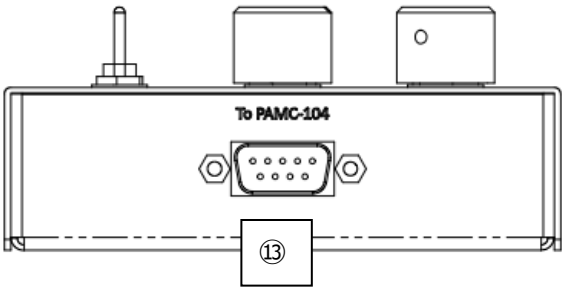
<Rear Panel>



⑥ [RS232 Connector] : RS232 terminal to connect to PC.
⑦ [RS232 Connector] : RS232 terminal to connect to PAM-RC100
⑧ [CASE GND] : Terminal for case ground.
⑨ [DC+24V] : DC Power supply terminal.

5.2 PAM-RC100 Control





⑩ [Channel] ：Channel selection (Ch1 ~ Ch4).

⑪ [Direction±] ：Control PAM movement direction.

⑫ [Frequency] ：Control driving frequency（Maximum 1500Hz）

⑬ [RS232 Terminal] ：RS232 Terminal to connect to PAMC-104

5.3 Connections and Settings

1）Connecting PAMC-104 to PAM

① Make sure the power switch is in OFF position.

② Connect PAM to the output terminals of PAMC-104 (Axis 1 ~ 4)

※Use the included cable only

2）Connecting PAMC-104 to PC

Communication between PAMC-104 and PC uses RS232 protocol.

Use 9 pin male straight DSUB to USB conversion cable.

① Make sure the power switch is in OFF position.

② Connect power supply to the DC24V terminal at the rear panel of PAMC-104

③ Connect the USB end of cable to PC and RS232 end of cable to PAMC-104 port.

To use serial communication, set the serial communication setting to the following parameters.

- Baud Rate : 115200bps
- Data Bit : 8bit
- Parity : None
- Stop bit : 1bit
- Flow Control : None
- Delimiter : CR+LF
- Flow Control : None

3）Powering the PAMC-104

Connect DC24V to the power terminal of PAMC-104. When switching on the power switch, confirm that the power switch LED is lighted up.

※Make sure to confirm the polarity of the power supply.

Precautions when using cables

- Only use the provided cables
- If the SMB cable cannot be inserted into the terminal securely, make sure that there is no foreign materials stuck in the terminal. The connector may be broken if inserted with excessive force.

6 PAMC-104 Operation

6.1 Control Piezo Assist Motor using PAM-RC100

Connection between PAM-RC100 and PAMC-104 uses DSUB cable.

Use 9 pin male to male straight DSUB cable.

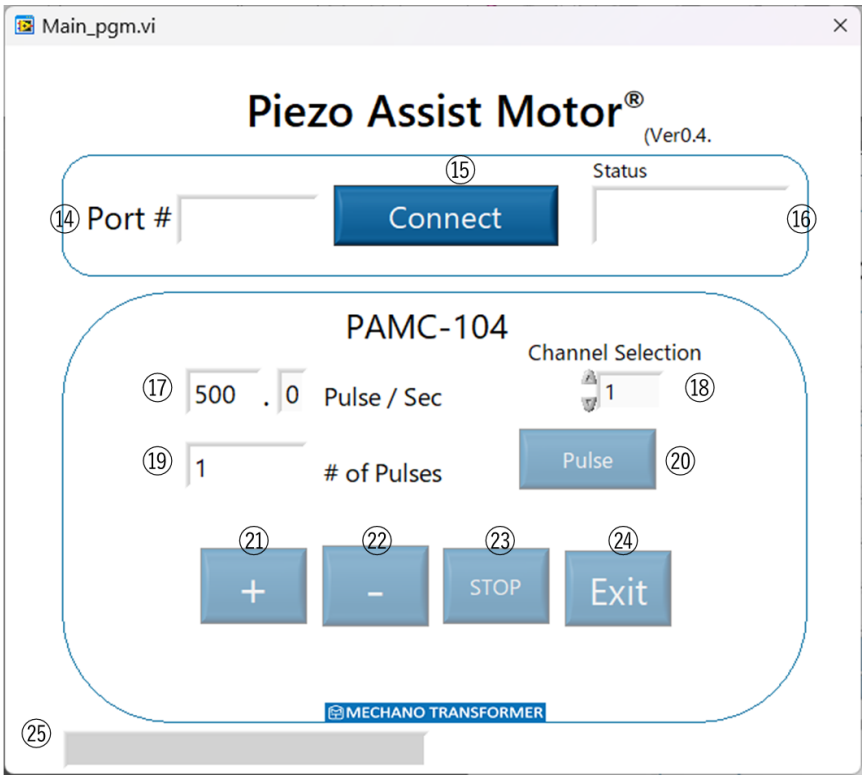
・Channel Knob ：Select channel to control connected PAM

・Direction ± Toggle Switch：Push toggle to [+] to move selected PAM into + direction.
Push toggle to [-] to move selected PAM into - direction.

・Frequency Knob ：Adjust the driving frequency of PAM to change movement speed.

6.2 Control Piezo Assist Motor using software

The software interface is as follows:



⑭ [Port#] : Display connected port.

⑮ [Connect] : Show「Port selection」window when clicked.

⑯ [Status] : Display status of connection to PAMC-104.
If connected properly, ”connected” will be displayed.
If connected improperly, ”exit” will be displayed.

⑰ [Pulse/Sec] : Set driving frequency. (Can set lowest driving frequency to 0.1Hz for PAMC-104 **firmware 0.8.0 and above**)

⑱ [Channel Selection] : Select driving channel.

⑲ [# of Pulses] : Can set number of driving pulse.

⑳ [Pulse/Continuous] : Change driving mode.

㉑ [+] : Drive PAM to + direction（CW）.

㉒ [-] : Drive PAM to – direction（CCW）.

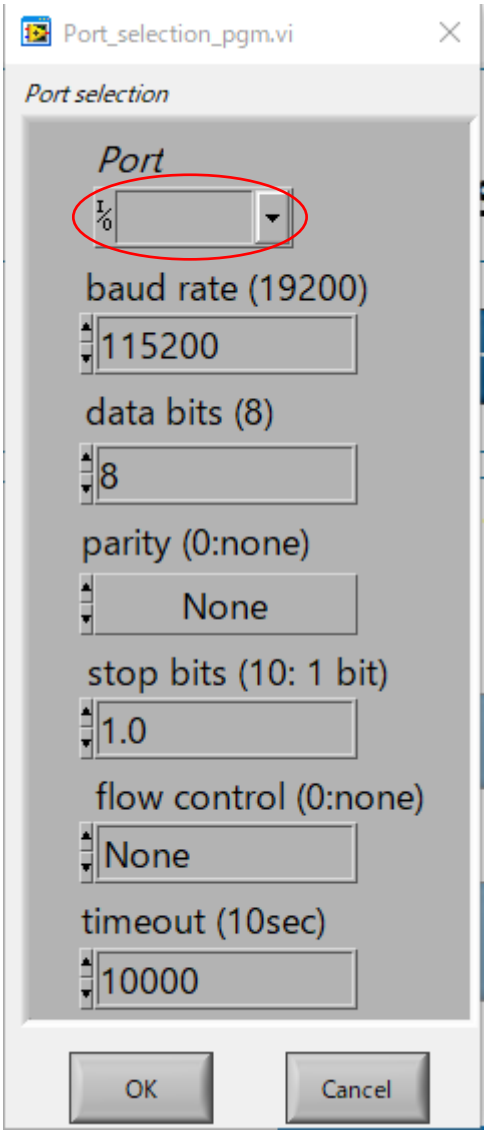
㉓ [Stop] : Stop driving operation.

㉔ [Exit] : Close software

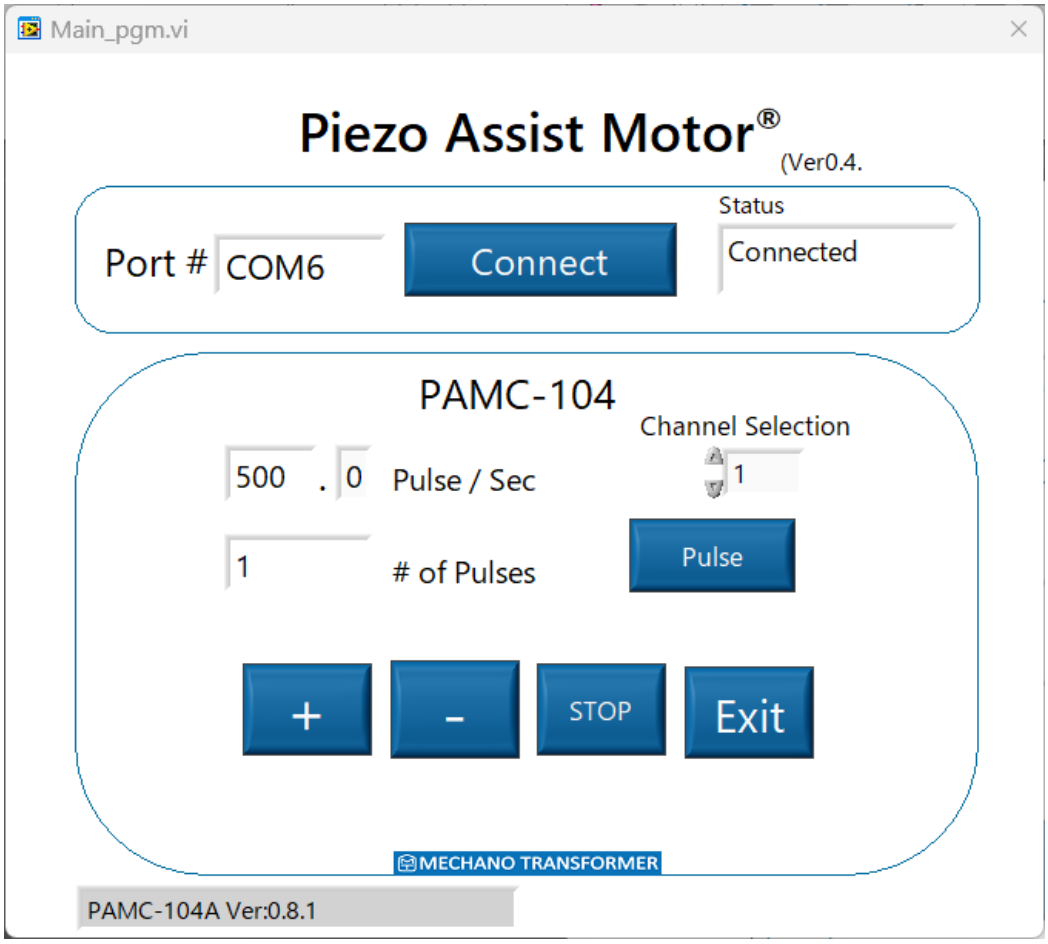
㉕ Version display ：Display PAMC-104 firmware version.

<Port selection window>

※Please confirm the port connected to the USB cable in device manager before selecting. The communication setting is as shown below.



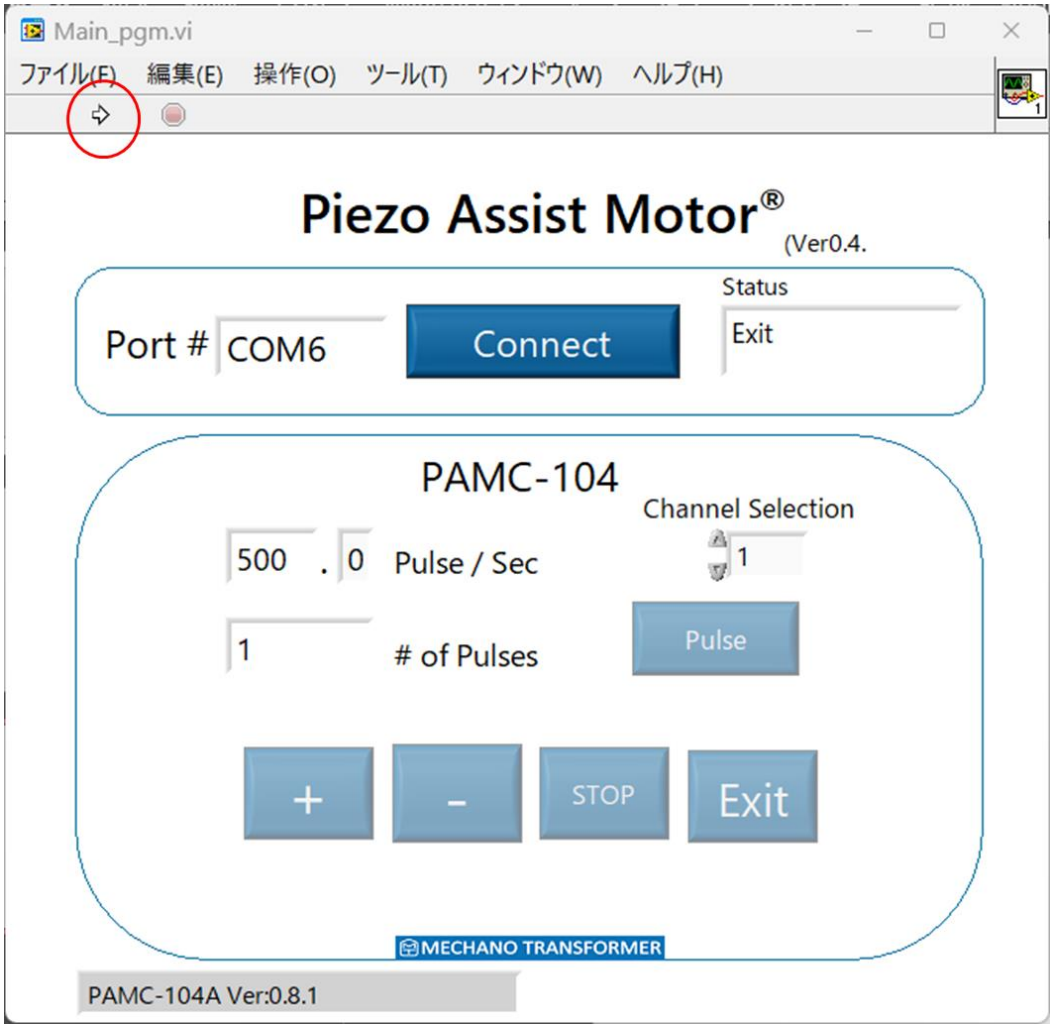
<Window after successful connection to PAMC-104>



<Window after exiting the application >

※To reconnect with the driver after exiting application：

Please click ⇨ .



6.3 Control Piezo Assist Motor using TeraTerm

1） Settings for communication between PAMC-104 and PC.

- Interface : RS232C
- Baud rate : 115200bps
- Data bit : 8bit
- Parity : None
- Stop bit : 1bit
- Flow control : None
- New-line Transmit: CR+LF
  Receive : CR+LF
- Local Echo : Check

2）Command to operate driver

① Connection Check command

- Command to confirm connection between PAM-104 and PC.

Command line:

>CON

Example:

>CON

>OK

② Firmware Version Check Command

- Command to check current PAMC-104 firmware.

Command line:

>**INF**

Example:

>**INF**

>PAM Ver0.8.0(115200bps)

③ Drive Command:

- Command to drive output with frequency, number of pulses and axis.

Command line:

NR/RR-OOOO/OOOO. O-△△△△/X△△△△△△△-☆

（No hyphen is needed when typing command）

（**OOOO. O and X△△△△△△△ is only applicable to firmware version 0.8.0 and above**）

Example:

（To control Axis 1：Drive PAM in clockwise direction with 1500HZ, 10 pulses）

>NR15000010A

>OK

④ Stop Command

- Stop the driving operation.

Command line：

＞S

Example：

＞S

＞FIN

・Command example：（To drive in continuous mode：NR01000000A）

（To stop the driver when driving in continuous mode）

＞NR01000000A

＞OK

＞S

＞FIN △△△△（Number of pulse driven）※

※Number of pulses driven will not be added from previous drive command

The counter will reset to 0 when the command “0000” is sent to the driver

Parameter：

NR/RR : PAM drive direction

(NR: Clockwise direction, RR: Anti-clockwise direction)

〇〇〇〇. 〇 : Frequency (0.1 ~ 1500.0 Hz) *Only applicable to firmware version 0.8.0 and above

〇〇〇〇 : Frequency (1 ~ 1500 Hz)

X△△△△△△ : Drive count (0000 ~ 9999 Pulses)
(0000: Continuous drive) *Only applicable to firmware version 0.8.0 and above

△△△△ : Drive count (0000 ~ 9999 Pulses)
(0000: Continuous drive)

☆ : Output channel (A~D)
(Axis1: A, Axis2: B, Axis3: C, Axis4: D)

**Note: to send command to PAMC-104 using other terminal or language such as python, ensure that the command line is ended with [CR][LF]

Message list:

Display Message	
OK	Command received properly
FIN	Driving operation ended
ERROR	Wrong command
BUSY	Currently driving

7. Caution During Handling

1. Please read and understand the Operation Instruction Manual before usage.
2. Only experienced technicians should handle the driver.
3. Do not disassemble or modify the driver.
4. Do not use the driver near any flammable materials or locations with high moisture or humidity.
5. Turn off the driver's power supply if abnormal smell, noise, overheating, heat dissipation are detected.
6. Do not turn on the driver after dropping or applying shock to driver.
7. Do not touch the PAM during operation.
8. Do not operate with wet hands.

MECHANO TRANSFORMER CORPORATION
4F BUILDX No.3,
2-7-12, Iwamoto-cho, Chiyoda-ku,
Tokyo 101-0032 Japan
Tel:03-5297-6088 FAX:03-5297-608

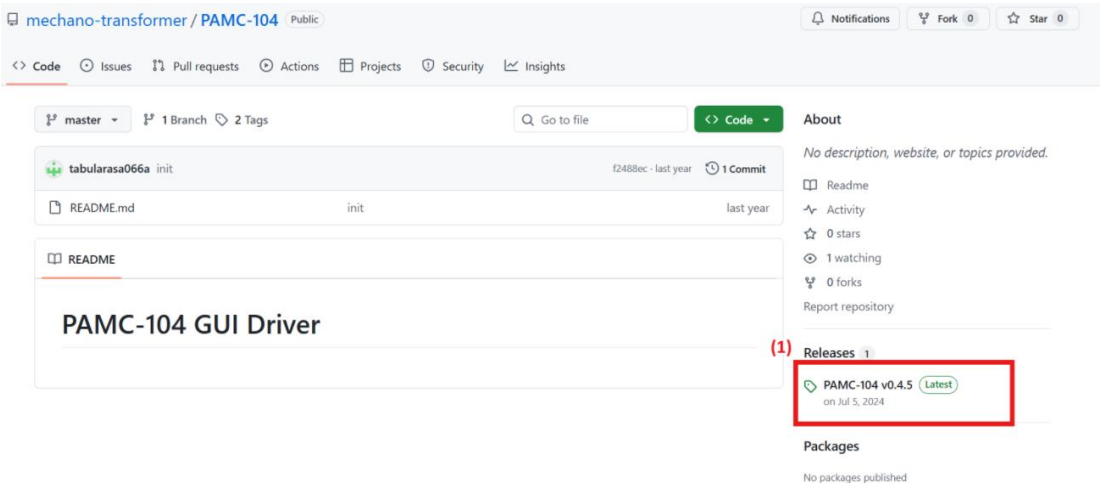
-APPENDIX 1-

Software Installation

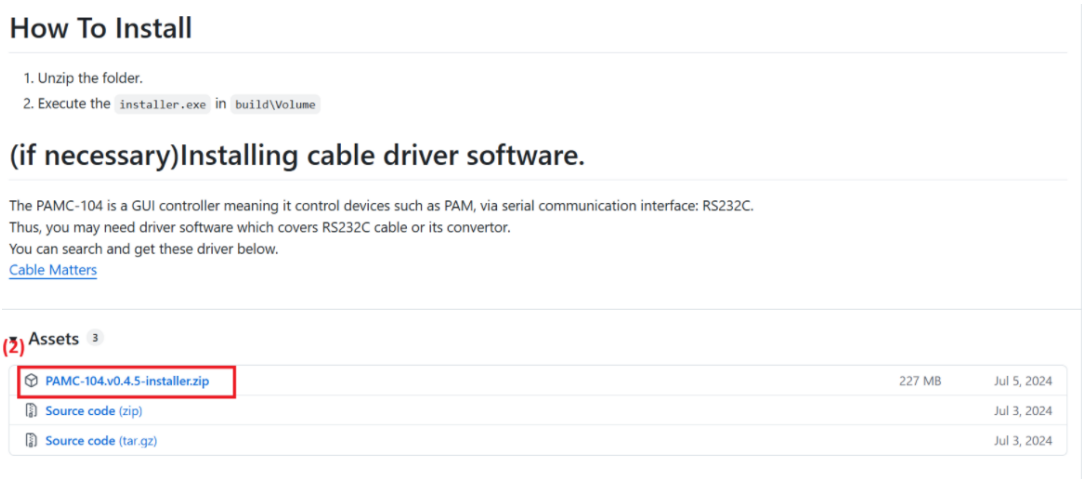
① Download the software installer from Github.

⇒https://github.com/mechano-transformer/PAMC-104

->Click (1)



Scroll down until (2) is visible and click (2). Installer will be automatically downloaded.



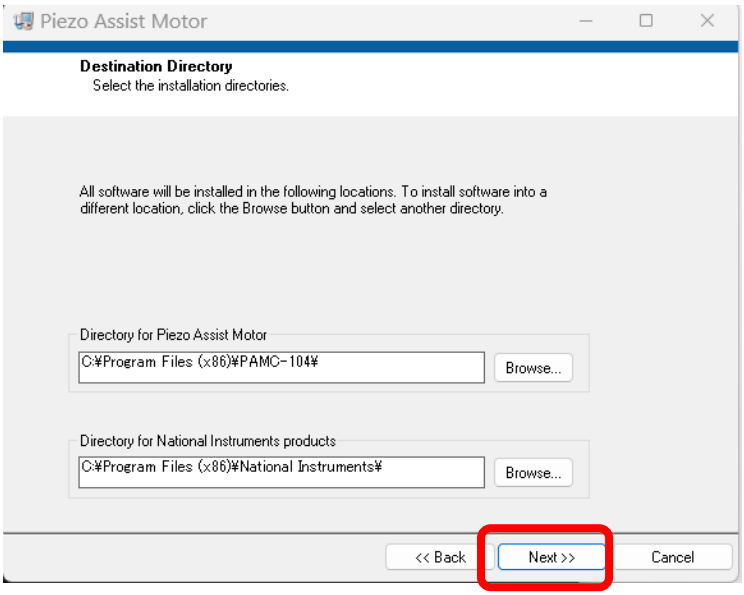
Extract the downloaded file.

② Executing Installer.exe

The below window will appear after extracting the installer compressed file.

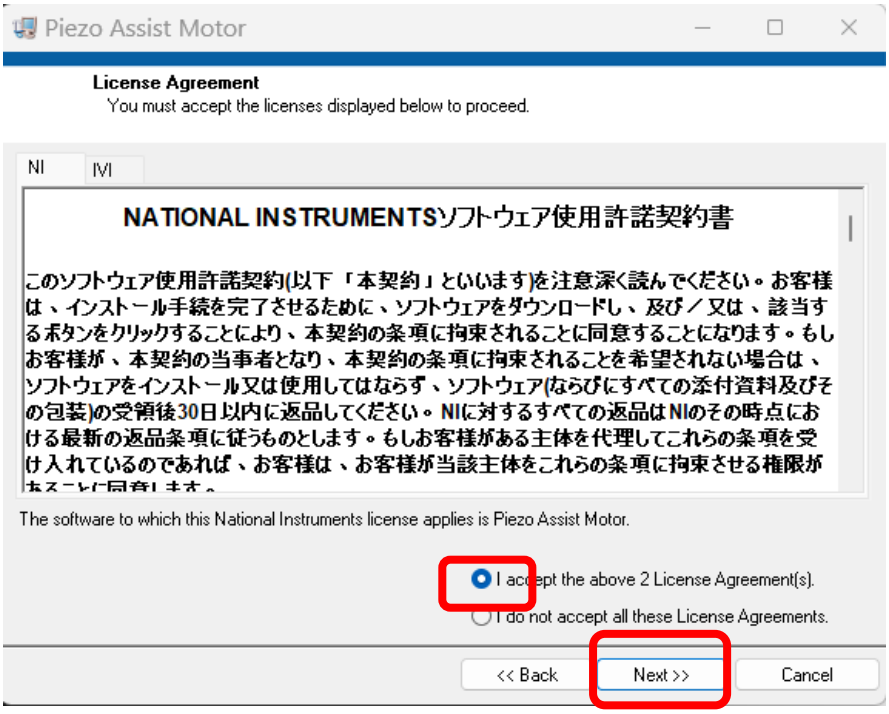
The installer will automatically install when opening Installer.exe.

③ Installation start



Designate the installation path. If the displayed path is correct, click the「Next」button. To install in different folder, click「Browse」button and navigate to the desired path.

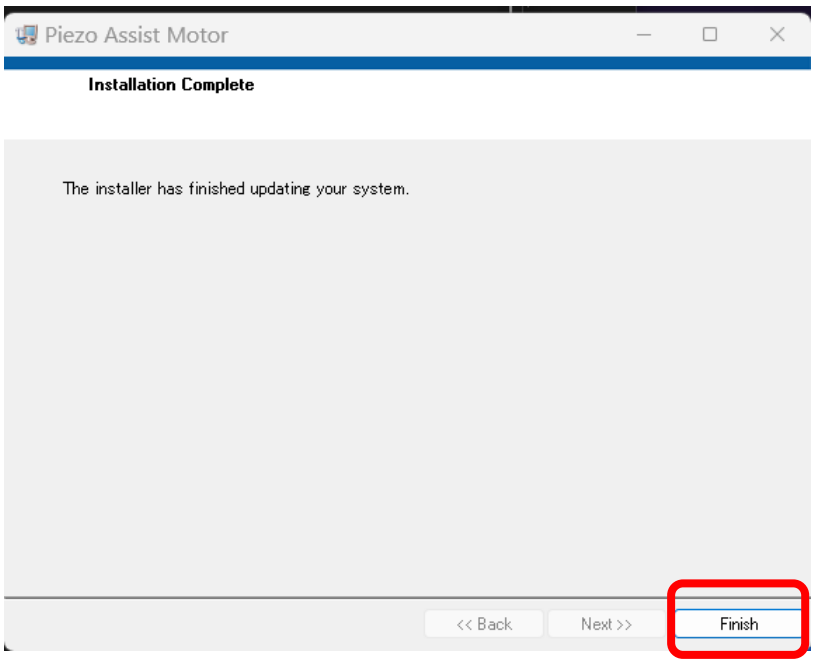
④ Software usage agreement



The license agreement to use the software will be displayed. If the agreement is accepted, please click the「Next」button. To terminate the installation without agreement, please click the「Cancel」button.

⑤ Finalize installation

After installation is completed, please click「Finish」button.



If connection with PAMC-104 failed when using the included USB-DSUB cable, please download the driver for the cable from the same link at Github by clicking (3)