

# **MiSUMi**

## **Linear Motor Actuator**

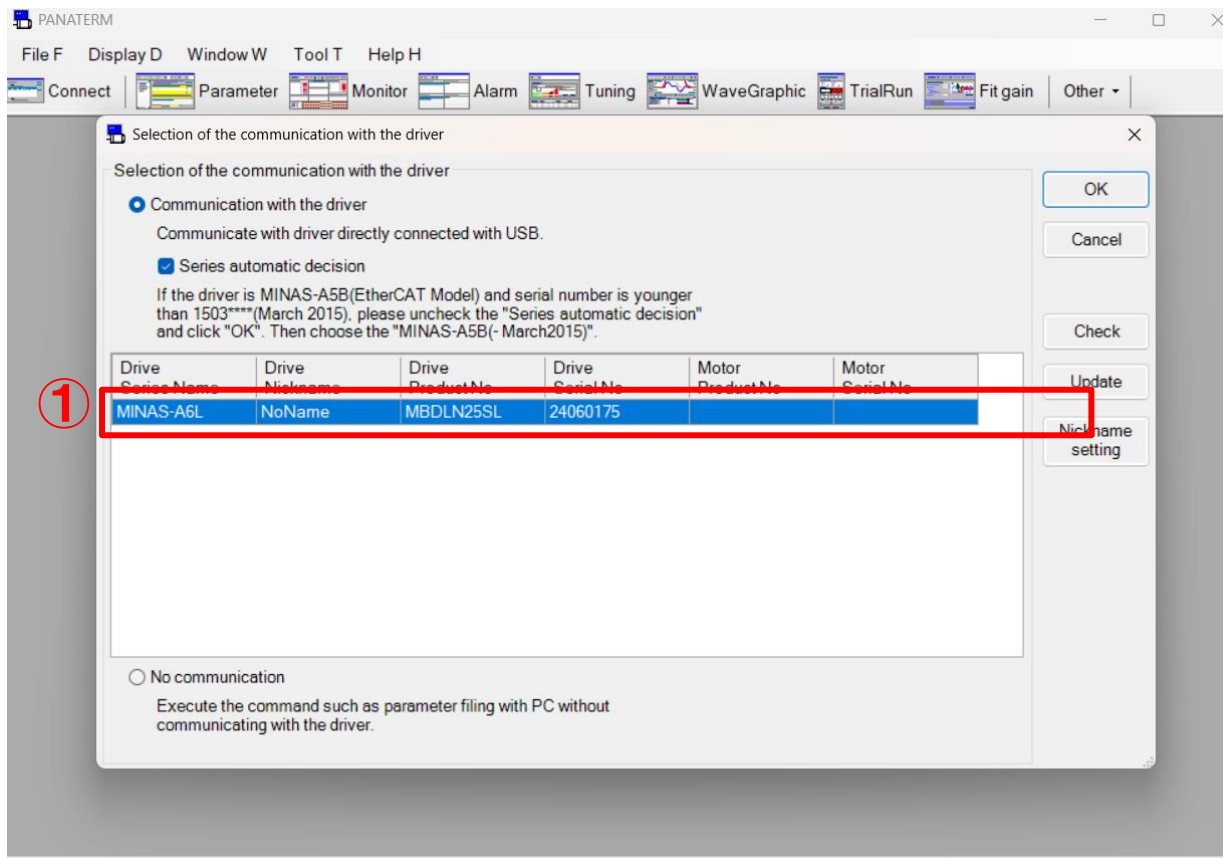
### **Panasonic Auto tuning manual**

Rev.1

**2024-12-21**  
**Technical support team**

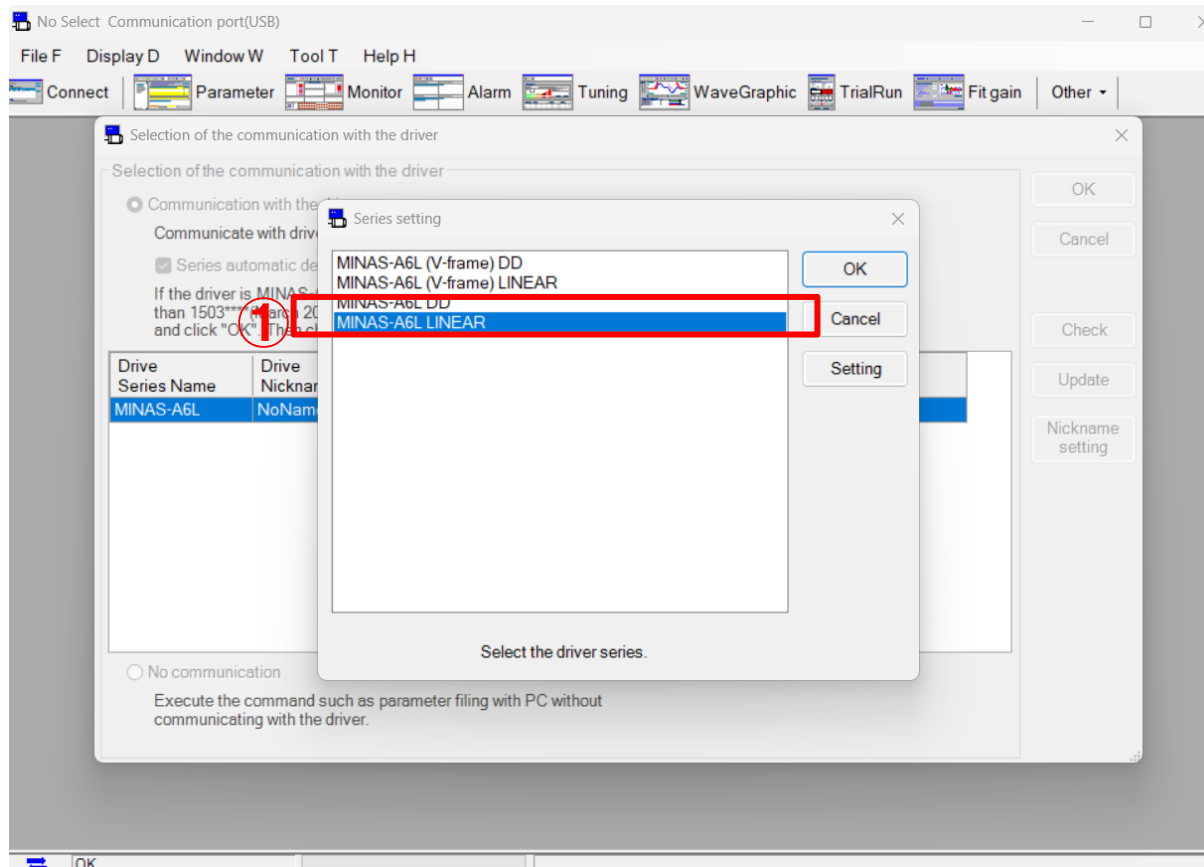
# Drive access

- Turn on the drive, connect with USB, and run PANATERM.
- ① When the drive are shown, click “OK”.



# Drive access

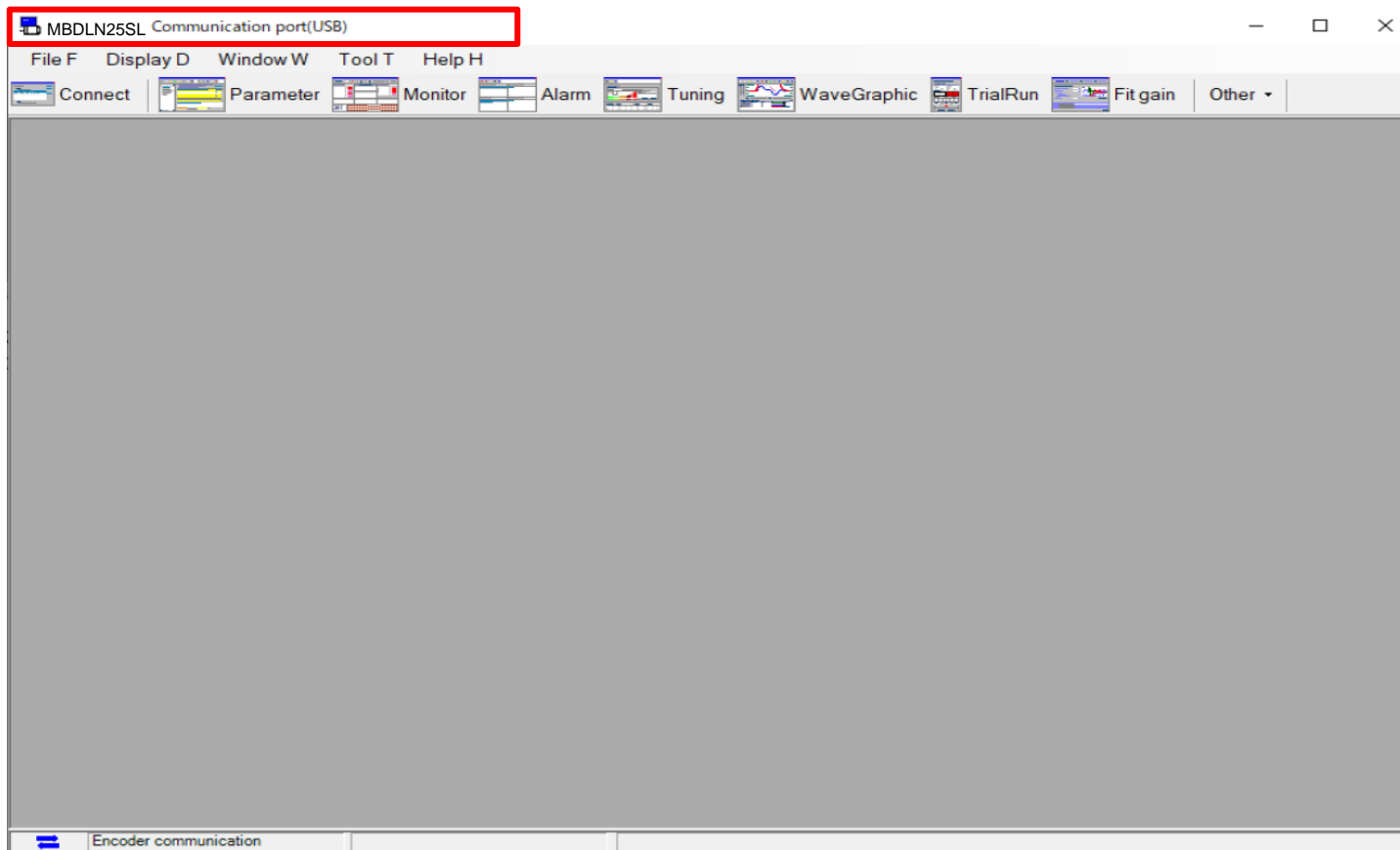
- When a pop-up window appears as shown in the screen, select MINAS-A6L LINEAR as shown in ① and click “OK”.



# Drive access

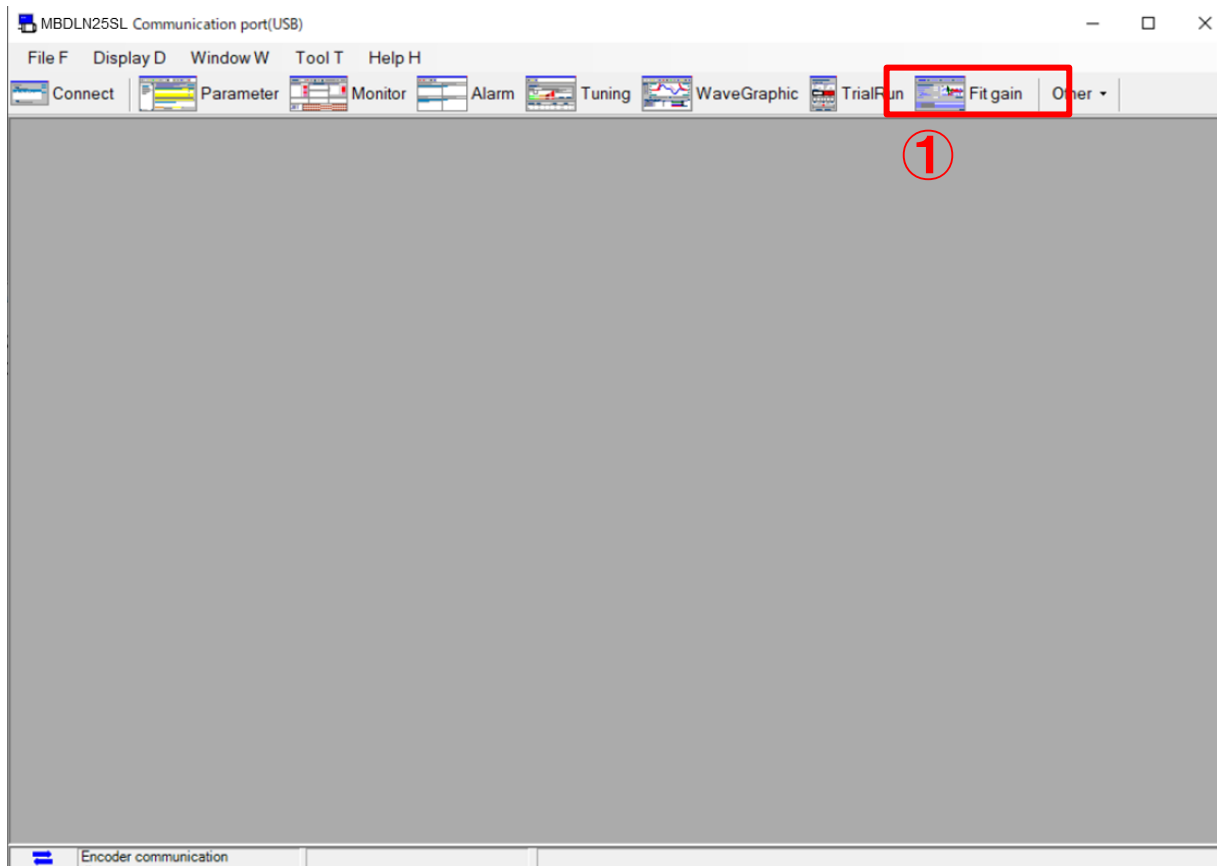
- If communication is normal, the drive type MBDLN25SL is displayed in ①.
- If communication is not possible, reboot the drive and reconnect as done above.

①



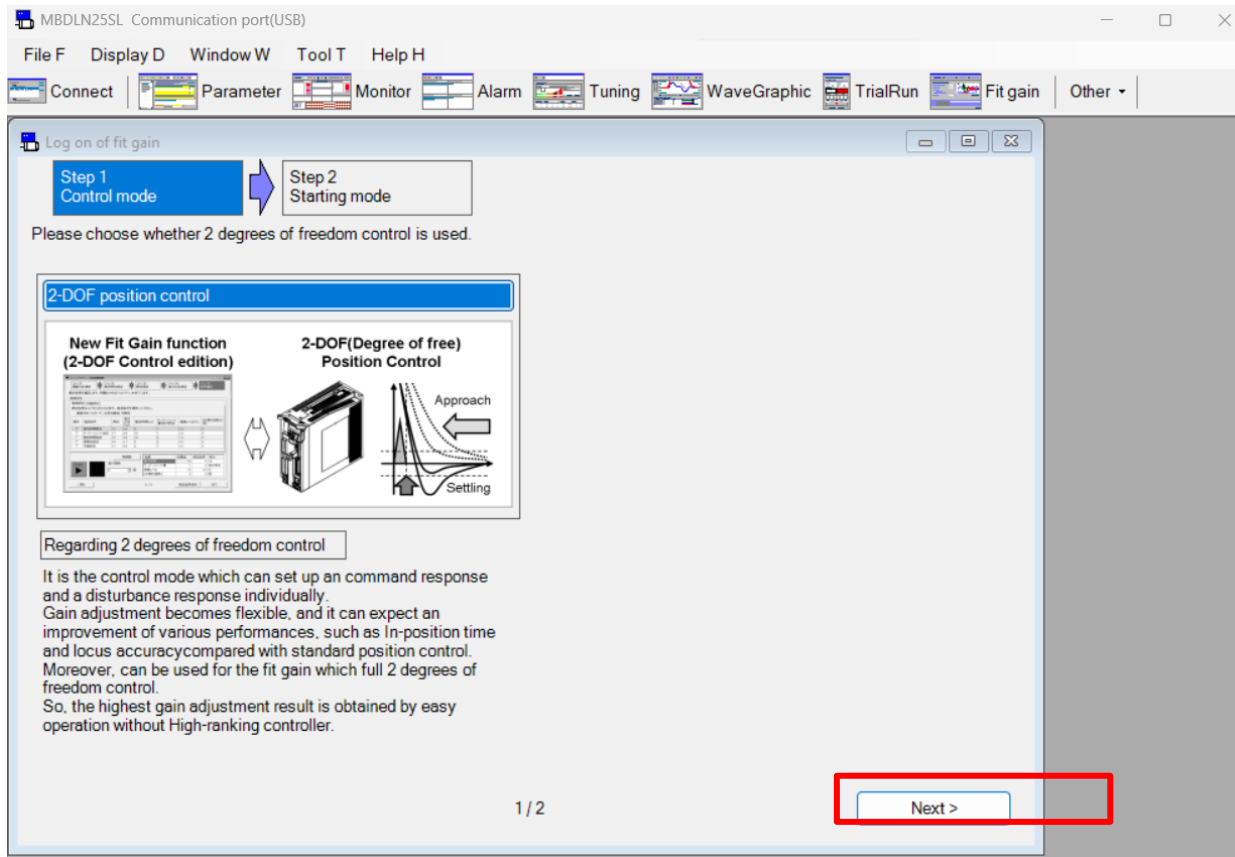
# Drive access

- ① Click Fit gain



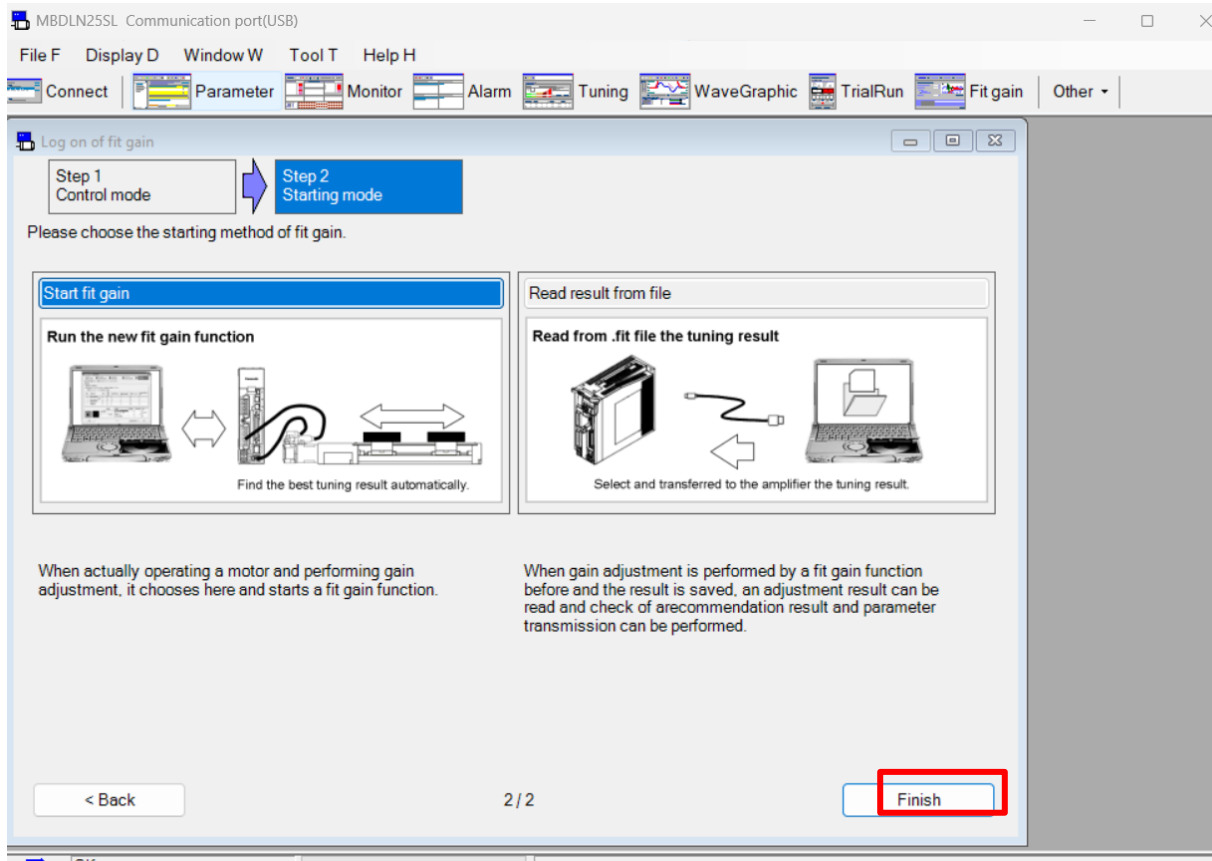
# Auto tuning

- Window show you are log on, click “next” change to next step



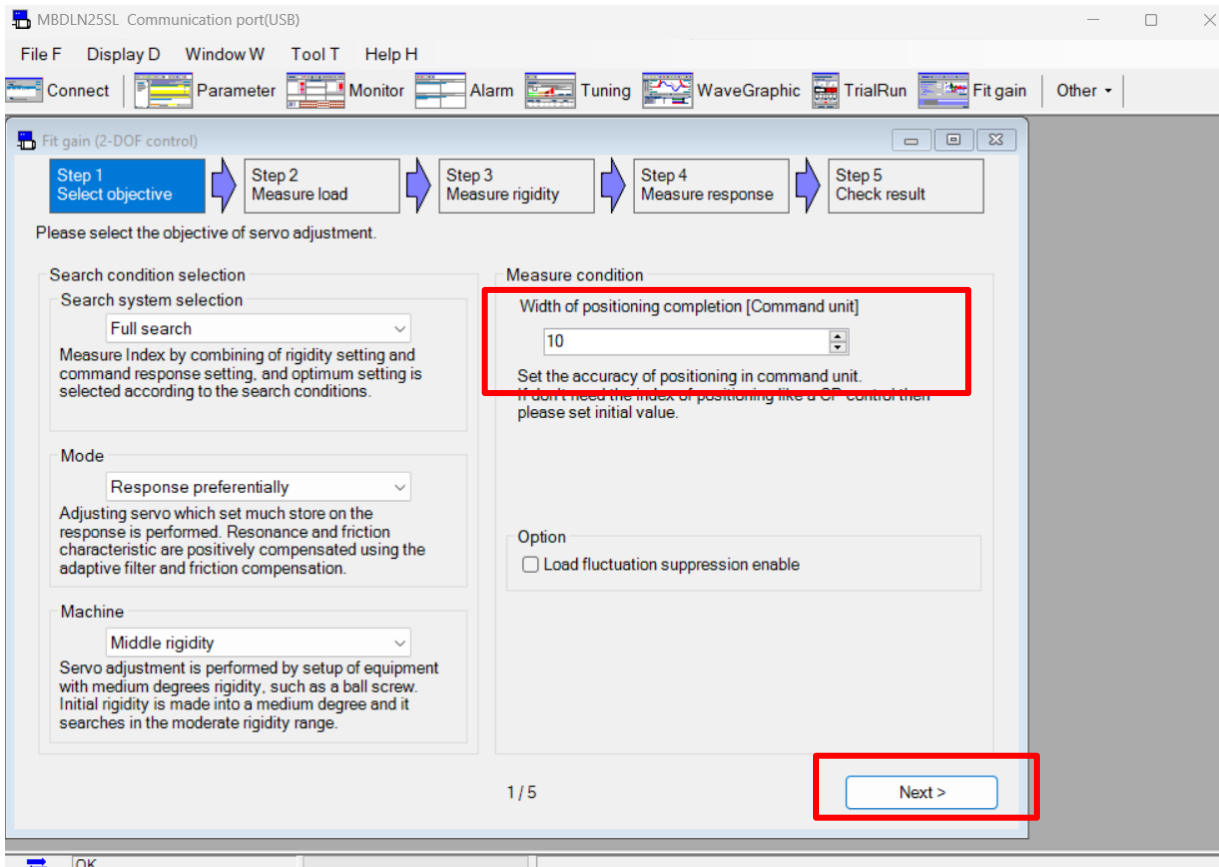
# Auto tuning

- Start fit gain mean you are going to run fit gain function
- Read result from file mean you are going to read tuning parameter from a file
- Click “Finish” to confirm



# Auto tuning

- Chose width of positioning completion you want
- Smaller value, high precision you require (recomment 10)
- After that, Click “Next”



MBDLN25SL Communication port(USB)

File F Display D Window W Tool T Help H

Connect Parameter Monitor Alarm Tuning WaveGraphic TrialRun Fit gain Other ▾

Fit gain (2-DOF control)

Step 1 Select objective Step 2 Measure load Step 3 Measure rigidity Step 4 Measure response Step 5 Check result

Please select the objective of servo adjustment.

Search condition selection

Search system selection

Full search

Measure Index by combining of rigidity setting and command response setting, and optimum setting is selected according to the search conditions.

Mode

Response preferentially

Adjusting servo which set much store on the response is performed. Resonance and friction characteristic are positively compensated using the adaptive filter and friction compensation.

Machine

Middle rigidity

Servo adjustment is performed by setup of equipment with medium degrees rigidity, such as a ball screw. Initial rigidity is made into a medium degree and it searches in the moderate rigidity range.

Measure condition

Width of positioning completion [Command unit]

10

Set the accuracy of positioning in command unit.  
If don't need the index of positioning like a GP control then please set initial value.

Option

☐ Load fluctuation suppression enable

1 / 5

Next >

# Auto tuning

- SRV ON to active axis

MBDLN25SL Communication port(USB)

File F Display D Window W Tool T Help H

Connect Parameter Monitor Alarm Tuning WaveGraphic TrialRun Fit gain Other ▾

### Fit gain (2-DOF control)

Step 1 Select objective → **Step 2 Measure load** → Step 3 Measure rigidity → Step 4 Measure response → Step 5 Check result

Measure the load character. Please click a right side start button after a working range set the left side.

**Operation area setting**  
Movement range is set up.  
Instruction pattern change of Step 4 also put restrictions on Working range specified here.  
So, please specify Working range widely.

JOG Speed: 50 mm/s  
JOG Acc./Dec. time: 50 ms

**SRV ON** | **SRV OFF**

MAX (pulse): 0 | MOTOR (pulse): 0 | MIN (pulse): 0

**Load characteristic measurement**  
Measure load is started. Please specify Direction, Movement, and Trial frequency, and push a start button.

Direction: Reciprocate (Positive) ▾ Movement: Operation area ▾ Trial frequency: 4 ▾

**START** **RESET** **SRV OFF**

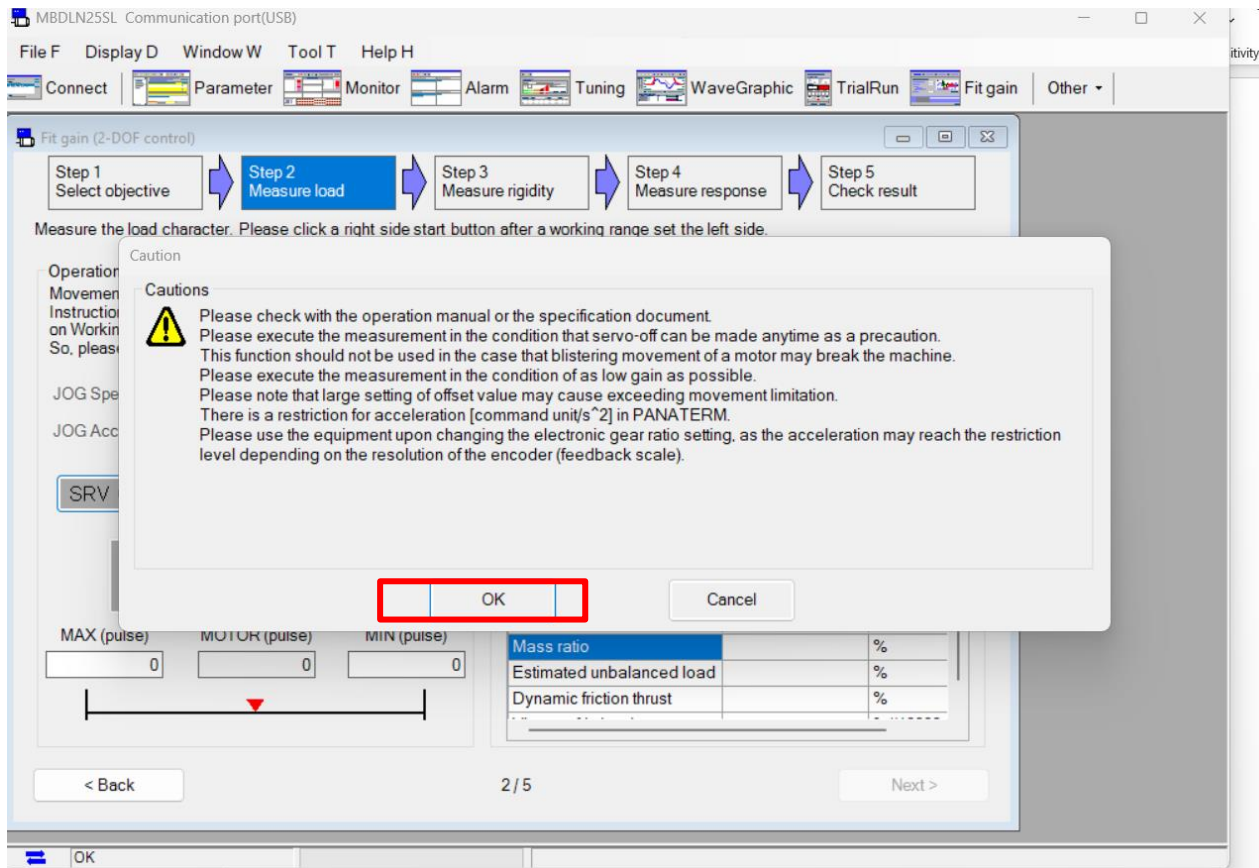
Acceleration: 1000 [mm/s<sup>2</sup>]  
Thrust command (MAX): - [%]

Load Characteristics	Measurement result	Unit
Mass ratio		%
Estimated unbalanced load		%
Dynamic friction thrust		%

< Back 2/5 Next >

# Auto tuning

- A precaution pop up, click OK to confirm



# Auto tuning

- ① Jog positive to apply positive operation area
- ② Jog negative to apply negative operation area
- ③ Click Start to measure mass ratio

MBDLN25SL Communication port(USB)

File F Display D Window W Tool T Help H

Connect Parameter Monitor Alarm Tuning WaveGraphic TrialRun Fit gain Other ▾

Fit gain (2-DOF control)

Step 1 Select objective → Step 2 Measure load → Step 3 Measure rigidity → Step 4 Measure response → Step 5 Check result

Measure the load character. Please click a right side start button after a working range set the left side.

Operation area setting  
Movement range is set up.  
Instruction pattern change of Step 4 also put restrictions on Working range specified here.  
So, please specify Working range widely.

JOG Speed 50 mm/s  
JOG Acc./Dec. time 50 ms

SRV ON SRV OFF

① MAX (pulse) 0 MOTOR (pulse) 0 MIN (pulse) 0

②

Load characteristic measurement  
Measure load is started. Please specify Direction, Movement, and Trial frequency, and push a start button.

Direction Reciprocate (Positive) Movement Operation area Trial frequency 4

START ③ RESET SRV OFF

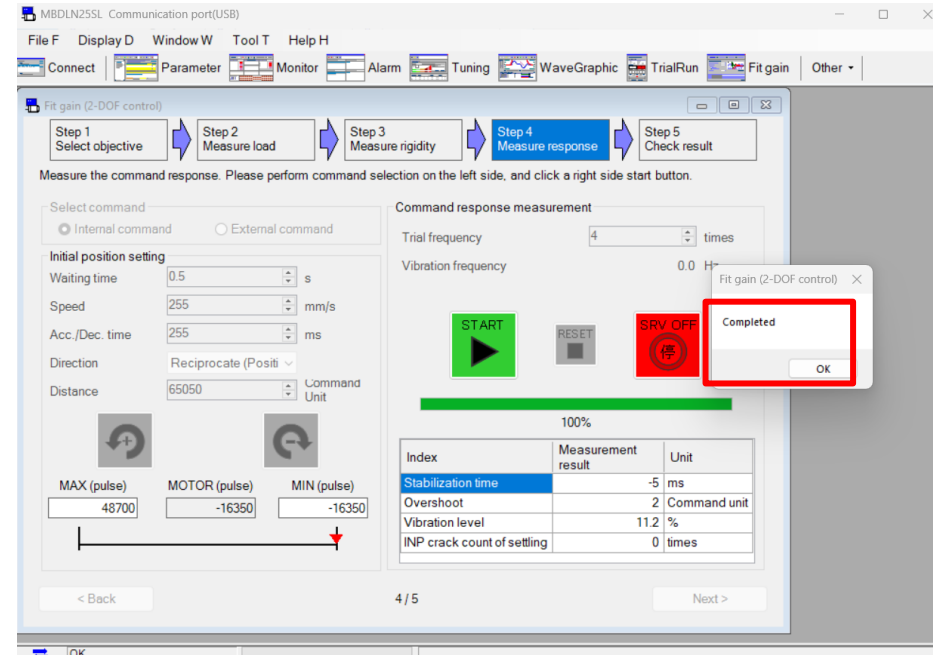
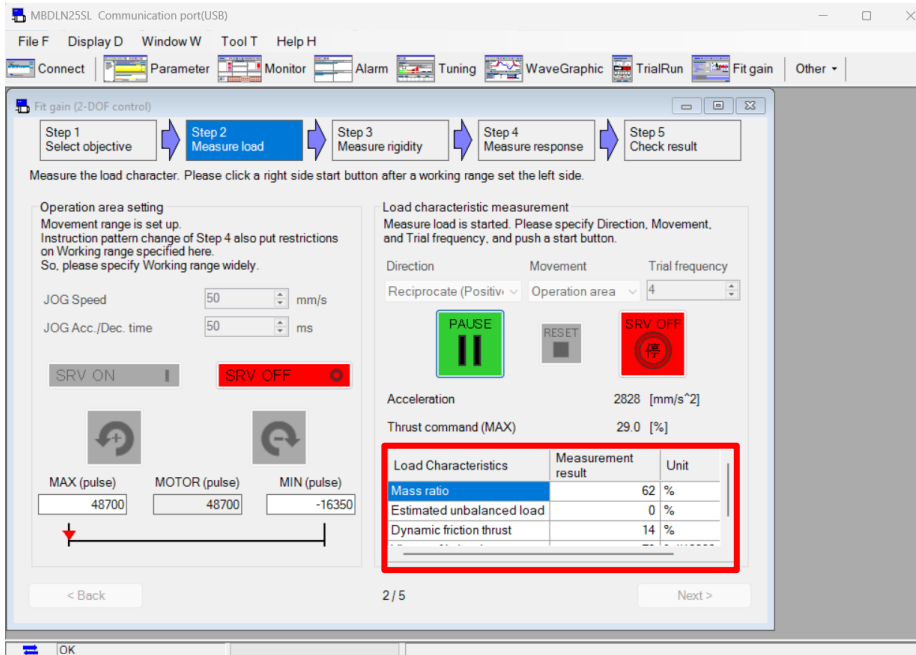
Acceleration 1000 [mm/s<sup>2</sup>]  
Thrust command (MAX) - [%]

Load Characteristics	Measurement result	Unit
Mass ratio		%
Estimated unbalanced load		%
Dynamic friction thrust		%

< Back 2/5 Next >

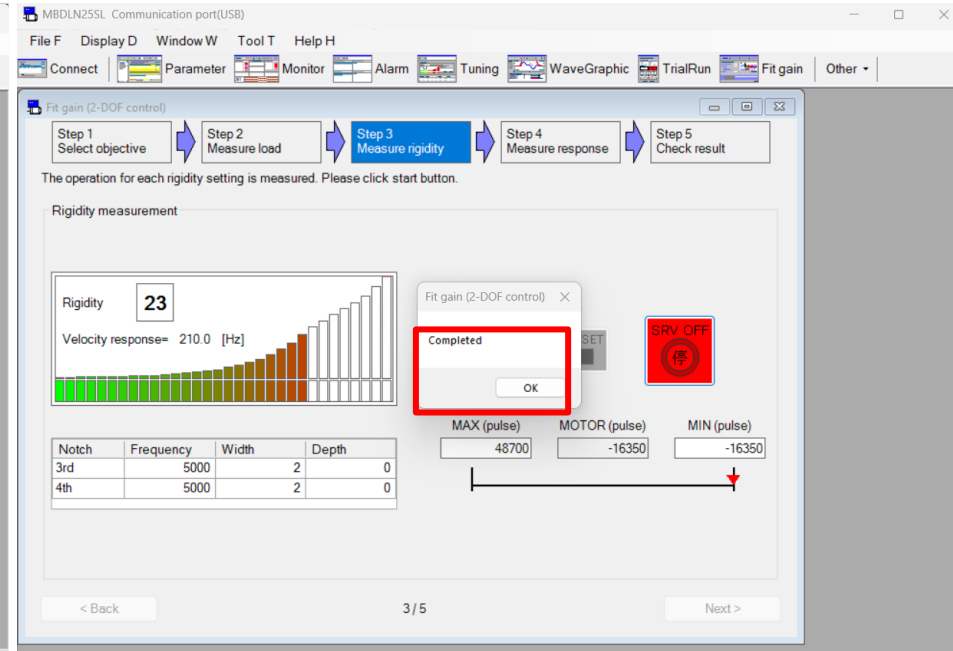
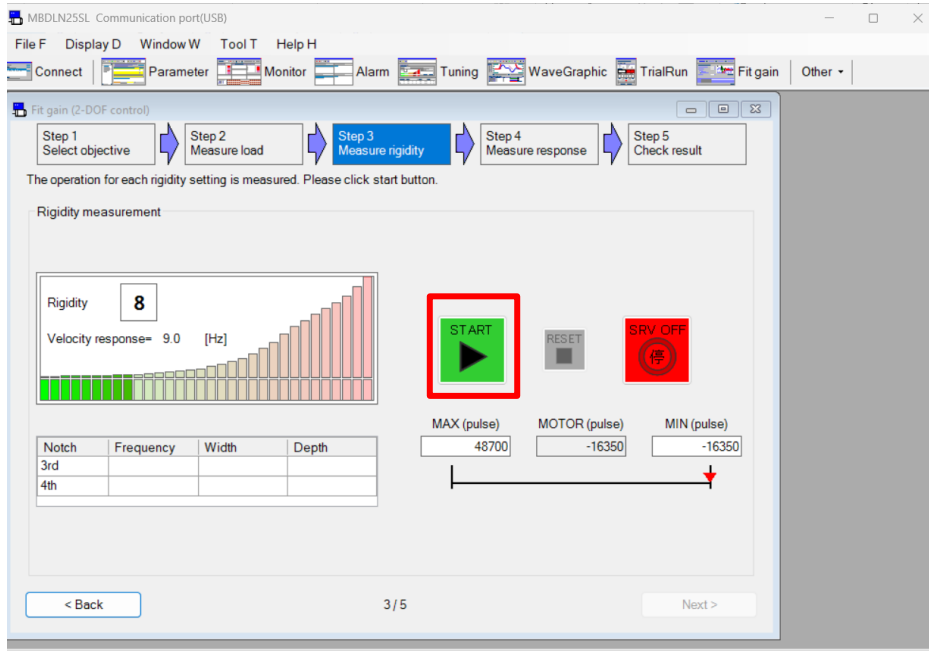
# Auto tuning

- You need to install actual load on block, if not, load measurement may failed
- Motor will move a short distance if measure load successful
- Wait for driver complete measurement, a complete pop up will show. Click OK to next step



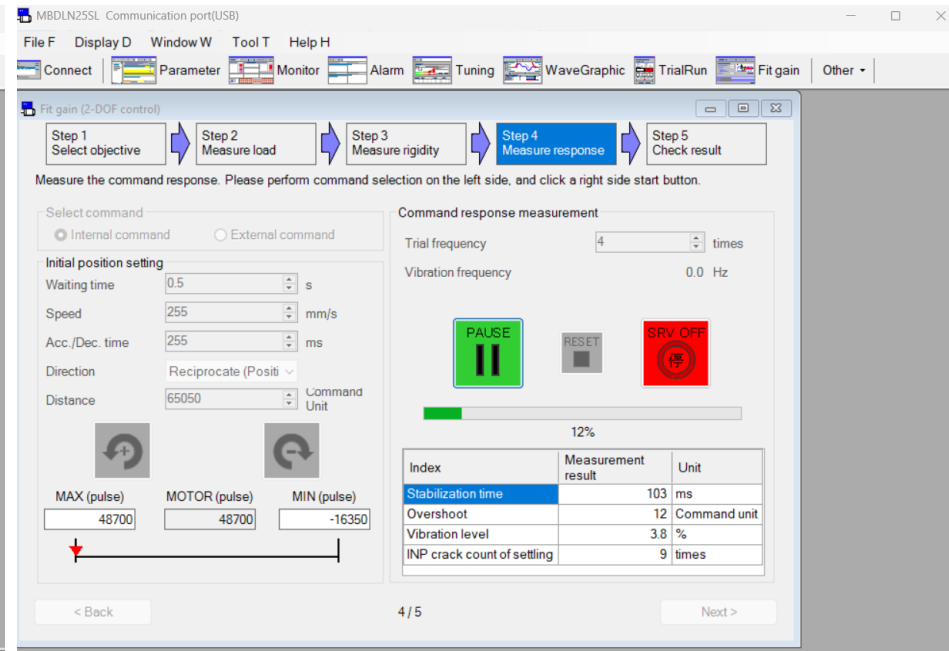
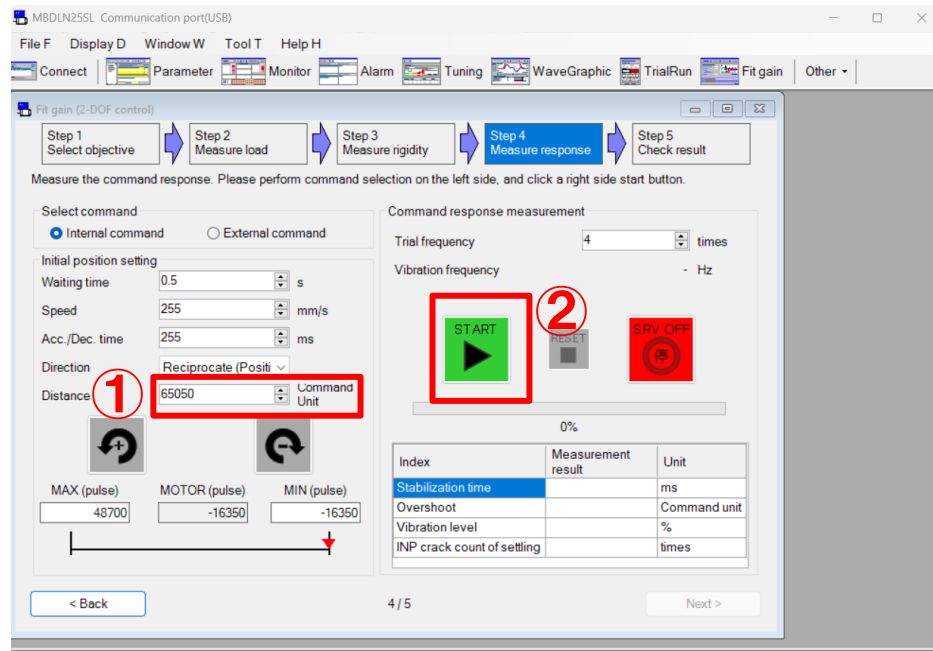
# Auto tuning

- This step measure rigidity
- Click start to process
- Wait until process complete



# Auto tuning

- This step measure and adjust tuning gain
- ①Please adjust distance as max operation area.
- Distance = Max (Pulse) – Min (Pulse)
- ②Click start to process and wait for completion



# Auto tuning

- Result tuning data show up.
- You can Start to check axes operation after auto tuning

MBDLN25SL Communication port(USB)

File F Display D Window W Tool T Help H

Connect Parameter Monitor Alarm Tuning WaveGraphic TrialRun Fit gain Other ▾

Fit gain (2-DOF control)

Step 1 Select objective → Step 2 Measure load → Step 3 Measure rigidity → Step 4 Measure response → Step 5 Check result

Check the result. If satisfactory to the result then exit the fit gain.

Recommendation setting

Recommendation setting Manual setting

The end result becomes as follows. Please choose recommendation condition.

Adjustment objective: Full search, Response preferentially, Middle rigidity

Sel...	Recommendation	Rigid...	Command r...	Stabilization t...	Overshoot(C...	Vibration lev...	INP crack co...
<input checked="" type="checkbox"/>	Minimum stabilizati...	18	0.3	-4.75	8	5.65	0
<input type="checkbox"/>	Designate oversh...						
<input type="checkbox"/>	Designate stabiliz...	19	2.2	3.0	5	6.30	0
<input type="checkbox"/>	High rigidity setting	22	0.3	-5.25	2	11.20	0
<input type="checkbox"/>	Manual setting						

Fine adjustment

START SRV OFF

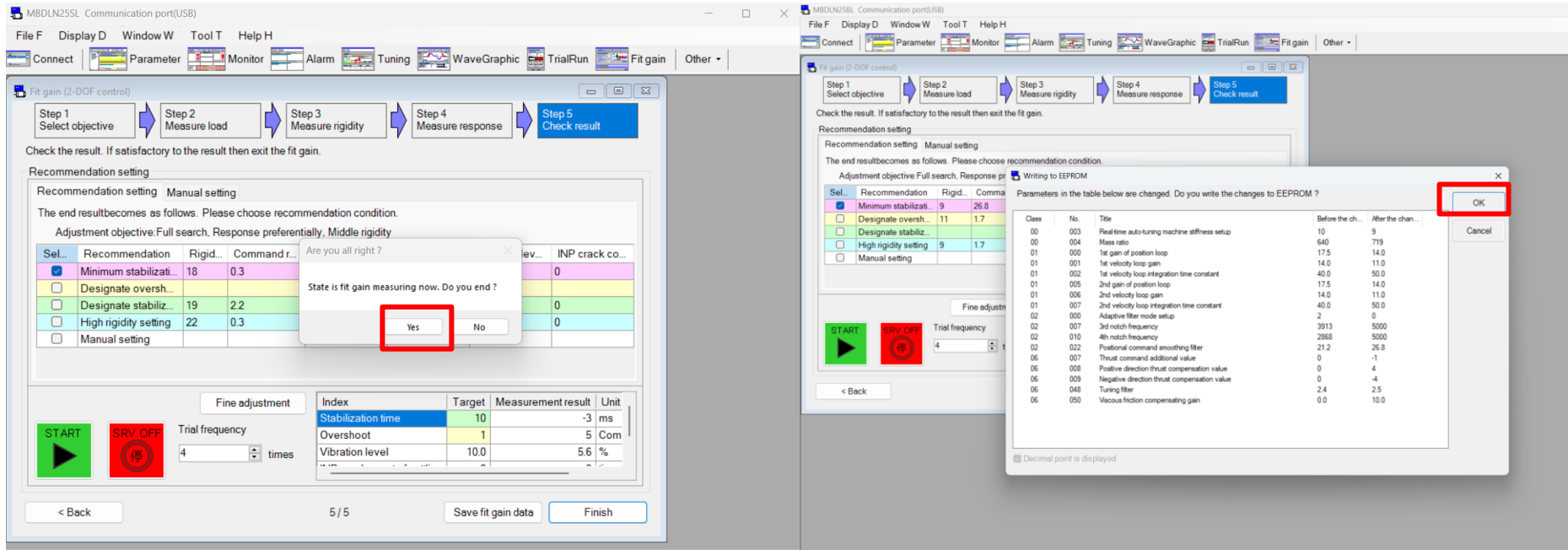
Trial frequency 4 times

Index	Target	Measurement result	Unit
Stabilization time	10		ms
Overshoot	1		Com
Vibration level	10.0		%

< Back 5 / 5 Save fit gain data Finish

# Auto tuning

- Click finish to apply new parameter
- Click yes to finish fit gain
- A comparison table show these para are going to change
- Click OK to apply new tuning parameter



MBDLN25SL Communication port(USB)

File F Display D Window W Tool T Help H

Connect Parameter Monitor Alarm Tuning WaveGraphic TrialRun Fit gain Other

Fit gain (2-DOF control)

Step 1 Select objective Step 2 Measure load Step 3 Measure rigidity Step 4 Measure response Step 5 Check result

Check the result. If satisfactory to the result then exit the fit gain.

Recommendation setting

Recommendation setting Manual setting

The end result becomes as follows. Please choose recommendation condition.

Adjustment objective: Full search, Response preferentially, Middle rigidity

Sel.	Recommendation	Rigid...	Command r...
<input checked="" type="checkbox"/>	Minimum stabilizati...	18	0.3
<input type="checkbox"/>	Designate oversh...		
<input type="checkbox"/>	Designate stabiliz...	19	2.2
<input type="checkbox"/>	High rigidity setting	22	0.3
<input type="checkbox"/>	Manual setting		

Are you all right?

State is fit gain measuring now. Do you end?

Yes No

Fine adjustment

START SRV OFF Trial frequency 4 times

Index	Target	Measurement result	Unit
Stabilization time	10	-3	ms
Overshoot	1	5	Com
Vibration level	10.0	5.6	%

< Back 5/5 Save fit gain data Finish

MBDLN25SL Communication port(USB)

File F Display D Window W Tool T Help H

Connect Parameter Monitor Alarm Tuning WaveGraphic TrialRun Fit gain Other

Fit gain (2-DOF control)

Step 1 Select objective Step 2 Measure load Step 3 Measure rigidity Step 4 Measure response Step 5 Check result

Check the result. If satisfactory to the result then exit the fit gain.

Recommendation setting

Recommendation setting Manual setting

The end result becomes as follows. Please choose recommendation condition.

Adjustment objective: Full search, Response preferentially, Middle rigidity

Sel.	Recommendation	Rigid...	Command r...
<input checked="" type="checkbox"/>	Minimum stabilizati...	9	26.8
<input type="checkbox"/>	Designate oversh...	11	1.7
<input type="checkbox"/>	Designate stabiliz...		
<input type="checkbox"/>	High rigidity setting	9	1.7
<input type="checkbox"/>	Manual setting		

Fine adjustment

START SRV OFF Trial frequency 4 times

< Back

Parameters in the table below are changed. Do you write the changes to EEPROM?

Class	No	Title	Before the ch...	After the chan...
00	003	Real-time auto-tuning machine stiffness setup	10	9
00	004	Mass ratio	640	719
01	000	1st gain of position loop	17.5	14.0
01	001	1st velocity loop gain	14.0	11.0
01	002	1st velocity loop integration time constant	40.0	50.0
01	005	2nd gain of position loop	17.5	14.0
01	006	2nd velocity loop gain	14.0	11.0
01	007	2nd velocity loop integration time constant	40.0	50.0
02	000	Adaptive filter mode setup	2	0
02	007	3rd notch frequency	3913	5000
02	010	4th notch frequency	2868	5000
02	022	Positional command smoothing filter	21.2	26.8
06	007	Thrust command additional value	0	-1
06	008	Positive direction thrust compensation value	0	4
06	009	Negative direction thrust compensation value	0	-4
06	048	Tuning filter	2.4	2.5
06	050	Vacuous friction compensating gain	0.0	10.0

Decimal point is displayed

OK Cancel

## MISUMI Contact for Linear Motor Actuators

Country	Company	Department	E-mail To:
<a href="#">Singapore</a>	MISUMI SOUTH EAST ASIA PTE. LTD.	TECHNICAL SUPPORT TEAM	techsupport@misumi.com.sg
<a href="#">Malaysia</a>	Misumi Malaysia Sdn Bhd	TECHNICAL SUPPORT TEAM	ts@misumi.com.my
<a href="#">Vietnam</a>	MISUMI VIETNAM CO.,LTD.	TECHNICAL SUPPORT TEAM	ts@misumi.com.vn
<a href="#">Thailand</a>	MISUMI (THAILAND) CO.,LTD.	TECHNICAL SUPPORT TEAM	me-ts@misumi.co.th
<a href="#">India</a>	MISUMI INDIA Pvt Ltd.	BD TEAM	BD@misumi.co.in
<a href="#">Indonesia</a>	PT. MISUMI INDONESIA	TECHNICAL SUPPORT TEAM	tech-support.fv@misumi.co.id

Revision	Date	Reviser	Approver	Remark
1.0	2024.12.21	Nguyen	Lee.Woo.Sup	First version

**MISUMI Group Southeast ASIA  
Technical Support Team**