MiSUMi

Linear motor actuator

E-RAM Series

EA100 Driver User Manual

Ver1.0

Thank you for purchasing our linear motor actuator.

This user manual is a supplement to the manufacturer's catalog, and its purpose is to provide users with more detailed and convenient usage instructions. We have attempted to ensure the accuracy and completeness of the content. Nevertheless, we recommend that users use the manufacturer's catalog as a guide.

Please take the time to read this manual carefully before use. Please keep it in a safe place so that you can view it whenever necessary.

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1. Driver Overview

1.1 Manufacturer Information

Driver manufacturer: Servotronix

Manufacturer's official website:https://www.servotronix.cn/en

The manufacturer model number table is as follows.

Misumi model number	Servotronix model number
EA100	CDHDE-0102AAP

1.2 Safety precautions

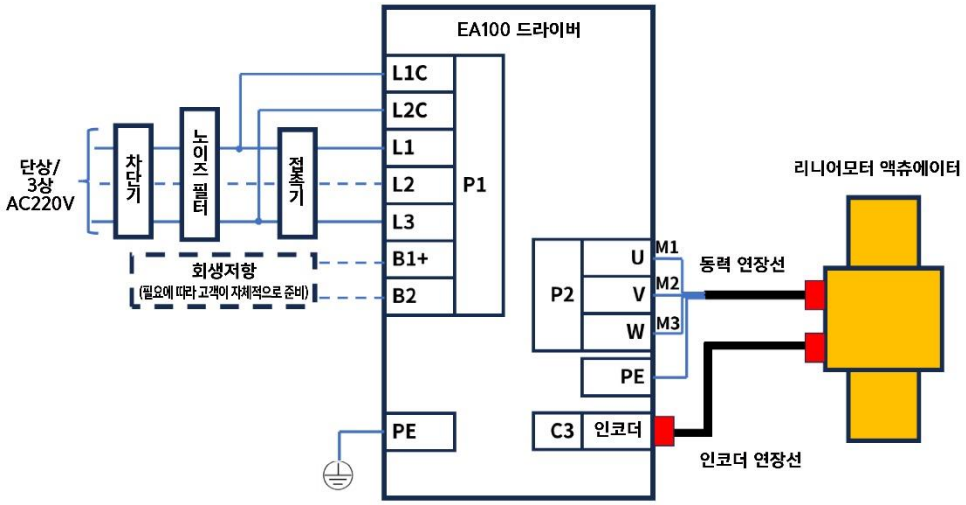
Before installation, please be sure to download and read all relevant materials from the manufacturer's website carefully, and use and operate the product exactly as required to ensure safety and accuracy.

Please use caution as improper handling may result in injury and/or equipment damage.

2. final

2.1 Main circuit

Driver rated input current 10A, maximum current 30A



2.2 Control circuit

● I/O port definition

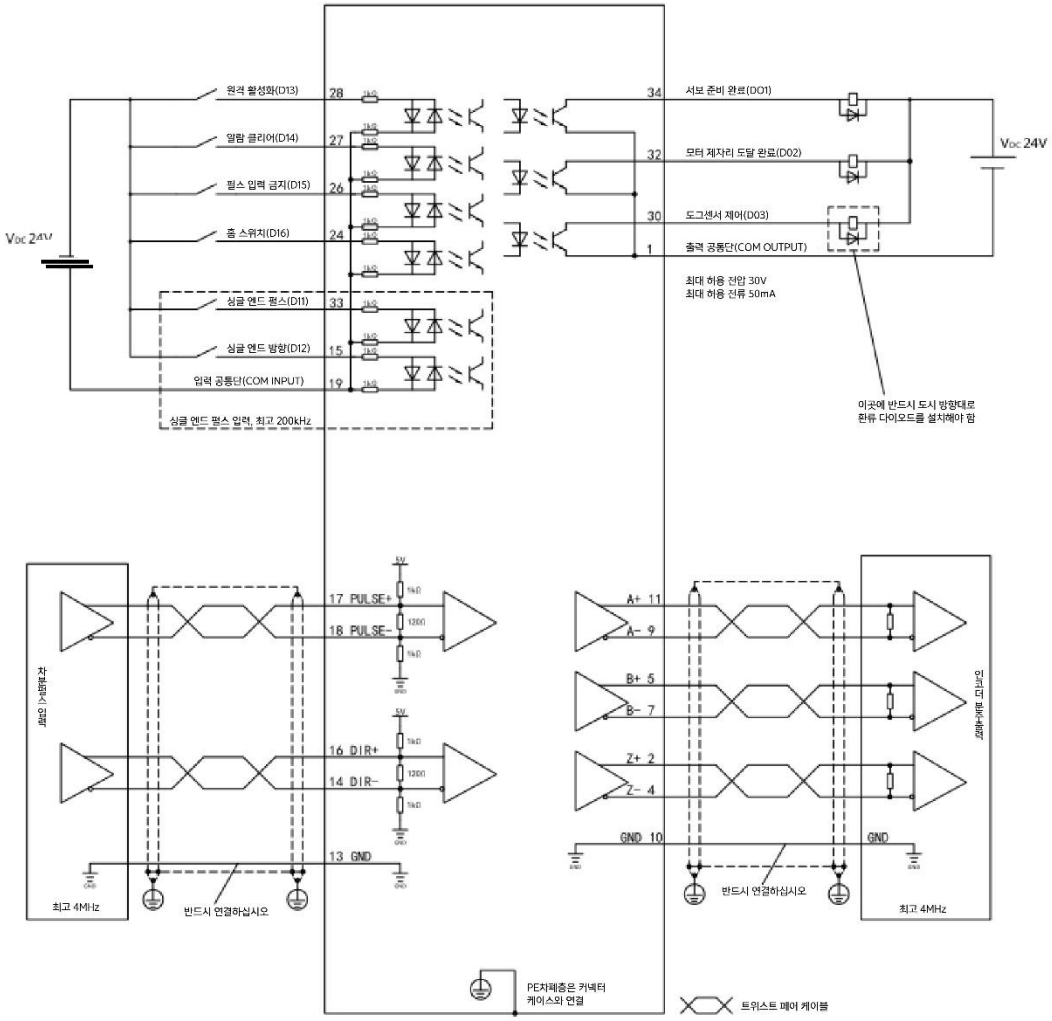
C2: I/O port SCSI 36PIN			
One	output common end	19	input common end
2	Equivalent encoder output Z+	20	485D-
3		21	485 D+
4	Equivalent encoder output Z-	22	
5	Equivalent encoder output B+	23	
6		24	Digital input 6
7	Equivalent encoder output B-	25	GND
8		26	Digital input 5
9	Equivalent encoder output A-	27	digital input 4
10	GND	28	Digital input 3
11	Equivalent encoder output A+	29	GND
12		30	Digital output 3
13	GND	31	
14	Direction signal input-	32	digital output 2
15	One touch digital input 2	33	One touch digital input 1

16	Direction signal input+	34	digital output 1
17	Pulse signal input+	35	
18	Pulse signal input-	36	

● I/O wiring diagram

! Pin 19 is connected to 24V or 0V, depending on whether the input method is sinking or sourcing.

The image below shows the wiring method for sinking input.



3. Debugging

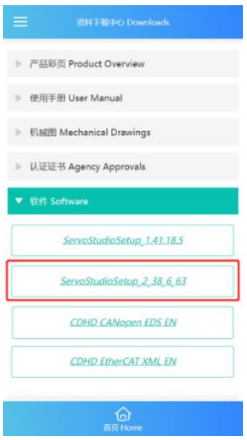
3.1 Software download and installation

● software download

Download from the manufacturer's website.

Download link:http://m.servotronix.com.cn/col.jsp?id=197

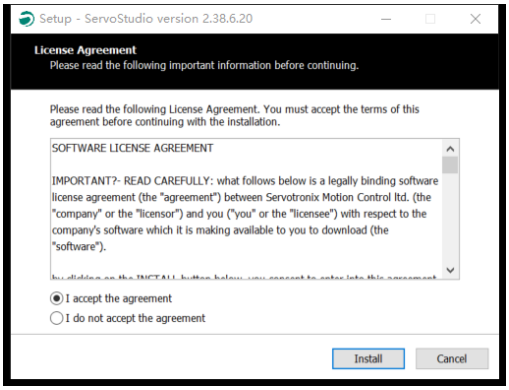
All software versions ServoStudioSetup_2_38_6_20 and higher are available.



● Software installation

ServoStudioSetup_2_38_6_20.exeDouble-click to complete the installation,

ServoStudio.exeDouble click to open the software and you are ready to use it.

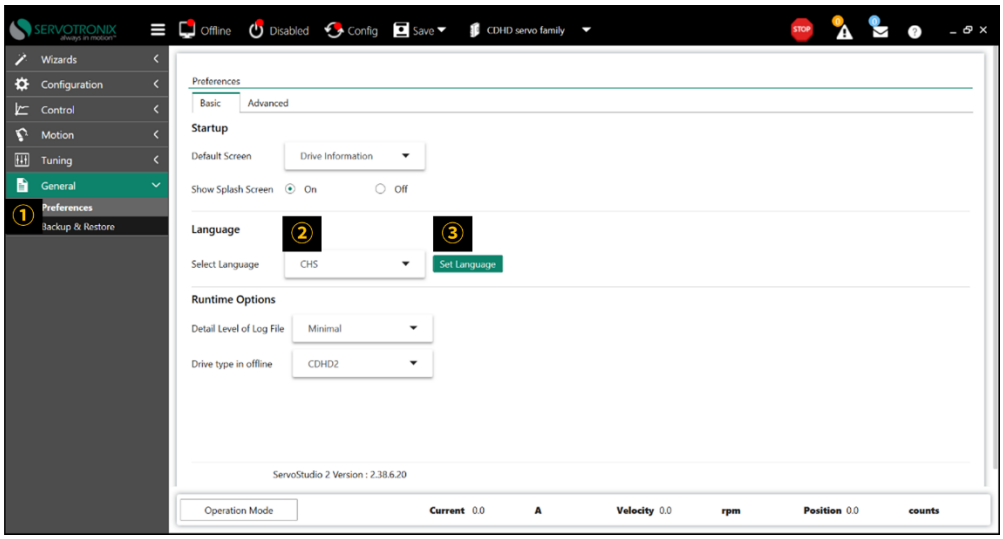


3.2 Language settings

① Click <Preferences> to change to ②<ENG> or <CHS>. If you want to change the language, select the language you want to change, and click ③<Set Language>.

If you close the program and turn it back on, it will change to the set language.

! When selecting a language, CHS represents Chinese and ENG represents English.



3.3 Communication between computer and driver

● final

① Connect the computer and the driver with a communication cable, then turn on the driver.

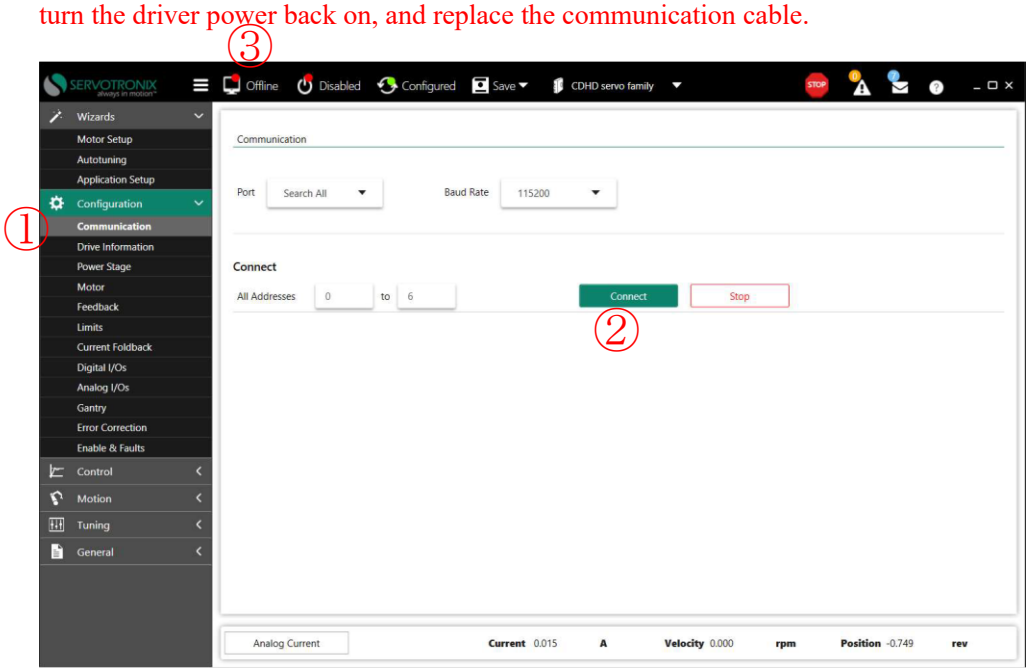
! Before turning on the power, be sure to check that all wiring is correct.

! Communication cables can be purchased from MISUMI, and the model number is USB-AM-MBM-2.

● communication

1 If communication is successful by clicking <Communication> and clicking ②<Connect>, ③<Disconnected> will appear. Online changes to .

! If communication is not possible, reconnect the communication cable, reboot the computer, turn the driver power back on, and replace the communication cable.



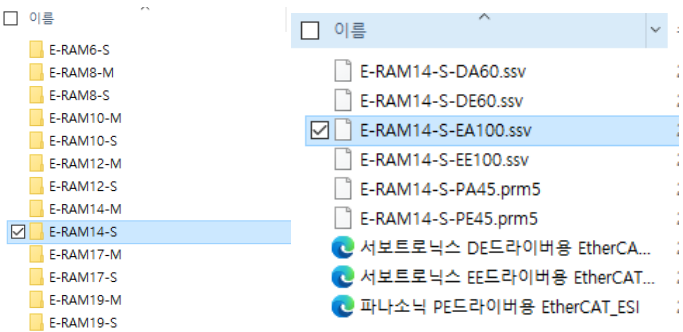
3.4Importing motor parameters

● Download parameter pack

You can download the parameter pack from the MISUMI website or request it from MISUMI customer service staff.

Select the parameter pack according to the model number of the actuator you purchased.

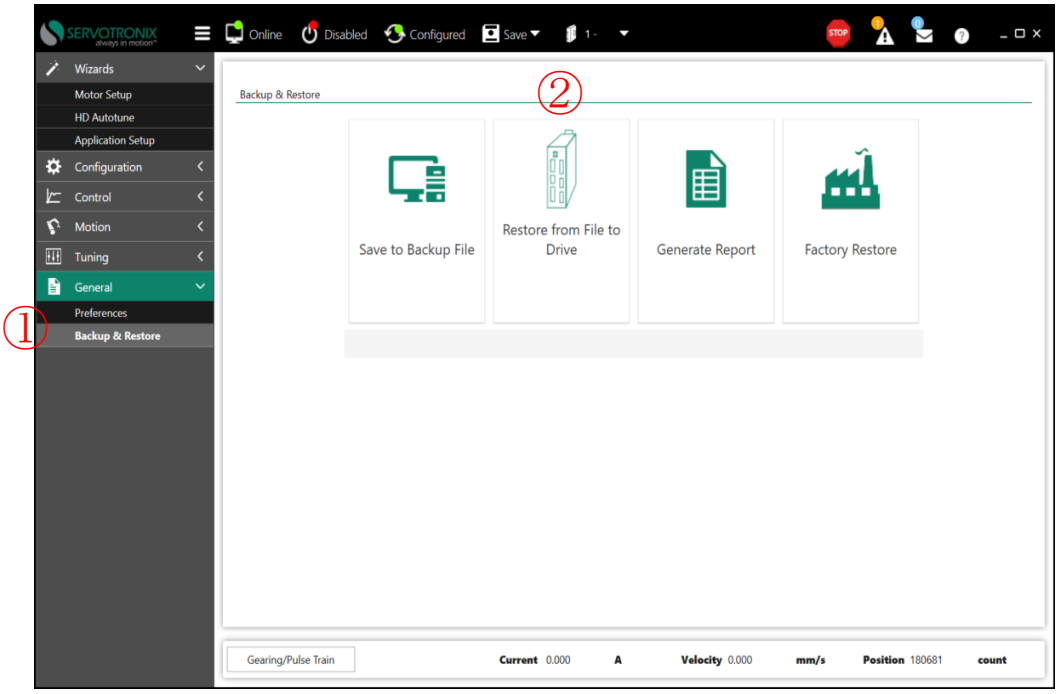
Example: If the model number of the linear motor actuator is E-RAM14-S-600-EA100-C3, the corresponding parameter pack is E-RAM14-S-EA100.



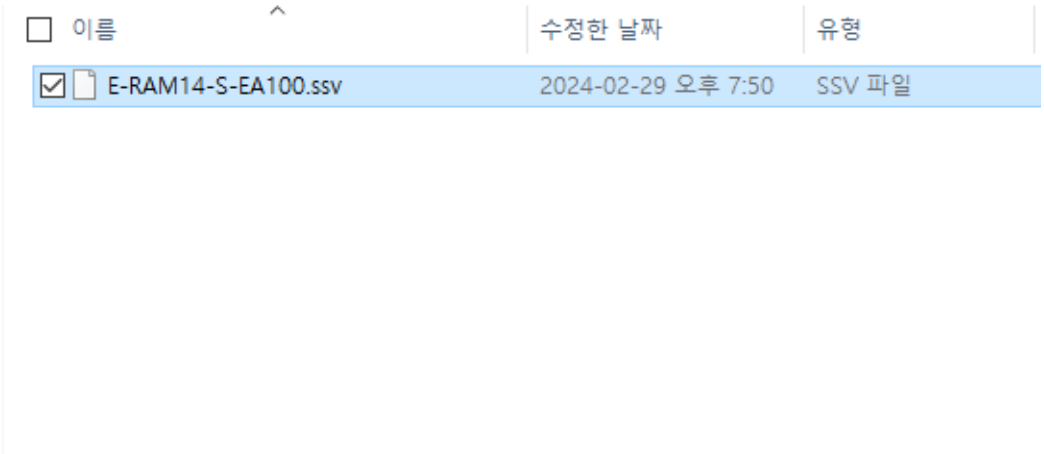
● Importing parameter packs

Operate in the following order:

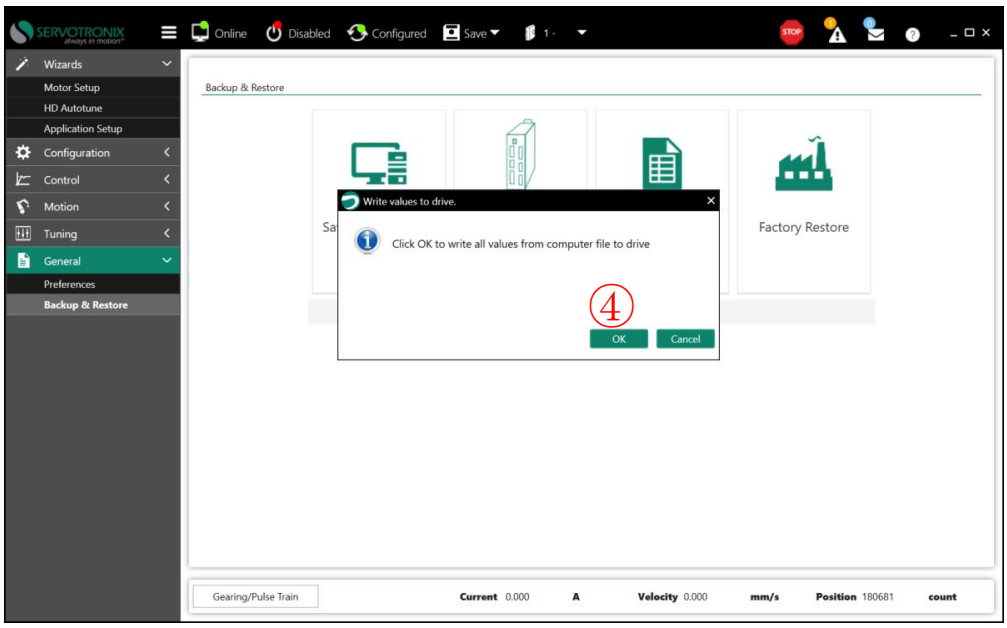
1 Click <Backup & Restore>, and click ②<Restore from File to Driver>.



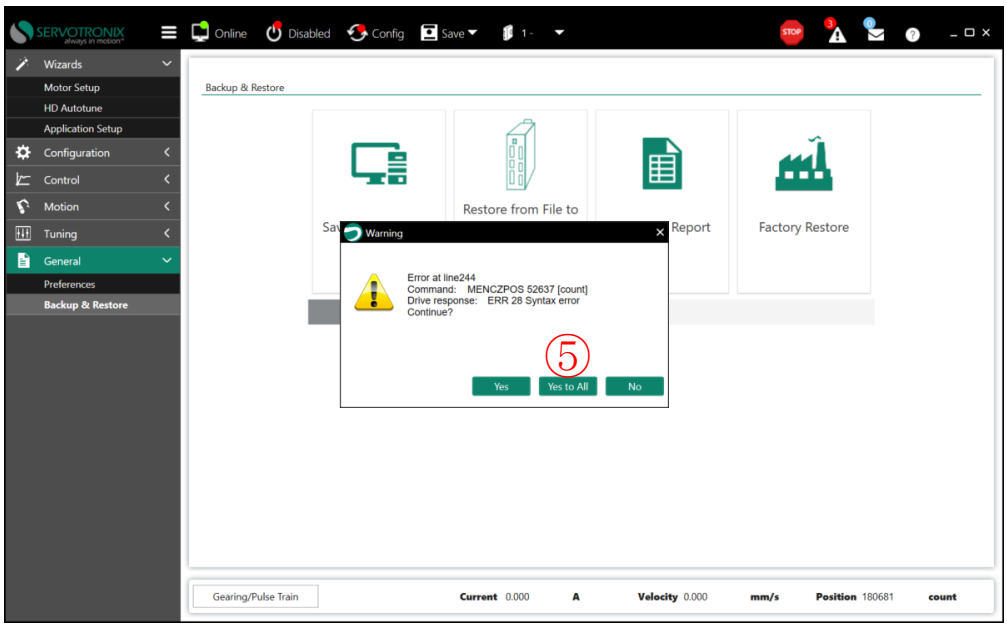
2 Double-click the locally saved parameter pack.



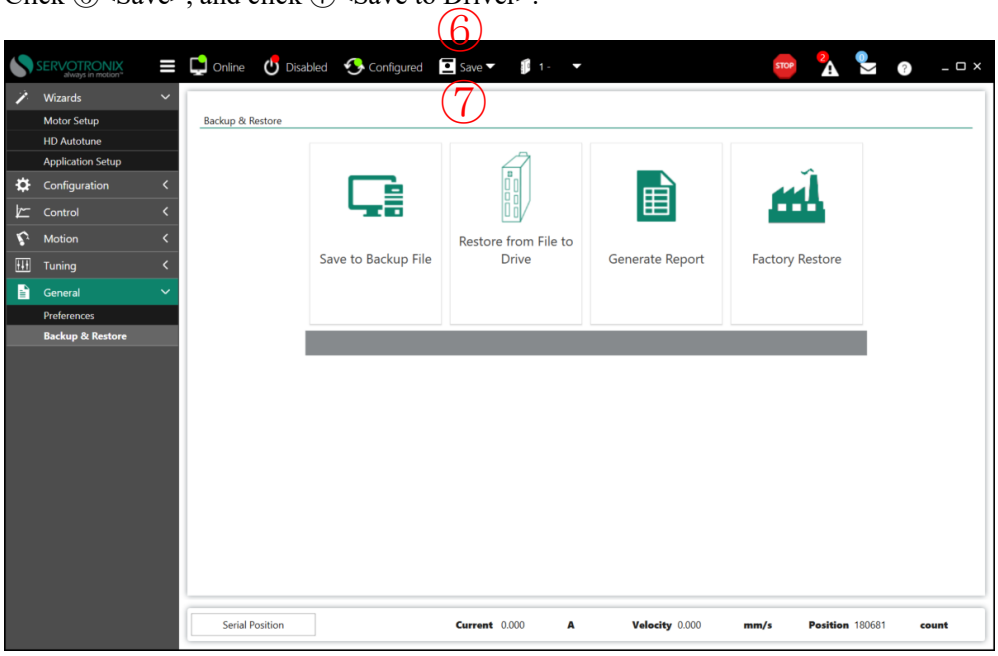
④Click <Confirm>.


Online
Disabled
Configured
Save
Wizards
Motor Setup
HD Autotune
Application Setup
Configuration
Control
Motion
Tuning
General
Preferences
Backup & Restore
Backup & Restore
Factory Restore
Write values to drive.
Click OK to write all values from computer file to drive
④
OK
Cancel
Gearing/Pulse Train
Current 0.000 A
Velocity 0.000 mm/s
Position 180681 count

⑤Click <All>.

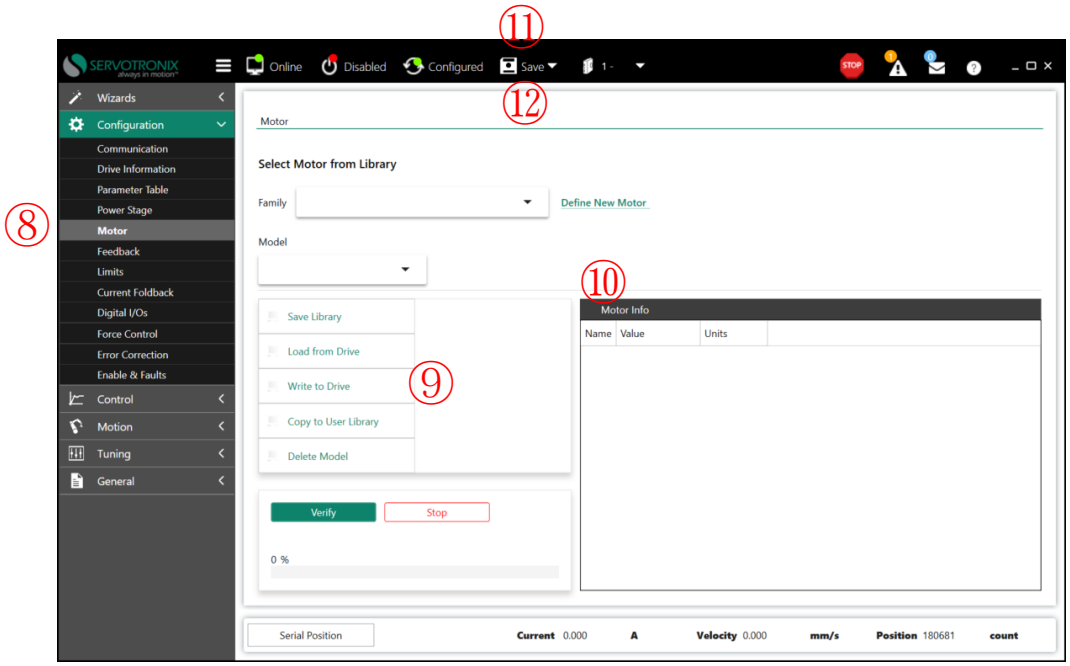

Online
Disabled
Config
Save
Wizards
Motor Setup
HD Autotune
Application Setup
Configuration
Control
Motion
Tuning
General
Preferences
Backup & Restore
Backup & Restore
Restore from File to
Report
Factory Restore
Warning
Error at line244
Command: MENCZPOS 52637 [count]
Drive response: ERR 28 Syntax error
Continue?
⑤
Yes
Yes to All
No
Gearing/Pulse Train
Current 0.000 A
Velocity 0.000 mm/s
Position 180681 count

Click ⑥<Save>, and click ⑦<Save to Driver>.



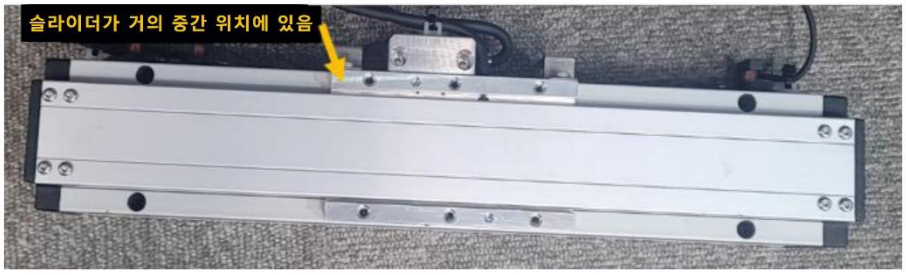
Power off the driver, wait 5 seconds, and then power it back on to allow the computer to communicate with the driver.

Click ⑧<Motor>, click ⑨<Read from Driver>, check ⑩<Motor Information> to determine whether the parameters have been imported correctly, click ⑪<Save>, and click ⑫<Save as Driver>. do.



● Motor Phase Finding

First, turn off the driver and push the slider on the actuator to the middle position. Then turn it on to allow the driver to communicate with your computer.



1 Click <Terminal>, enter motorsetup 1 in ② and press the Enter key.

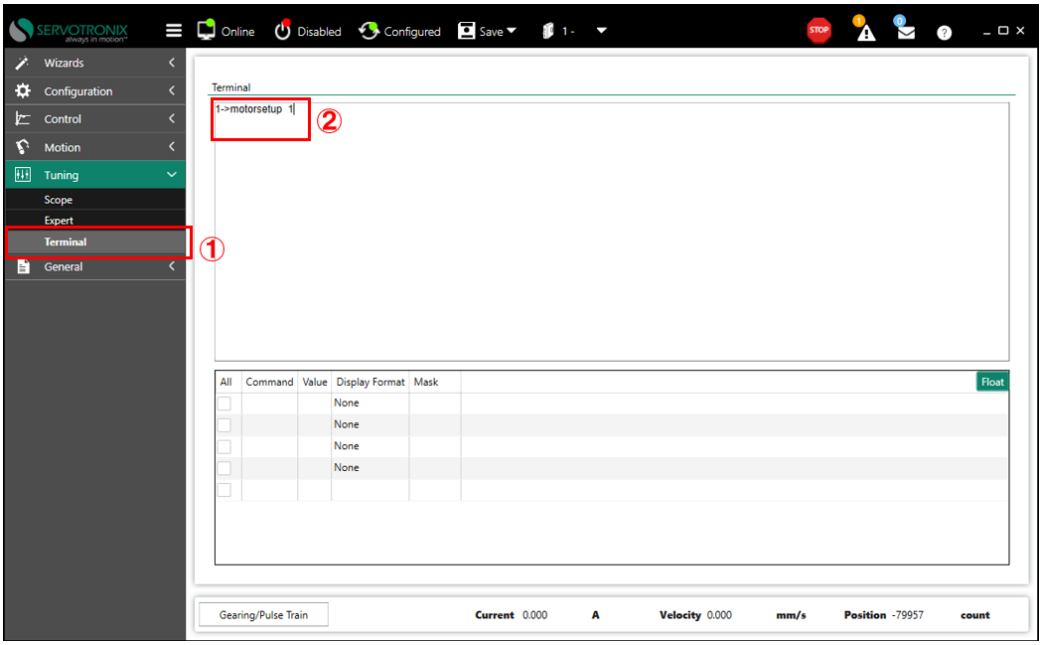
At this time, the driver is activated (Disabled go Enabled), the slider will slowly move back and forth about 20 mm, and the activation will automatically break after success.

! Type motorsetup, press the space bar, and then type 1.

! If the slider does not move, check the following:

1) Check whether external activation is set for I/O.

2) Whether the driver has any other alarms



3.5 Commissioning

● Preliminaries

Click ①<Scope> and set ② to <Serial Position>,

③Set <Position>, <Velocity>, <Acc>, and <Dec>,

④Change the name in <Trigger Setup> to <V>, ⑤Change <Level> to <10>, ⑥Change <Pre-Points> to <10>.

⑦Select the variables to record in <Record Variables>.

! Confirm that the interface mode is <Serial/Pulse>, and refer to 3.6 for instructions.

! Position unit: 1counts=1μm Example) To move 10mm, enter 10000 counts.

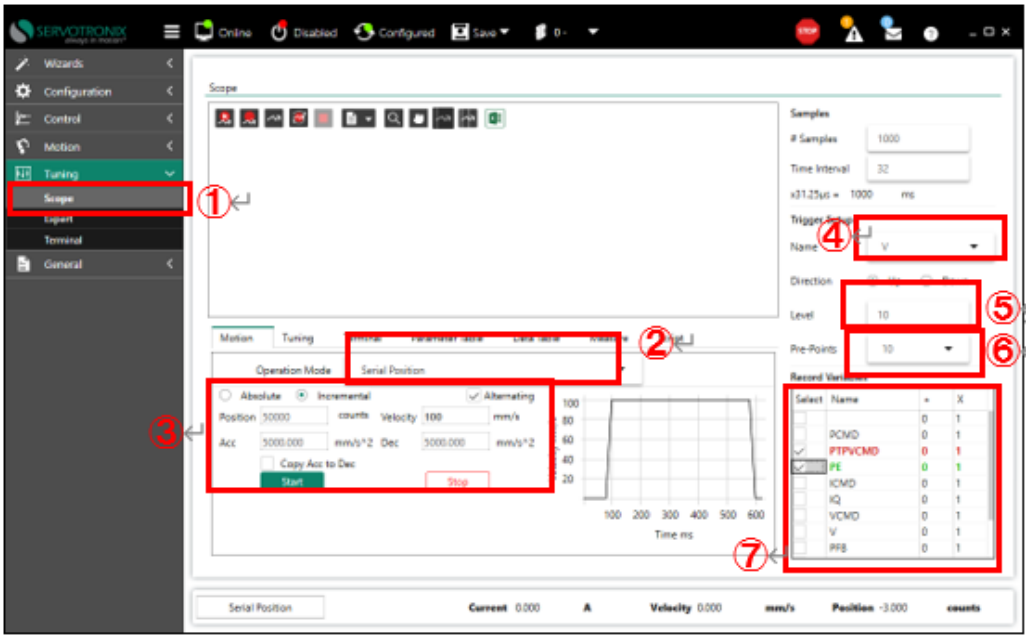
! Common variables include:

PTPVCMD position command speed

PE position error

ICMD current command

V actual speed



● Waveform acquisition

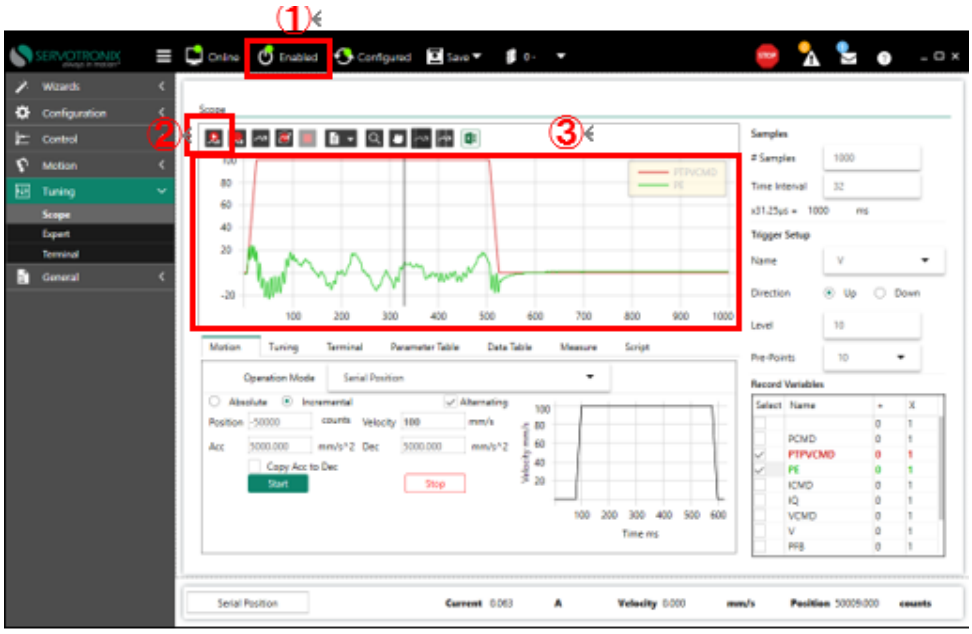
1

When you click , the button changes to <Start> and then the driver is activated.

② When you click , the actuator starts operating, and when operation is completed, ③<Waveform display> is displayed.

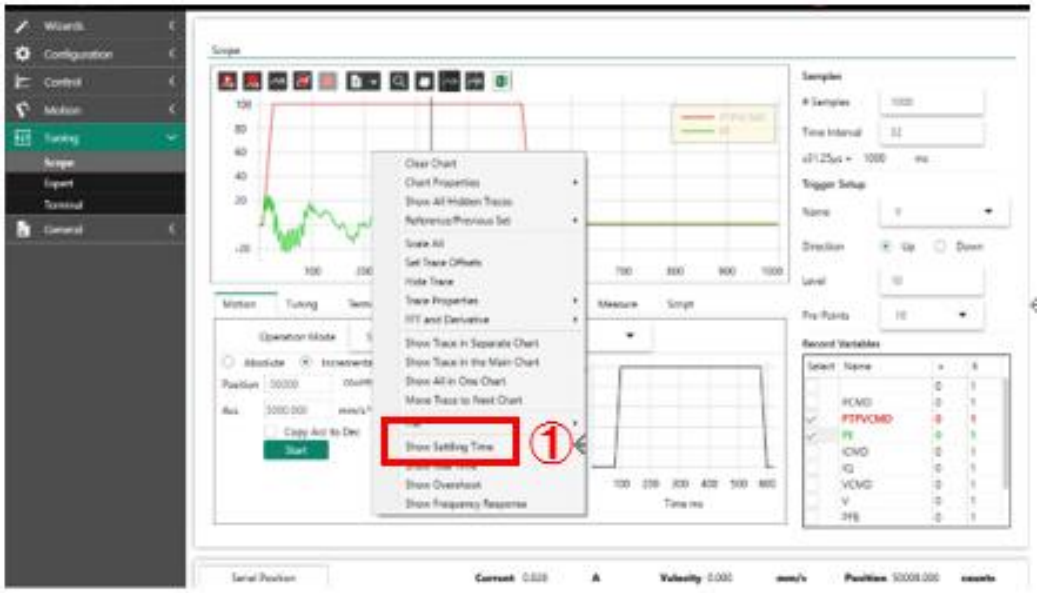
! It is normal for the actuator to emit an electromagnetic sound after activation.

! When you are finished driving, be sure to turn it off for safety reasons.



● Settling Time Analysis

Place the mouse at a random location on the oscillogram, right-click, and select ①<Show Settling Time>.



① Set <PVPVCMD> in <Command>, and select <PE> in ②<Response>.

③Set the position accuracy error (unit μm) in <Acceptable Range>, and click ④<Show>.

⑤The required settling time is displayed in <Setting Time>.

Example) If Acceptable Range is set to 5 and Setting Time is displayed as 95, it indicates that the position accuracy error is within 5μm and the required settling time is 0.095 seconds.

● Gain Tuning

Adjust parameters according to the waveform to get the actuator in optimal condition.

! Debugging tips:

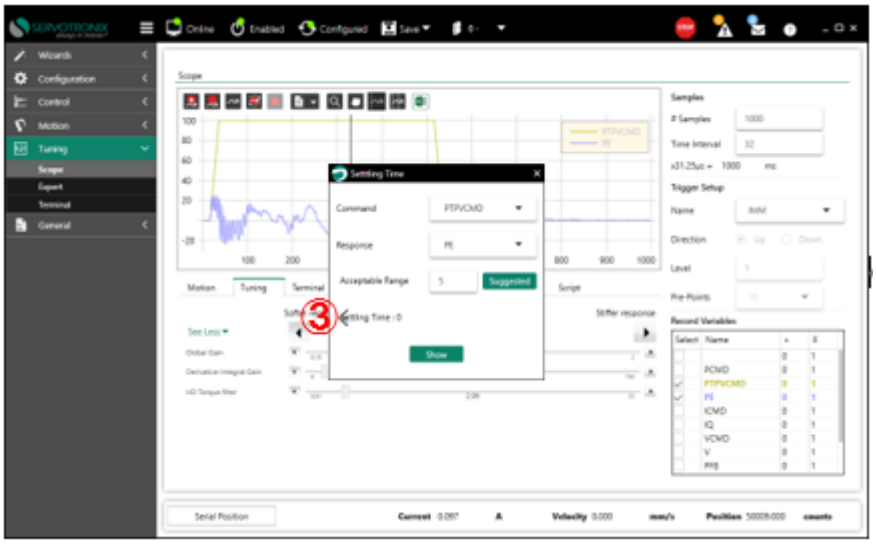
By adjusting the rigidity level, you can increase the responsiveness of the actuator or suppress module vibration and noise.

1 Click <Tuning> to set ②<Gain Level>.

● Check debugging results

After collecting the waveform again, the settling time is analyzed.

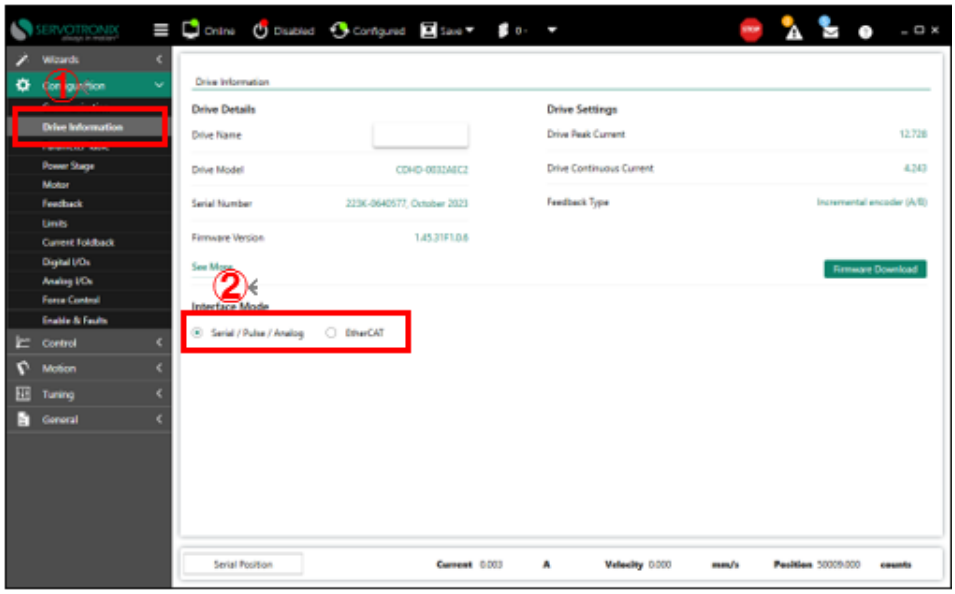
Example) After increasing the rigidity level from 26 to 29, the position accuracy error is within 5 μm, and the required correction time has been changed from 0.095 seconds to 0 seconds.



3.6 Control

● mode select

1　Click <Drive Information> and select ②<Interface Mode> as <Serial/Pulse>.

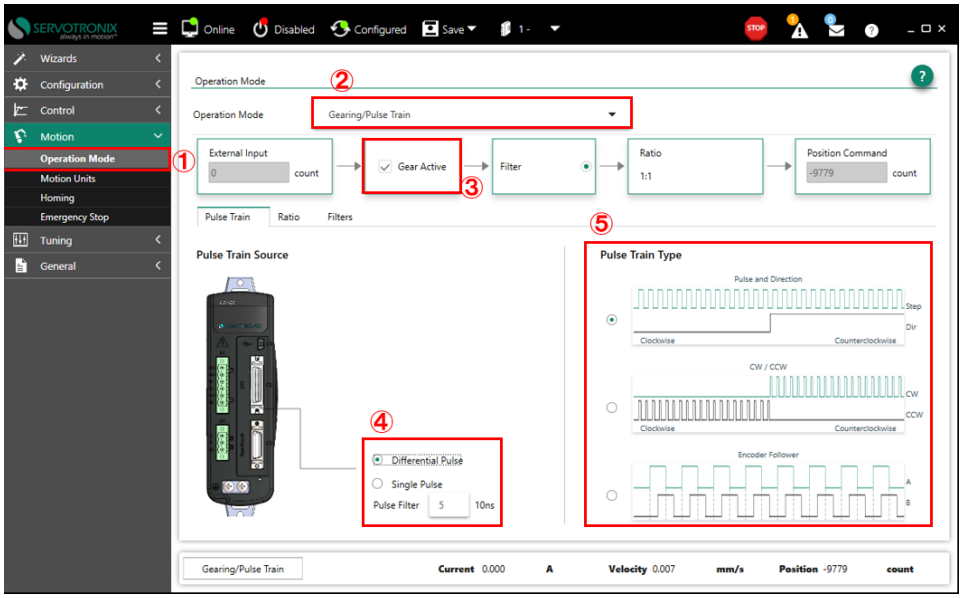


● **Pulse mode settings**

Click ①<Work Mode>, select ②<Electrical Device/Pulse Train>, and check ③<Electrical Enabled>.

Select ④<Pulse Train Source> (differential pulse or single-ended pulse) according to the host computer,

⑤Select <Pulse Train Type>.

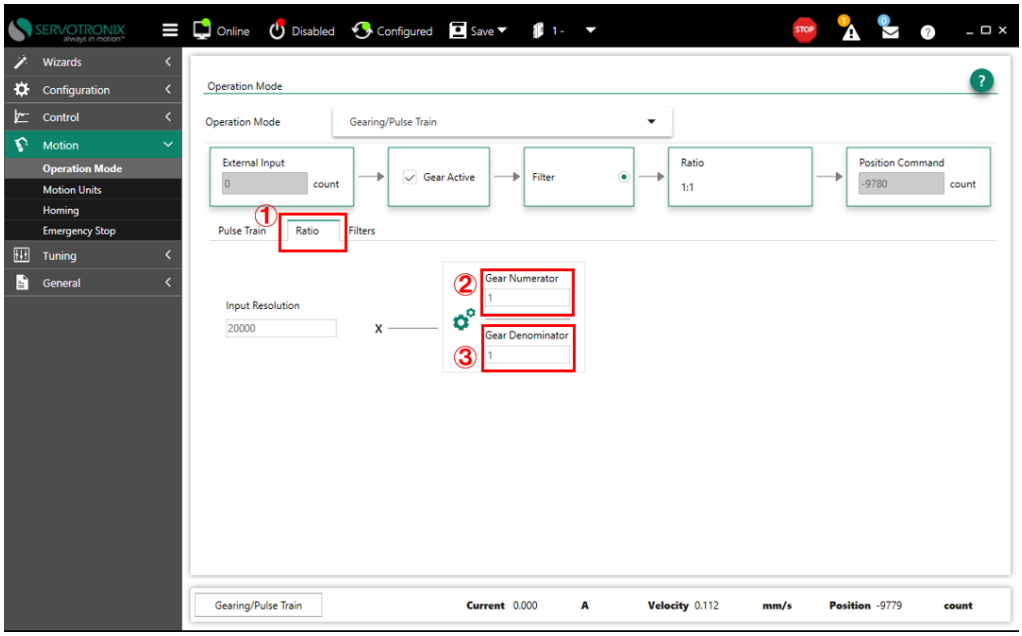


● Electronic gear ratio settings

1 Click <Motion>, and set ②<Feed Constant Scaling Numerator>.

Formula: Actual traveling distance = Command pulse x (electronic gear numerator/electronic gear denominator) x 0.001mm

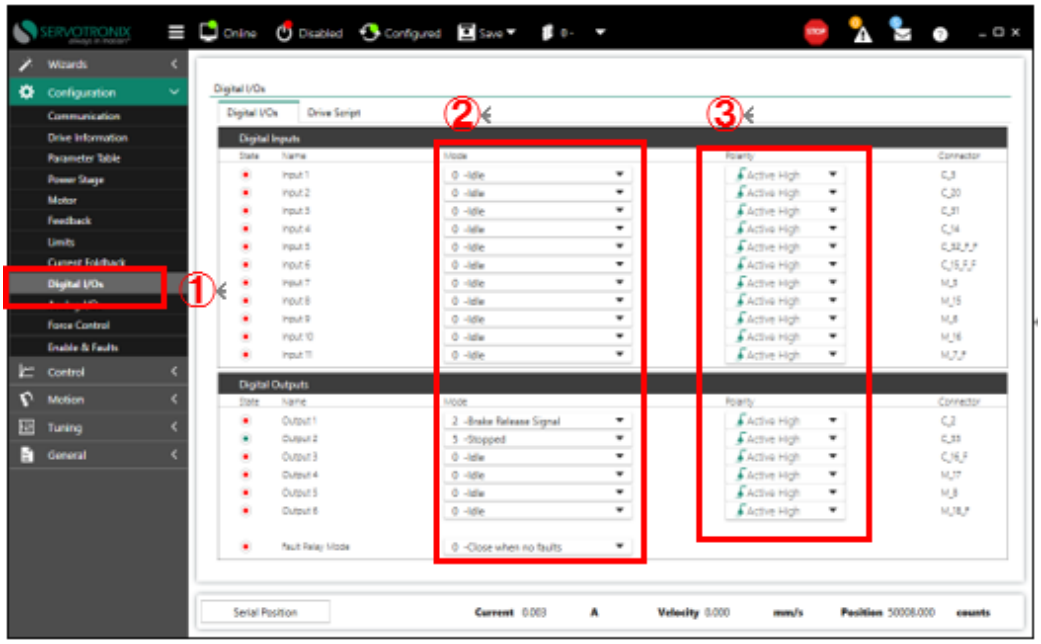
! Be sure to press the Enter key after setting the parameters.



● I/O settings

Click ①<Digital I/O>, set ②<Mode>, and set ③<Polarity>.

! The <high level valid> polarity is NPN mode.



● Change of driving direction

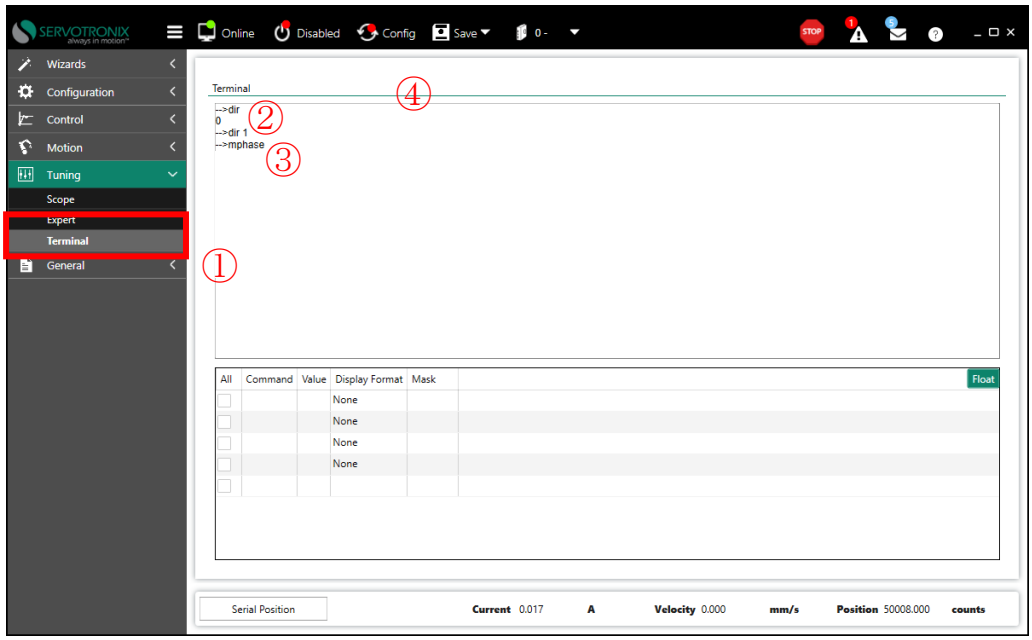
① Click <Tuning>, enter dir in ②<Terminal>, then press Enter to check ③<Result>.

③If <Result> is 0, enter dir 3 in ②<Termianl>.

③If <Result> is 3, enter dir 0 in ②<Termianl>.

④Click <Config>.

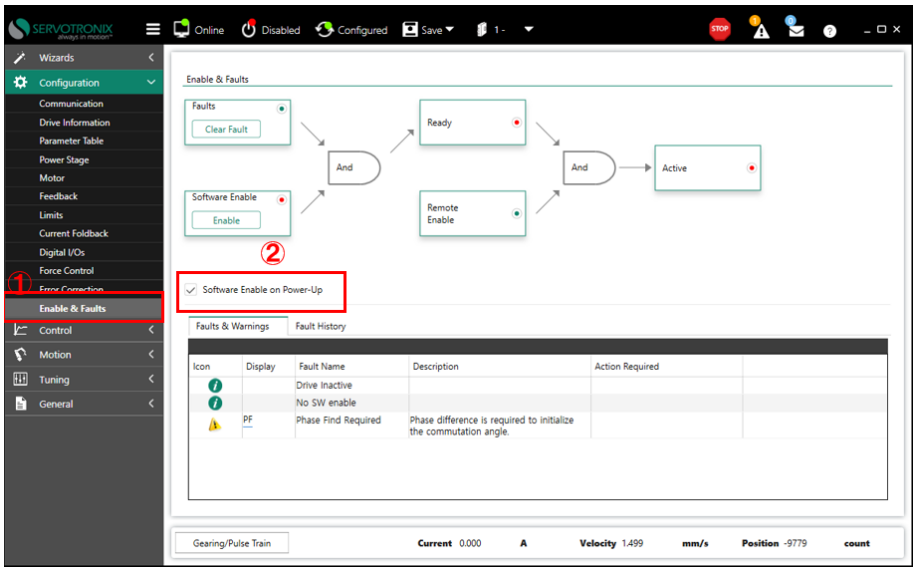
! Type dir, followed by a space, then 3 or 0. Otherwise, an error will occur.



● Power-on activation settings

①Click <Activation and Troubleshooting> and check ②<Automatically Activate after Power On>.

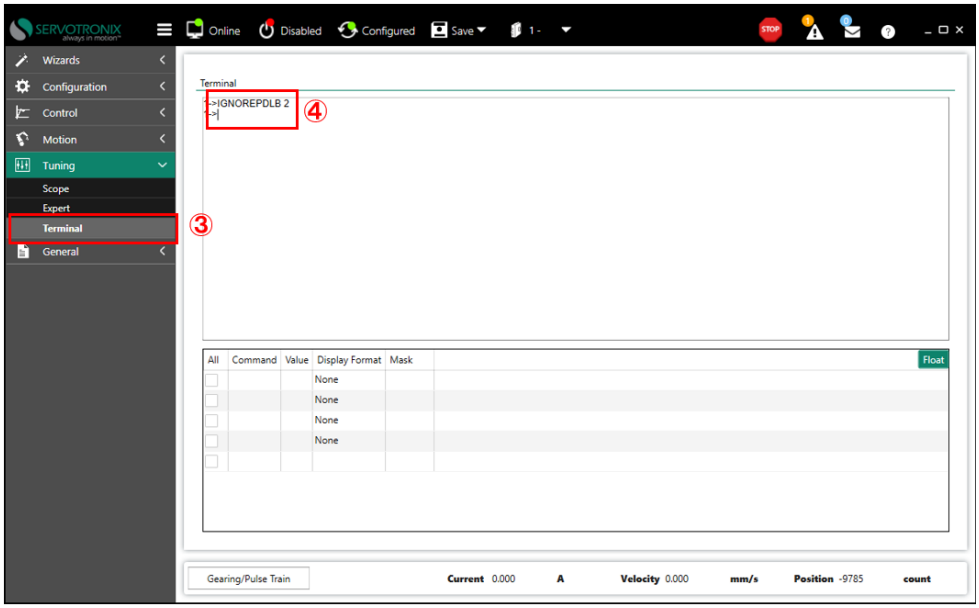
! If you do not control the driver's operation with a higher-level computer, remove <Automatic activation after power on> and set <Remote activation> in ②<Mode> in <Digital I/O> to Idle. Otherwise it cannot be activated.



! When in differential pulse mode, the driver checks the level status of the differential pulse, and when the pulse line is not connected, the driver sounds the R25 alarm. The operation method to block the alarm is as follows.

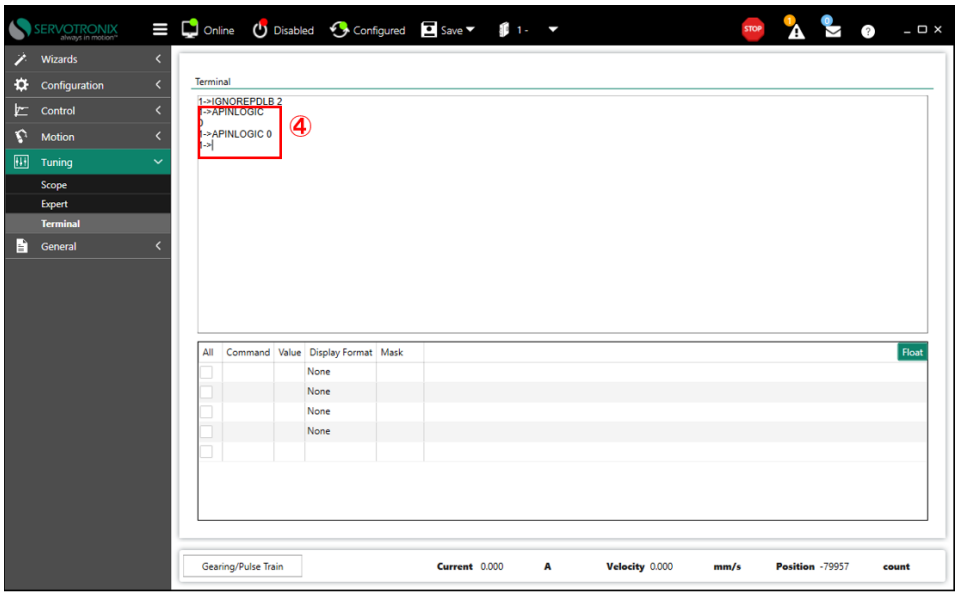
③ Click <Terminal>,

3 Enter IGNOREPDLB 2 and press Enter.



! When the pulse train type is CW/CCW pulse mode, the driver's inability to receive pulses can be resolved as follows:

Enter APINLOGIC 0 (or 1) in ④ and press the Enter key.

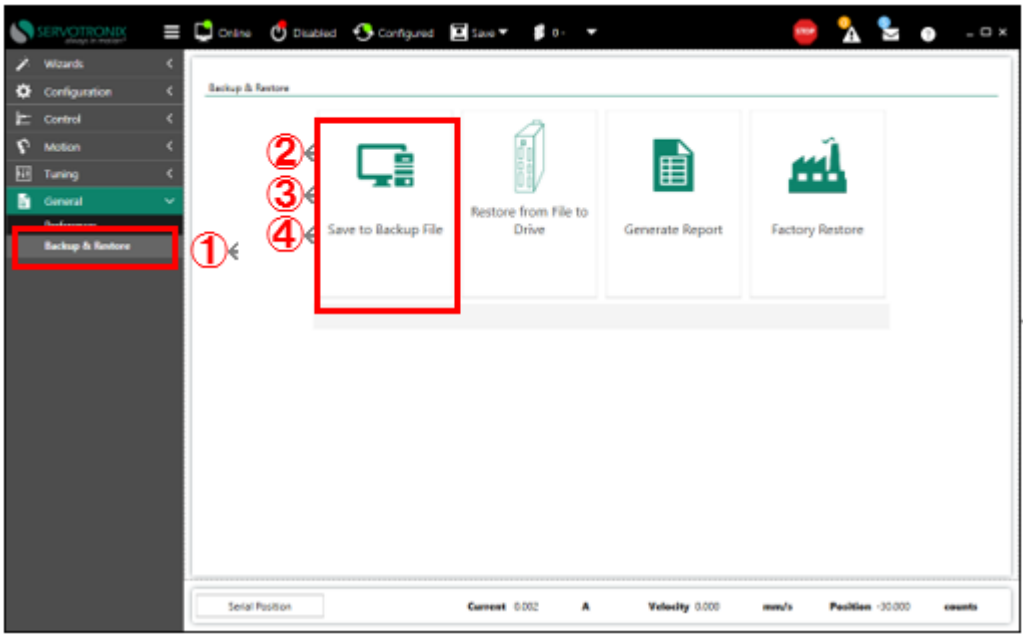


3.7 Parameter backup & parameter recovery

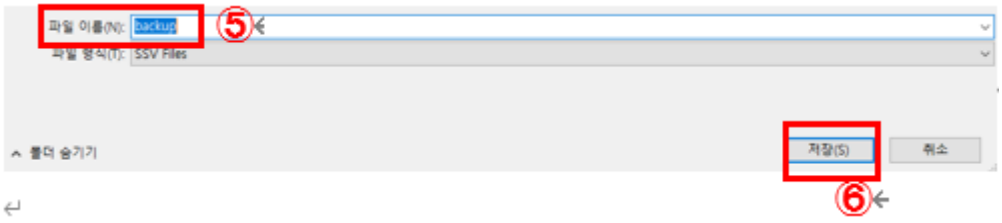
● Parameter backup

Click ①<Backup & Recovery>, click ②<Save>, then click ③<Save to Driver>,

④Click <Save to backup file>.



Enter the file name in ⑤ and click ⑥<Save>.



● Parameter recovery

For recovery method, please refer to <3.4 Importing Motor Parameters>.

The differences are as follows:

1. The parameter pack changes to the saved parameter pack.

2. No need to do motor phase search.