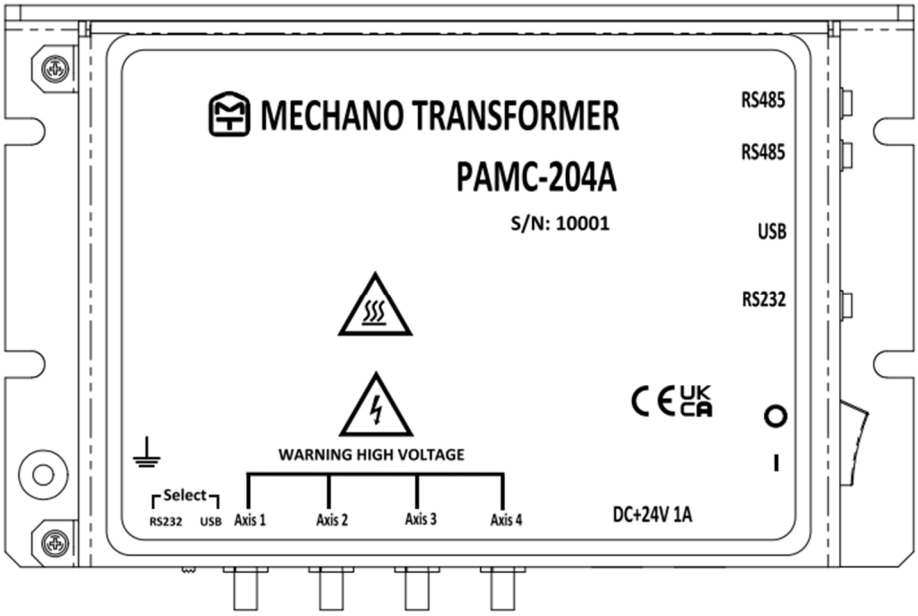
MECHANO TRANSFORMER
Specialist of Precision Piezo-Actuators

PAMC-204A

PIEZO ASSIST MOTOR CONTROLLER

OPERATION MANUAL



Revision History

Version number	Date	Revised content	Edited by	Approved by
0.1	20250225	English First Edition Ver0.1	Masahiro Tsuda	Chee Sze Keat

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Technical Support Contacts

Tokyo, Japan
Mechano Transformer Corporation
4F BUILDX No.3,
2-7-12, Iwamoto-cho, Chiyoda-ku,
Tokyo 101-0032 Japan
Tel:03-5835-0108 FAX:03-5835-0109

Mechano Transformer Corporation Calling Procedure

If there are any defects in material or workmanship or any failure to meet specifications, promptly notify Mechano Transformer Corporation by calling 03-5835-0108 or by visiting our website at www.mechano-transformer.com. Within the warranty period, return the product to Mechano Transformer Corporation. Mechano is not responsible for damage occurring in transit and is not obliged to accept products returned if the warranty seals are broken.

E-mail: info@mechano-transformer.com

When contacting Mechano Transformer Corporation for technical support, it is essential to provide specific details to help the customer care representative diagnose:

1. Your Contact Information, including your name, phone number, and email address
2. Product's serial number or original order number
3. Describe the issue, specifying whether it relates to hardware or software.

Additionally, be prepared to answer diagnostic questions, such as whether the system is used for manufacturing or research and development, and what the system's state was before the issue occurred. If the problem has been encountered before, mention how frequently it happens. It is also important to indicate whether the system can still operate despite the issue or if it has become non-functional. Lastly, identify any changes or events that may have contributed to the problem, such as recent updates, modifications, or environmental factors. Providing these details will allow the technical support team to analyze the situation thoroughly and offer an effective solution.

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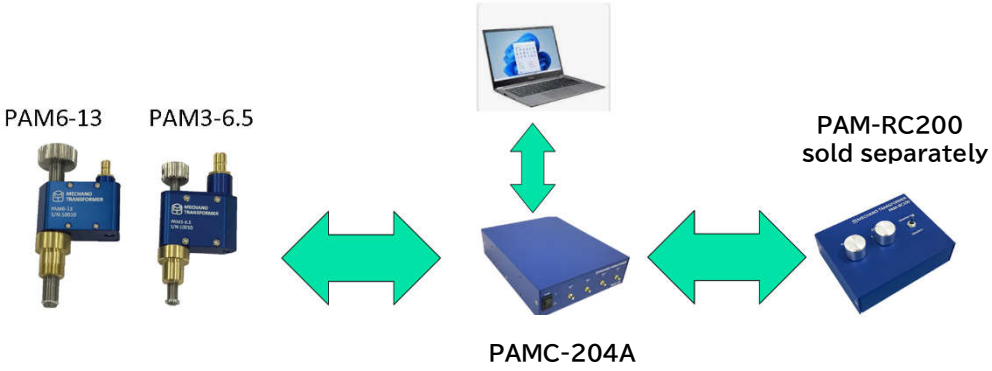
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1 Product Overview

PAMC-204A is specifically designed to control and drive Piezo Assist Motor (PAM). One PAMC-204A can connect up to four PAMs and drive one PAM at a time. A PC connected via USB, RS485, or RS232C can easily control it using serial communication software such as Tera Term. The output voltage of PAMC-204A can be adjusted by command to get more precise movement of PAM.



Features of PAMC-204A

- Stackable system for compact installation
- Plug-and-play USB interface
- RS232C and RS485 interface
- Overheat protection
- Adjustable output for different movement speed

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2 Safety Precautions

The following terms and symbols are used in this documentation and appear on the PAMC-204A where safety-related issues may occur.

2.1 Explanation of Symbols

2.1.1 Electric Shock



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

2.1.2 Caution, Hot Surface



Hot Surface Symbol shown in this manual and on products warns of high temperature. Touching the surface may cause burns or injury. Handle them with care and follow all safety precautions.

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2.1.3 ON Switch Symbol



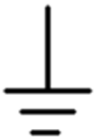
The symbol shown in the figure indicates the power switch position on Model PAMC-204A. It signifies that the device is in the Power On state.

2.1.4 OFF Switch Symbol



The symbol shown in the figure indicates the power switch position on the Model PAMC-204A. It signifies that the device is in the Power Off state.

2.1.5 Ground



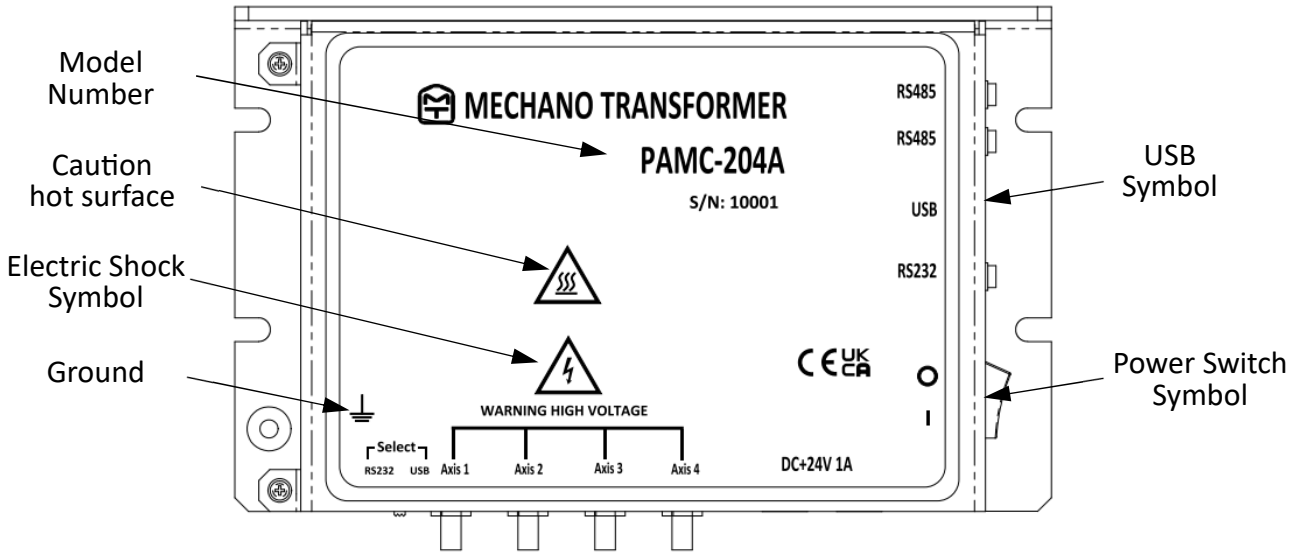
The symbol above indicates the screw to be used to ground the case of the product. This symbol identifies the frame or chassis terminal.

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2.2 Warnings and Cautions

1. Read and understand this manual before usage.
2. The product should be handled only by experienced technicians.
3. Do not disassemble or modify the product.
4. Do not use the product near flammable materials or in locations with high humidity.
5. Turn off the power supply if an abnormal smell, noise, or overheating is detected.
6. Ensure the power is switched off before connecting to the power source.
7. Do not turn on the product if it has been dropped or subjected to impact.
8. Do not touch PAM during operation.
9. Do not operate with wet hands.

2.3 Locations of Labels and Warnings



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3 Package Contents

3.1 Included Items

The following items are included in the standard package:

1. PAMC-204A device
2. USBAB-MM-1.5: USB Type A – Type B Cable (USB cable)
3. 2.1DC-MM-03: DC power link cable
4. 3.5COMC-MM-0.4: mini-plug cable

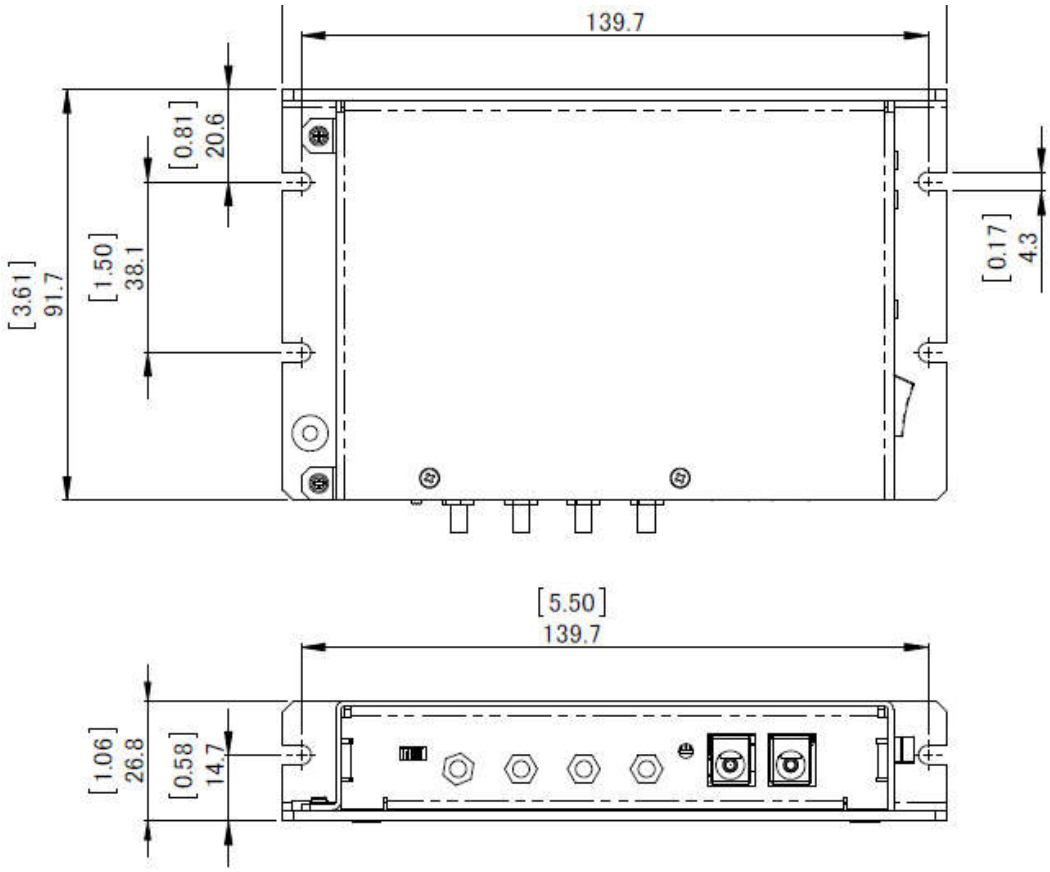
3.2 Optional Accessories

1. MT-UNI345-2419-PL03B: DC 24V 1.9A Power Adapter
2. PAM-RC200: Manual controller
3. Linking Plate

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4 Weight and Dimensions

Weight	350 g (12.35 oz)
Dimensions	(L x W x H) 5.84 in x 3.61 in x 1.06 in 148.3 mm x 91.7 mm x 26.8 mm



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5 Product Specifications

5.1 Electrical Characteristics

Electrical Characteristics	PAMC-204A
Input Voltage	24 V
Current consumption	0.5 A max
Operating temperature	5~40 °C
Storage temperature	-20~60 °C[1)]
Storage humidity	20~80%
Weight	0.35 kg
Number of axes	4
Maximum frequency	1500 Hz
Output Voltage	70~150 V[2)]

Notes:

1) **No condensation**
2) **Output voltage adjustable by command**

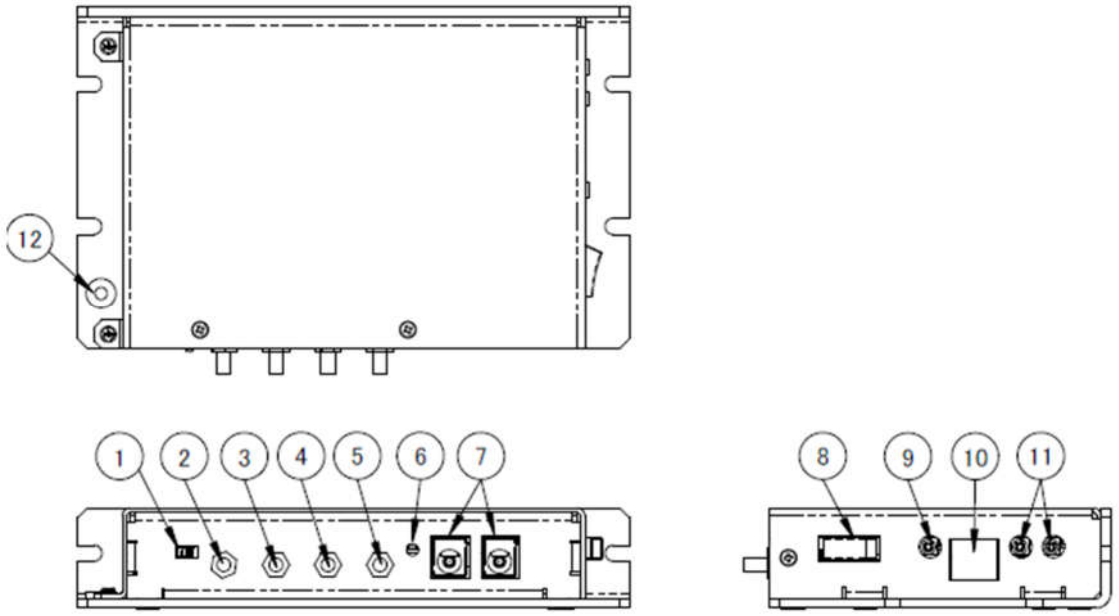
5.2 Communication Specifications

Communications	PAMC-204A
Interface	USB Serial/RS232C/RS485 protocol
Baud Rate	115200 bps
Data Bit	8 Bit
Parity	None
Stop Bit	1 Bit
Flow Control	None
Delimiter	CR + LF

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5.3 PAMC-204A Parts



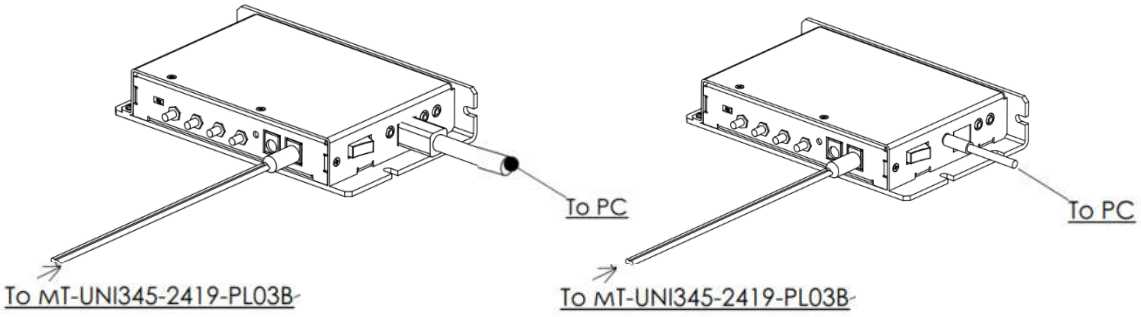
Item No	Parts Description
1	Select Switch for USB/RS232C
2	Axis 1
3	Axis 2
4	Axis 3
5	Axis 4
6	Power LED The light will come on after the power is turned on if PAMC-204A is functioning properly.
7	DC Power Terminal
8	Power Switch
9	RS232C Communication Port
10	USB Port
11	RS485 Communication Port
12	Case Ground

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6 Operation Instructions

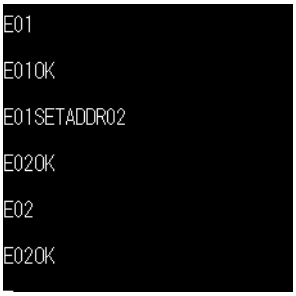
6.1 Before Using

The addresses of all PAMC-204As are set to **E01** at the factory. When using a daisy chain setup, change the address of each PAMC-204A using the following steps:



USB connection RS232C connection

1. Select [USB] with the select switch on the PAMC-204A.
2. Connect only one PAMC-204A to the PC. (Same as the single PAMC-204A setup)
3. Use Tera Term or a similar tool to communicate with PAMC-204A.
4. Use the command “E01SETADDRnn” to change the address. (nn: 01-32, refer to section 6.4 and section 6.5 for more details on command)

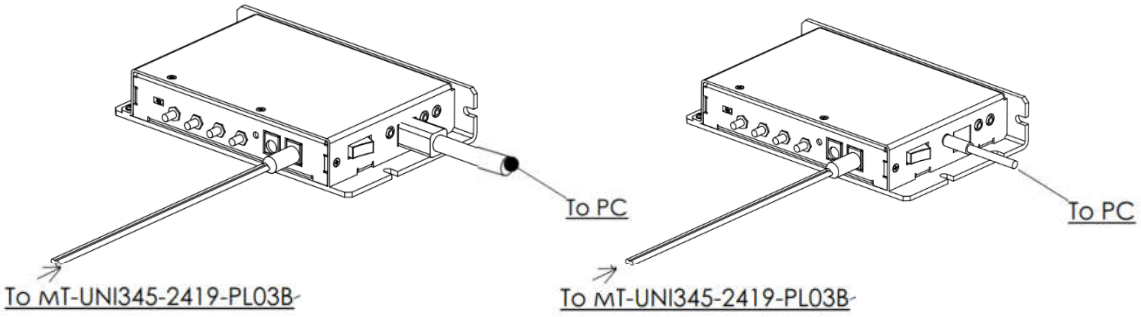


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6.2 PAMC-204A Setup

6.2.1 Single PAMC-204A Setup

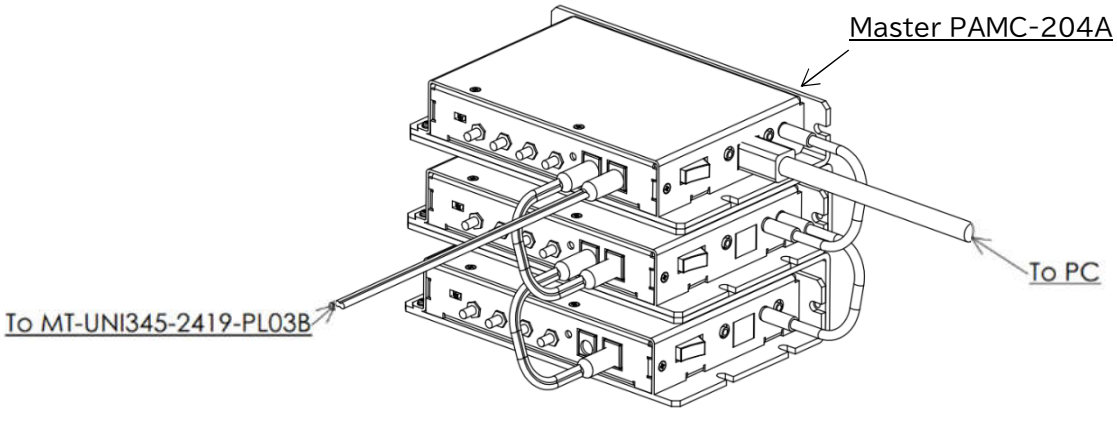


USB connection RS232C connection

1. Select [USB] or [RS232C] with the select switch on the PAMC-204A.
2. Connect PAMC-204A to the power adapter (MT-UNI345-2419-PL03B), PC and PAMs.
3. Turn on the power switch.
4. Open serial connection to PAMC-204A using Tera Term or a similar tool.
5. Send commands to PAMC-204A.

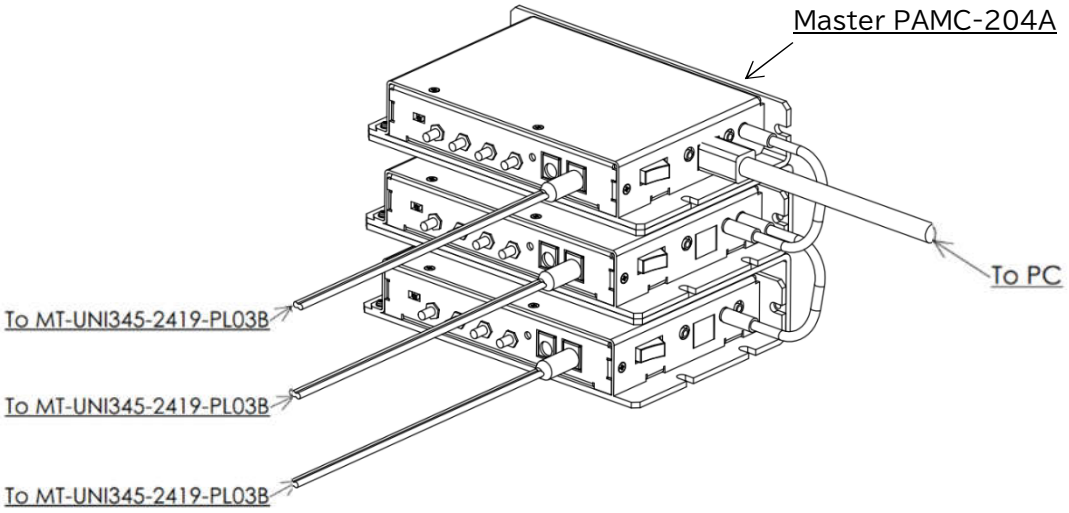
Note: Ensure that the power of PAMC-204A is switched off before connecting power source.

6.2.2 Daisy Chain Setup



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1. Connect power adapter (MT-UNI345-2419-PL03B) to each PAMC-204A or to the DC power terminal of the first PAMC-204A and link the DC power terminal of other PAMC-204As with the DC connector.
2. Connect PAMC-204As to PAMs.
3. Connect the first PAMC-204A's USB port to the PC.
4. Connect the RS485 ports of all the PAMC-204As using cables.
5. Send commands to the respective PAMC-204A.

Note: The optional item MT-UNI345-2419-PL03B and 2.1DC-MM-03 can only support up to 3 PAMC-204A at a time. For 4 or more PAMC-204As, use additional power adapters and cables.

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6.3 Instructing PAMC-204A

6.3.1 Using PAMC-204A Software

Note:

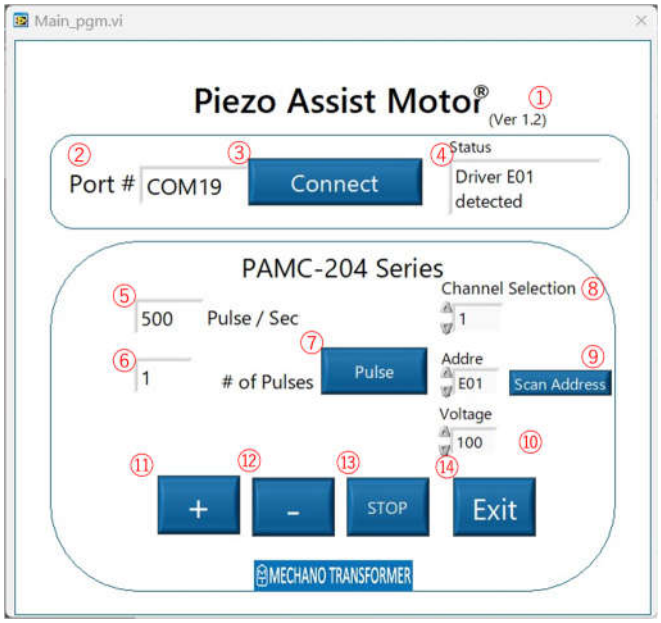
1. **The software ver1.2 is only usable with connection using USB cable.**
2. **One PAMC-204A can drive only one PAM at a time. When you drive another PAM using the same PAMC-204A, the controller will automatically stop the current PAM driving.**

Software Installer

**PAMC-204A Software Installer can be downloaded from the link below.

->https://github.com/mechano-transformer/PAMC-204

Software window explanation.



No	Name	Function
1	Version	Shows the software version
2	Port#	Currently connected serial port

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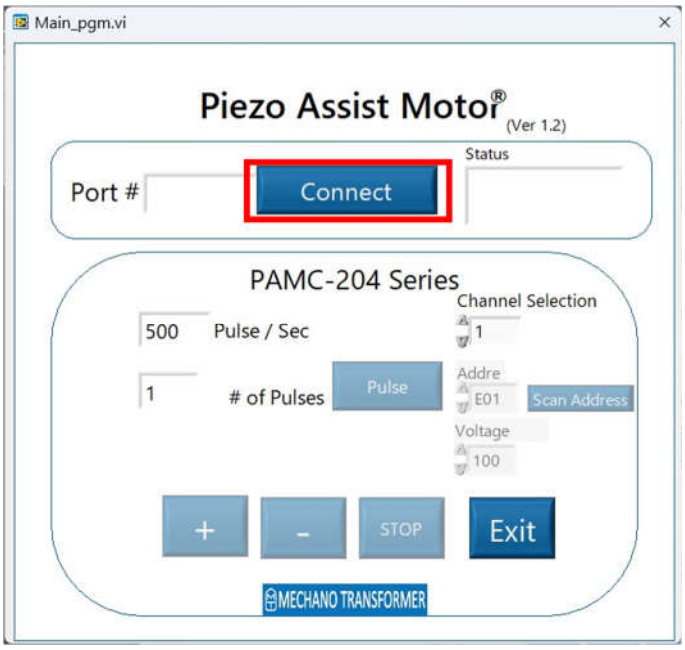
3	Connect	Port selection
4	Status	Shows whether the address exists in the network or driving channel and direction
5	Pulse/Sec	Set the frequency. The frequency range is 1-1500.
6	# of Pulses	Set the number of pulses to drive during pulse driving mode. The maximum pulse is 9999.
7	Pulse/Continuous	Driving mode selection
8	Channel Selection	Choose an axis to output
9	Address/Scan address	Select the address to output. If the address does not exist in the network, all other buttons will be disabled. [Scan address] can scan the addresses of all connected PAMC-204As
10	Voltage Setting	Change the output voltage. Use this button to adjust the output voltage to a higher value for faster movement or a lower value for minute movement. The currently shown Voltage value is the output of the driver
11	+	Drive the PAM for plus rotation.
12	-	Drive the PAM for minus rotation.
13	STOP	Stop the driving operation.
14	EXIT	Close the software.

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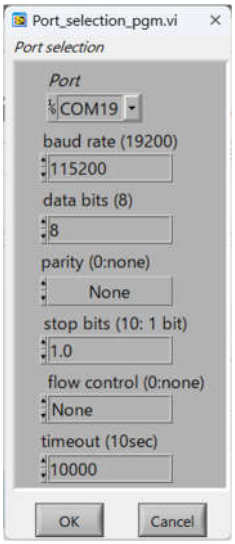
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Using the software.

1. Connect PAMC-204A to the PC using a USB cable.
2. Open the software.
3. Press the connect button to open the serial port settings window.



4. Select a port of PAMC-204A and press OK.

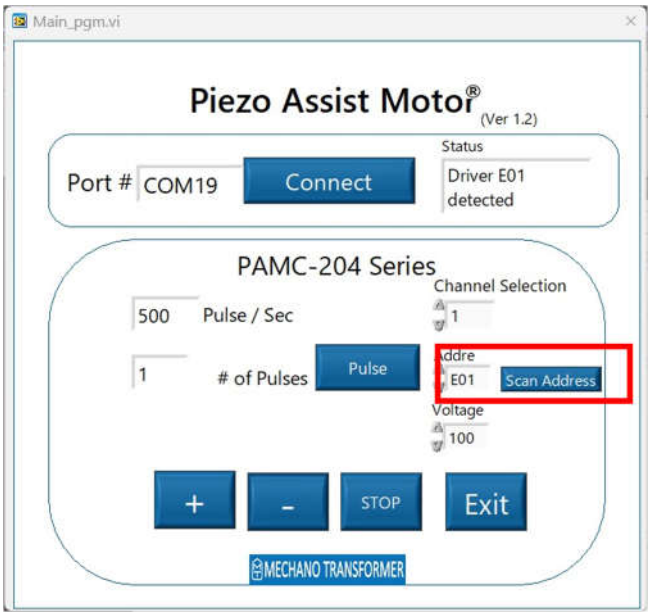


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5. If successful, the window will show the addresses of connected PAMC-204As.

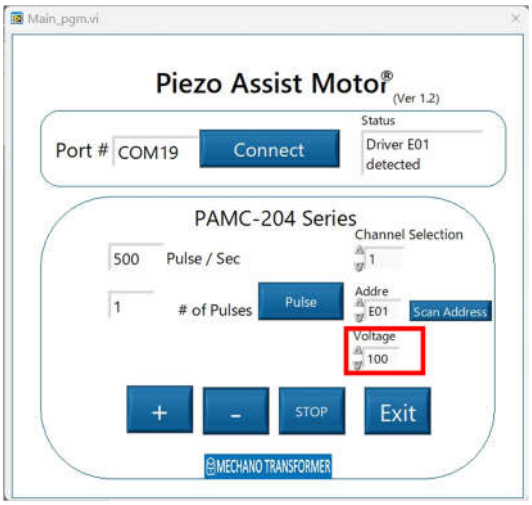


6. Select the address of the desired PAMC-204A.

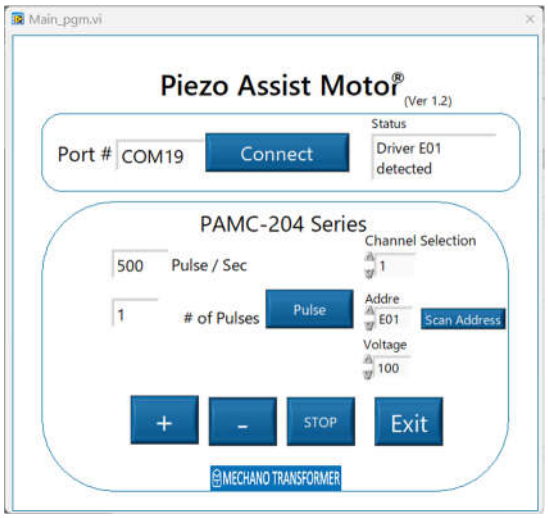


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7. To change the output voltage, select the desired output voltage level.



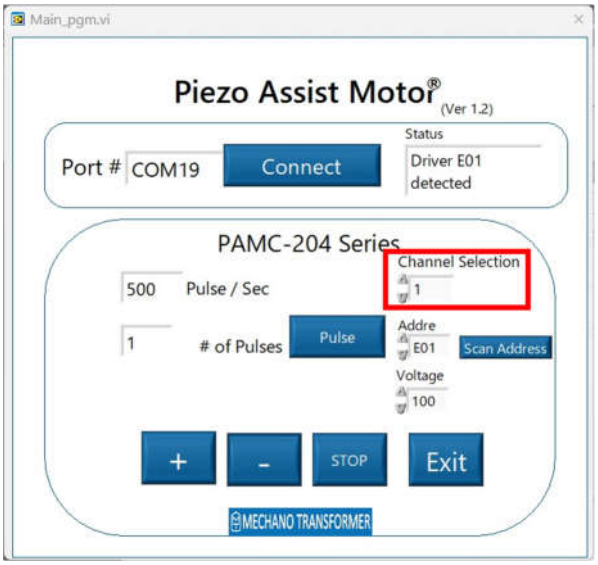
8. Set the frequency and driving mode between [Pulse] and [Continuous]. For pulse mode, set the desired number of pulses to drive.



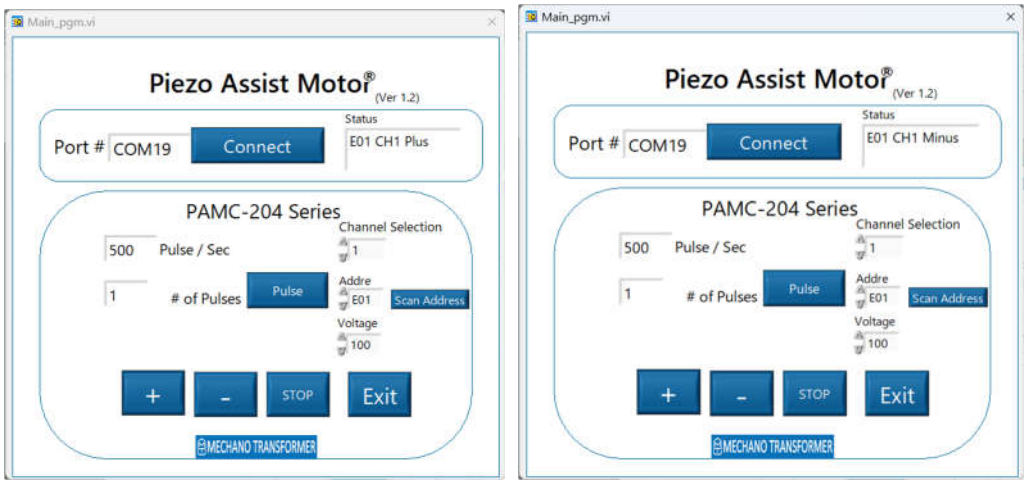


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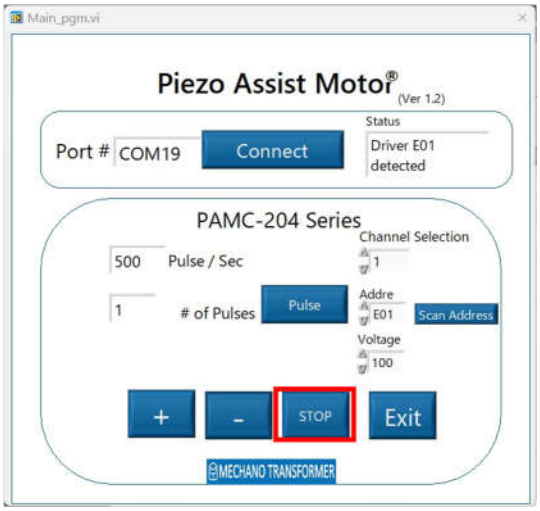
9. Select the desired channel.



10. Press the [+] button for plus rotation or [-] button for minus rotation.

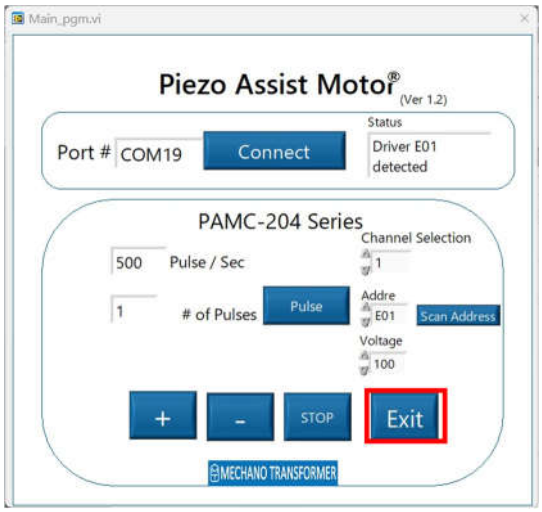


11. When the driving mode is continuous, press the [STOP] button to halt the driving operation.



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12. Press [EXIT] to shut down the software.



Note:

If PAMC-204As are disconnected while using the software, there are risks of errors and timeouts occurring. In such cases, press the [EXIT] button first and press the arrow button highlighted below or restart the software.



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6.3.2 Using Tera Term

1. Connect to PAMC-204A using a USB cable.
2. Set the terminal and serial port settings as follows:

Terminal settings		PAMC-204A
Newline	Receive	CR + LF
	Transmit	CR + LF
Local Echo		On (Checked)

Serial port settings

Serial port settings	PAMC-204A
Baud Rate	115200 bps
Data Bit	8 Bit
Parity	None
Stop Bit	1 Bit
Flow Control	None
Delimiter	CR + LF

3. Enter the desired command and press [ENTER]. (Refer to section 6.4 and section 6.5 for command list and details)

Note:

1. **One PAMC-204A can drive only one PAM at the same time.**
2. **When a PAMC-204A drives a PAM with a channel, inputs of the drive commands to activate another channel are invalid.**

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6.3.3 Manual Control using PAM-RC200



1. Set the select switch of PAMC-204A as USB.
2. Connect PAM-RC200 to PAMC-204A with a USB A-B cable.
3. Select a channel number to drive with Channel Knob.
4. Select “+” rotation or “- “rotation.
5. Increase the driving frequency with Frequency Knob to an appropriate speed.

* The PAM stops when the cable is disconnected. PAMC-204A is not affected.

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6.4 Command List

Below is a list of commands that can be sent to PAMC-204A.

No	Command	Details
1.	ExxINF	Check Firmware Version
2.	Exx	Check if PAMC-204A with address exists in network
3.	ExxSETADDRnn	Change the address of PAMC-204A
4.	ExxDACnnnn	Set drive voltage
5.	ExxNRnnnnyyyyz ExxNRnnnnXyyyyyyz	+Rotation drive Command
6.	ExxRRnnnnyyyyz ExxRRnnnnXyyyyyyz	-Rotation drive Command
7.	ExxS	Stop the current specific driving operation
8.	ExxST?	Check current driving operation status
9.	ExxTXFINn	Enable or disable driven pulse number reply after stopping driving operation
10.	ExxSNO?	Check the serial number of PAMC-204A
11.	ExxAB	Stop a PAM driven by the specific PAMC-204A
12.	ExxmACnnnnnn	Set acceleration*
13.	ExxmAC?	Check current acceleration*
14.	ExxmDHnnnn	Set the home position*
15.	ExxmDH?	Check the home position*
16.	ExxmMD?	Check the status of operation complete*
17.	ExxmMVn	Move continuously*
18.	ExxmMV?	Check the motion condition*
19.	ExxmPAnnnn	Move to a target position*
20.	ExxmPA?	Check the target position (absolute)*
21.	ExxmPRnnnn	Move to a relative position*
22.	ExxmPR?	Check the target position after a relative move (returned as absolute)*
23.	ExxmST	Stop the specified PAM moving*
24.	ExxmTP?	Check the current position*
25.	ExxmVAnnnn	Set the moving speed*

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26.	ExxmVA?	Check the moving speed*

* These commands can be used with firmware ver0.2.2 and later.

6.5 Command Description

Below is the detailed description of commands listed in section 6.4.

Note: 1 step is equivalent to 1 pulse and vice versa.

ExxINF

Description	Check firmware version
Syntax	ExxINF
Detail	This command allows users to confirm the current firmware version. Use this command to read the firmware version for reference when contacting technical support.

Argument	Value	Description
xx	01-32	Address of the target PAMC-204A

Example	E01INF	(Send command to PAMC-204A E01)
	>PAMC-NEWTYPE **Ver:0.2.2(115200bps)**	(PAMC-204A E01 replies with firmware version number)

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Exx

Description	Check if the PAMC-204A with xx address exists in the network
Syntax	Exx
Detail	This command allows users to confirm whether the PAMC-204A with address xx is connected to the network or PC.

Argument	Value	Description
xx	01-32	Address of the target PAMC-204A

Example

E01 (Send command to PAMC-204A E01)
>**E01OK** (PAMC-204A E01 replied)
E02 (Send command to PAMC-204A E02)
> (No response)

ExxSETADDRnn

Description	Change the address of connected PAMC-204A
Syntax	ExxSETADDRnn
Detail	This command allows users to change the address of connected PAMC-204A. **Note: Use a single setup (section 6.2.1) to change the address of PAMC-204A**

Argument	Value	Description
xx	01-32	Current PAMC-204A's address
nn	01-32	New address of the PAMC-204A

Example

E01SETADDR02 (Send command to PAMC-204A E01 to change address to E02)
>**E02OK** (PAMC-204A replied, address change successful)

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ExxDACnnnn

Description Change the voltage output

Syntax ExxDACnnnn

Detail This command allows users to change the output voltage. For precise minute movement, set the voltage level below 100 V. It is recommended to set output voltage to 70 V for minute movement. For fast movement, set the output voltage to 100 V and above.

Argument	Value	Description
xx	01-32	Address of the target PAMC-204A
nnnn	4095	150 V
	3750	140 V
	3450	130 V
	3200	120 V
	3000	110 V
	2700	100 V
	2450	90 V
	2200	80 V
	1900	70 V

Example

E01DAC4095 (Send command to change PAMC-204A E01 output voltage to 150 V)

>**E01OK** (PAMC-204A E01 replied, voltage change successful)

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ExxNRnnnnyyyyz / ExxNRnnnnXyyyyyyz

Description +Rotation drive command

Syntax ExxNRnnnnyyyyz
ExxNRnnnnXyyyyyyz

Detail This command allows users to order a specific PAMC-204A and one of its channels to drive the connected PAM for + rotation movement. The range of frequency possible is between 1-1500 Hz. The possible number of pulses is 0000~9999. Adding "X" allows a 6-digit pulse count (000000–999999). If the number of pulse input is set to 0, PAMC-204A will drive the PAM for + rotation movement continuously until a stop command is given.

Argument	Value	Description
xx	01-32	Address of the target PAMC-204A
nnnn	0001-1500	Driving frequency
yyyy	0000~9999	Number of pulses driven (4 digits, 0000= continuous driving)
yyyyyy	000000~999999	Number of pulses driven (6 digits, with X, 000000= continuous driving)
z	A~D	Driving channel (A: CH1, B: CH2, C:CH3, D:CH4)

Example

E01NR15001500A	(Send command to PAMC-204A E01 to drive the CH1 PAM in the + direction with frequency 1500 Hz with 1500 pulses)
>**E01OK**	(PAMC-204A E01 replied, command received successfully)
E01NR15000000A	(Send command to PAMC-204A E01 to drive the CH1 PAM in the + direction with frequency 1500 Hz continuously)
>**E01OK**	(PAMC-204A E01 replied, command received successfully)
E01NR1500X100000A	(Send command to PAMC-204A E01 to drive the CH1 PAM in the +

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	direction with frequency 1500 Hz with 100000 pulses)
>E01OK	(PAMC-204A E01 replied, command received successfully)

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ExxRRnnnnyyyyz / ExxRRnnnnXyyyyyyz

Description -Rotation drive command

Syntax ExxRRnnnnyyyyz
ExxRRnnnnXyyyyyyz

Detail This command allows users to order a specific PAMC-204A and one of its channels to drive the connected PAM for - rotation movement. The range of frequency possible is between 1-1500 Hz. The possible number of pulses is 0000~9999. Adding "X" allows a 6-digit pulse count (000000–999999). If the number of pulse input is set to 0, PAMC-204A will drive the PAM for - rotation movement continuously until a stop command is given.

Argument	Value	Description
xx	01-32	Address of the target PAMC-204A
nnnn	0001-1500	Driving frequency
yyyy	0000~9999	Number of pulses driven (4 digits, 0000= continuous driving)
yyyyyy	000000~999999	Number of pulses driven (6 digits, with X, 000000= continuous driving)
z	A~D	Driving channel (A: CH1, B: CH2, C:CH3, D:CH4)

Example

E01RR15001500A	(Send command to PAMC-204A E01 to drive the PAM of CH1 to - rotation with frequency 1500 Hz with 1500 pulses)
>**E01OK**	(PAMC-204A E01 replied, command received successfully)
E01RR15000000A	(Send command to PAMC-204A E01 to drive the CH1 PAM in the - direction with frequency 1500 Hz continuously)
>**E01OK**	(PAMC-204A E01 replied, command received successfully)
	(Send command to PAMC-204A E01

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E01RR1500X100000A	to drive the CH1 PAM in the - direction with frequency 1500 Hz with 100000 pulses)
>E01OK	(PAMC-204A E01 replied, command received successfully)

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ExxS

Description Stop current driving operation

Syntax ExxS

Detail This command allows users to stop the driving operation of the specific PAMC-204A. This command is essential when driving the PAM in continuous driving mode. If ExxTXFIN1 is sent to the driver beforehand, the driver will reply with number of pulses driven during the continuous driving mode. Otherwise, nothing will be returned.

Argument	Value	Description
xx	01-32	Address of the target PAMC-204A

Example

E01TXFIN0	(Send command to disable the driven pulse transmission from PAMC-204A E01)
>E01OK	(PAMC-204A E01 replied, the number of driven pulses will not be transmitted after stopping driving operation)
E01NR15000000A	(Send command to PAMC-204A of E01 to drive CH1 PAM at 1500 Hz continuously)
>E01OK	(PAMC-204A E01 replied, start driving operation)
E01S	(Send command to PAMC-204A E01 to stop driving operation)
>	(PAMC-204A E01 stopped, no transmission)
E01TXFIN1	(Send command to enable the driven pulse transmission from PAMC-204A E01)
>E01OK	(PAMC-204A E01 replied, driven pulse will be sent after stopping driving operation)
E01NR15000000A	(Send command to PAMC-204A E01 to

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	drive CH1 PAM at 1500 Hz continuously)
>E01OK	(PAMC-204A E01 replied, start driving operation)
E01S	(Send command to PAMC-204A E01 to stop driving operation)
>E01FIN1023	(PAMC-204A E01 stops and transmits the number of driven pulses)

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ExxST?

Description Check current driving operation status

Syntax ExxST?

Detail This command allows users to check the current driving operation status.

Below is the list of returned replies:
S: Currently stopped
NRnnnnz: Currently rotating clockwise direction (+)
RRnnnnz: Currently rotating counter clockwise direction (-)
**nnnn: Driving frequency, z: Driving channel

Argument	Value	Description
xx	01-32	Address of the target PAMC-204A

Example

E01ST? (Send check driving operation status command to PAMC-204A E01 (currently stopped))

>**E01S** (PAMC-204A replied, currently stopped)

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ExxTXFINn

Description Enable or disable the reply of the driven pulse number after stopping driving operation

Syntax ExxTXFINn

Detail This command allows users to set whether PAMC-204A will send the number of pulses driven after stopping. Default setting is 0(OFF). If the number of pulses driven is required, set to 1.

Argument	Value	Description
xx	01-32	Address of the target PAMC-204A
n	0	Disabled
	1	Enabled

Example

E01TXFIN0	(Send command to disable the driven pulse transmission from PAMC-204A E01)
>E01OK	(PAMC-204A E01 replied, the number of driven pulses will not be transmitted after stopping driving operation)
E01NR15000000A	(Send command to PAMC-204A of E01 to drive CH1 PAM at 1500 Hz continuously)
>E01OK	(PAMC-204A E01 replied, start driving operation)
E01S	(Send command to PAMC-204A E01 to stop driving operation)
>	(PAMC-204A E01 stopped, no transmission)
E01TXFIN1	(Send command to enable the driven pulse transmission from PAMC-204A E01)
>E01OK	(PAMC-204A E01 replied, driven pulse will be sent after stopping driving operation)

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E01NR15000000A	(Send command to PAMC-204A E01 to drive CH1 PAM at 1500 Hz continuously)
>E01OK	(PAMC-204A E01 replied, start driving operation)
E01S	(Send command to PAMC-204A E01 to stop driving operation)
>E01FIN1023	(PAMC-204A E01 stops and transmits the number of driven pulses)

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ExxSNO?

Description Check the serial number of PAMC-204A

Syntax ExxSNO?

Detail This command allows users to check the serial number of PAMC-204A. The serial number is also printed on the top seal of PAMC-204A. Please include the serial number during any inquiry.

Argument	Value	Description
xx	01-32	Address of the target PAMC-204A

Example

E01SNO? (Send check serial number command to PAMC-204A E01)

>**E0110059** (PAMC-204A E01 replied, serial number is 10059)

ExxAB

Description Stop a PAM driven by the specific PAMC-204A

Syntax ExxAB

Detail This command allows users to stop motion of a PAM with any channel of the specific PAMC-204A.

Argument	Value	Description
xx	01-32	Address of the target PAMC-204A

Example

E01AB (Send stop command to PAMC-204A E01 during continuous driving mode. PAMC-204A E01 does not reply.)

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ExxmACnnnnnn

Description Set acceleration

Syntax ExxmACnnnnnn

Detail This command allows users to set the acceleration of desired PAM channel. The unit for this parameter is steps/s². The higher the value, the faster the PAM reaches the set speed.

Argument	Value	Description
xx	01-32	Address of the target PAMC-204A
m	1~4	Channel number of PAMC-204A (CH1–CH4)
nnnnnn	0~150000	Possible acceleration value

Example E011AC100000

(Send the command to PAMC-204A E01 to set the acceleration of CH1 PAM to 100000. PAMC-204A does not reply.)

ExxmAC?

Description Check current acceleration

Syntax ExxmAC?

Detail This command allows users to confirm the acceleration value of a PAM of the specified channel connected to PAMC-204A.

Argument	Value	Description
xx	01-32	Address of the target PAMC-204A
m	1~4	Channel number of PAMC-204A (CH1–CH4)

Example E011AC?

(Send the check acceleration for CH1 PAM command to PAMC-204A E01.)

>E0110000

(PAMC-204A E01 replies with the acceleration value of the PAM of CH1 as 10000.)

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ExxmDHnnnn

Description Set the home position

Syntax ExxmDHnnnn

Detail This command allows users to set the home position as an absolute value of a PAM connected to the specified channel of PAMC-204A.

Argument	Value	Description
xx	01-32	Address of the target PAMC-204A
m	1~4	Channel number of PAMC-204A (CH1–CH4)
nnnn	-2147483648 to +2147483647	Home position within the allowable range

Example E011DH1000 (Send the command to PAMC-204A E01 to set the home position of the PAM of CH1 of PAMC-204A as 1000. PAMC-204A E01 does not reply.)

ExxmDH?

Description Check the home position

Syntax ExxmDH?

Detail This command allows users to confirm the home position of a PAM of the specified channel connected to PAMC-204A.

Argument	Value	Description
xx	01-32	Address of the target PAMC-204A
m	1~4	Channel number of PAMC-204A (CH1–CH4)

Example E011DH? (Send the command to PAMC-204A E01.)

> E011000 (PAMC-204A E01 replies with the home position of the PAM of CH1 as 1000.)

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ExxmMD?

Description Check the status of operation complete

Syntax ExxmMD?

Detail This command allows users to confirm if the move operation has been completed or not.

PAMC-204A answers 1 when the move operation has been completed, or 0 when it has not been completed.

Argument	Value	Description
xx	01-32	Address of the target PAMC-204A
m	1~4	Channel number of PAMC-204A (CH1–CH4)

Example

E011MD? (Send the command to PAMC-204A E01.)

> E011 (PAMC-204A E01 replies as 1 as the PAM of CH1 is stopped.)

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ExxmMVn

Description Move continuously

Syntax ExxmMVn

Detail This command allows users to move a PAM connected with the specified channel of PAMC-204A continuously.

**When a PAM connected to another channel is operated, this command is invalid.

Argument	Value	Description
xx	01-32	Address of the target PAMC-204A
m	1~4	Channel number of PAM of PAMC-204A
n	+	Moving to direction “+”
	-	Moving to direction “-“

Example E011MV+ (Send the command to PAMC-204A E01.)
(The CH1 PAM of PAMC-204A E01 moves in the + direction continuously.)

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ExxmMV?

Description Check the motion condition

Syntax ExxmMV?

Detail This command allows users to confirm the PAM motion of the specified channel connected to PAMC-204A.

PAMC-204A answers 0 when the PAM is moving, or 1 when it is stopped.

Argument	Value	Description
xx	01-32	Address of the target PAMC-204A
m	1~4	Channel number of PAMC-204A (CH1–CH4)

Example

E011MV? (Send the command to PAMC-204A E01.)

> E011 (PAMC-204A E01 answers 1 as the PAM of CH1 is stopped.)

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ExxmPAnnnn

Description Move to a target position

Syntax ExxmPAnnnn

Detail This command allows users to move a PAM connected with the specified channel of PAMC-204A to position nnnn.

Argument	Value	Description
xx	01-32	Address of the target PAMC-204A
m	1~4	Channel number of PAMC-204A (CH1–CH4)
nnnn	-2147483648 to +2147483647	absolute position within the allowable range

Example E011PA1000

(Send the command to PAMC-204A E01.)

(The CH1 PAM of PAMC-204A E01 moves to absolute position 1000.)

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ExxmPA?

Description Check the target position (absolute)

Syntax ExxmPA?

Detail This command allows users to confirm the target position of the PAM connected to the specified channel of PAMC-204A.

** PAMC-204A answers the target position when the PAM is moving. It answers the current position when the PAM is stopped.

Argument	Value	Description
xx	01-32	Address of the target PAMC-204A
m	1~4	Channel number of PAMC-204A (CH1–CH4)

Example

E011TP?	(Confirmation of the PAMC-204A E01's CH1 PAM current position)
> E0120	
E011PA1000	(PAMC-204A E01 answers the current position.)
E011PA?	(Send the command to PAMC-204A E01.)
> E011000	(Check the target position of PAMC-204A E01's CH1 PAM while moving.)
E011ST	
E011PA?	(PAMC-204A E01 answers the CH1 PAM target position.)
> E01132	
E011TP?	(Stop the CH1 PAM of PAMC-204A E01.)
> E01132	(Check the target position of PAMC-204A E01's CH1 PAM while stopped.)
	(PAMC-204A E01 answers the CH1 PAM current position.)
	(Check the PAMC-204A E01's CH1 PAM current position.)
	(PAMC-204A E01 answers the CH1 PAM current position.)

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ExxmPRnnnn

Description Move to a relative position

Syntax ExxmPRnnnn

Detail This command allows users to move a PAM connected with the specified channel of PAMC-204A from the current position to nnnn steps.

Argument	Value	Description
xx	01-32	Address of the target PAMC-204A
m	1~4	Channel number of PAMC-204A (CH1–CH4)
nnnn	-2147483648 to +2147483647	Relative position within the allowable range

Example E011PR1000 (Send the command to PAMC-204A E01 CH1.) (The PAM of CH1 moves with 1000 steps in + direction from the current position.)

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ExxmPR?

Description Check the target position after a relative move (returned as absolute)

Syntax ExxmPR?

Detail This command allows users to confirm the target absolute position after a relative move of the PAM connected to the specified channel of PAMC-204A.

** PAMC-204A answers the target absolute position when the PAM is moving. It answers the current position when the PAM is stopping.

Argument	Value	Description
xx	01-32	Address of the target PAMC-204A
m	1~4	Channel number of PAMC-204A (CH1–CH4)

Example

E011TP?	(Confirmation of the PAMC-204A E01's CH1 PAM current position)
>E01123	
E011PR1000	(PAMC-204A E01 answers the CH1 PAM current position.)
E011PR?	(Send the command to PAMC-204A E01 CH1 PAM)
> E011123	(Check the target absolute position of PAMC-204A E01's CH1 PAM while moving.)
E011ST	(PAMC-204A E01 answers the target absolute position of CH1 PAM.)
E011PR?	(Stop the CH1 PAM of PAMC-204A E01.)
> E01545	(Check the target absolute position of PAMC-204A E01's CH1 PAM while stopped.)
E011TP?	(PAMC-204A E01 answers the CH1 PAM current position.)
> E01545	(Check the PAMC-204A E01's CH1 PAM's current position.)
	(PAMC-204A E01 answers the CH1 PAM's current position.)

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ExxmST

Description Stop the specified PAM moving

Syntax ExxmST

Detail This command allows users to stop motion of a PAM connected to the specified channel of the specified PAMC-204A

Argument	Value	Description
xx	01-32	Address of the target PAMC-204A
m	1~4	Channel number of PAMC-204A (CH1–CH4)

Example E011ST (Send stop command to PAMC-204A E01 during continuous driving mode to stop the PAM of CH1. PAMC-204A does not reply.)

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ExxmTP?

Description Check the current position

Syntax ExxmTP?

Detail This command allows users to confirm the current position of the PAM connected to the specified channel of PAMC-204A.

Argument	Value	Description
xx	01-32	Address of the target PAMC-204A
m	1~4	Channel number of PAMC-204A (CH1–CH4)

Example E011TP? (Send the command to PAMC-204A E01 CH1.)
> E0115400 (PAMC-204A E01 answers that the current position of the PAM of CH1 is 15400.)

ExxmVAnnnn

Description Set the moving speed

Syntax ExxmVAnnnn

Detail This command allows users to set the moving speed of a PAM connected to the specified channel of PAMC-204A.

Argument	Value	Description
xx	01-32	Address of the target PAMC-204A
m	1~4	Channel number of PAMC-204A (CH1–CH4)
nnnn	1-1500	Speed (steps/s) within the allowable range

Example E011VA1 (Send the command to PAMC-204A of E01 CH1.)
(The speed of the PAM of CH1 is set to 1.)

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ExxmVA?

Description Check the moving speed

Syntax ExxmVA?

Detail This command allows users to confirm the PAM speed of the specified channel connected to PAMC-204A.

Argument	Value	Description
xx	01-32	Address of the target PAMC-204A
m	1~4	Channel number of PAMC-204A (CH1–CH4)

Example

E011VA? (Send the command to PAMC-204A E01 CH1.)

>E011 (PAMC-204A E01 answers that current PAM speed of CH1 is 1 step/s.)

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6.6 Error Description

If an incorrect command or incorrect parameter is sent to PAMC-204A, it replies with an error message. Refer to the table below to determine the cause of error.

Error Message	Description
Error Value Range	The voltage setting value is out of range.
ERROR	Rotation argument is incorrect. Frequency argument is out of range. Channel set is out of range. No such command exists.
ERROR1	Invalid command format.
ERROR4	When setting pulse number with 6 digits, the number of pulses is out of range
ERROR5	When setting pulse number with 4 digits, the number of pulses is out of range
BUSY	PAMC-204A is in a driving operation. Stop current operation before entering new command.

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