



**LMAC Drive**

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**E-RMA series (Pulse type)**

## **Quick Start Guide**

**V 1.0**

## Contents

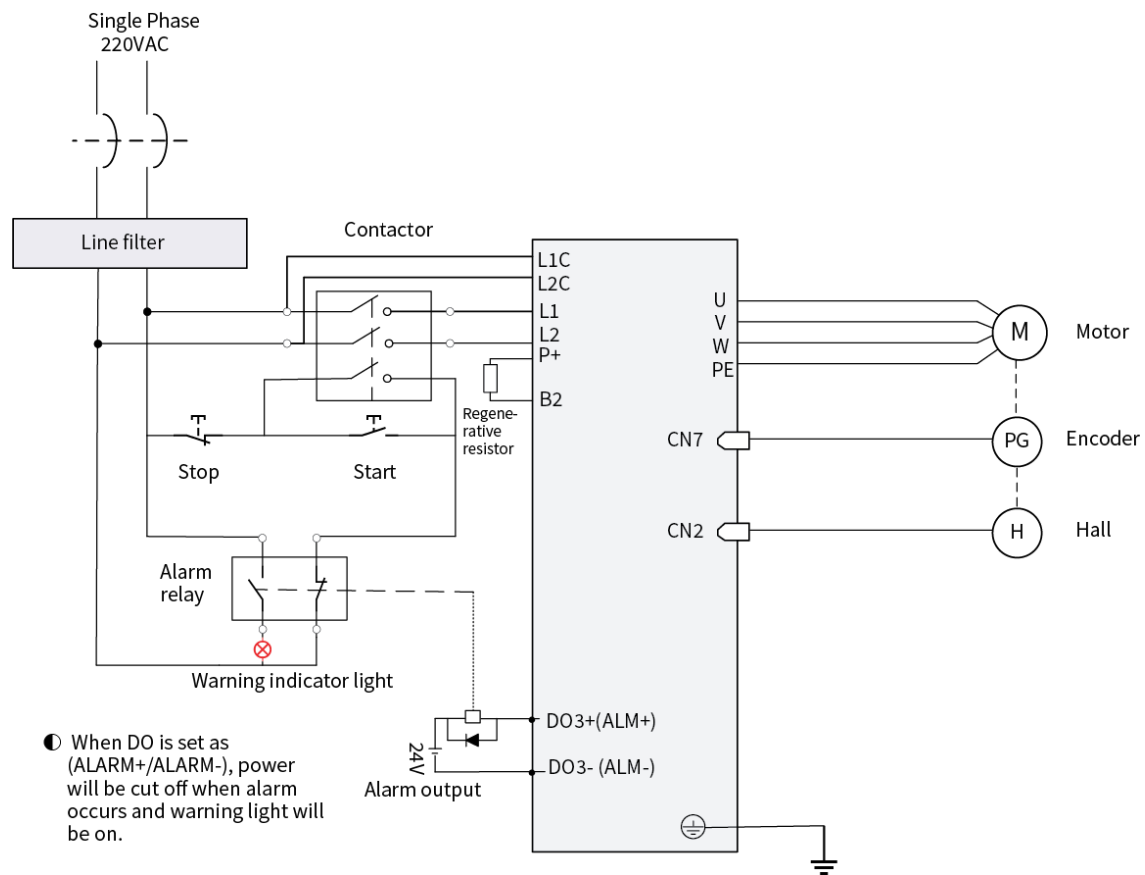
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### **Version Update Record**

<b>Version</b>	<b>Update date</b>	<b>Update content</b>
<b>V1.0</b>	<b>2025-02</b>	<b>First release</b>

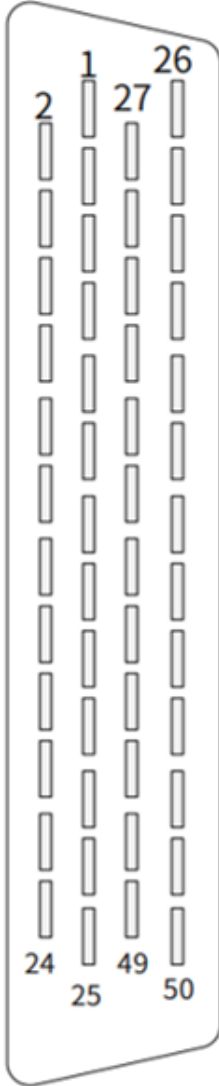
# Chapter 1. Wiring

## Main Circuit Wiring Diagram



## Control Signal Connector - CN1 Pin Assignment

To ensure I/O signal to not be affected by electromagnetic interference, a **shielded twisted pair cable** is recommended for this application.

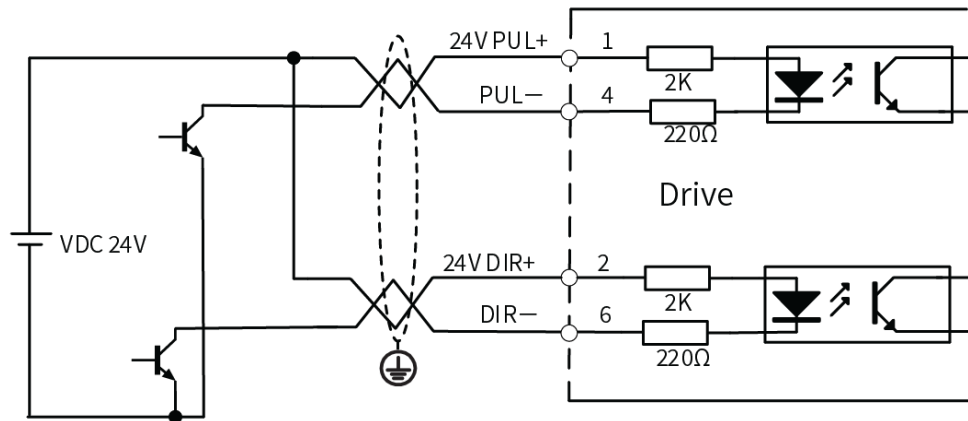
Port	Diagram (soldering side of the connector)	Pin	Label	Signal	Description (default function)
CN1		1	PUL+24	Pulse input	Low-frequency pulse train direction signal: PUL+ and PUL-: 5V differential input (500KHz) DIR+ and DIR-: 5V differential input (500KHz) PUL+24 and PUL-: 24V single end (200KHz) DIR+24 and DIR-: 24V single end (200KHz)
		3	PUL+	Pulse input	
		4	PUL-	Pulse input	
		2	DIR+24	Direction input	
		5	DIR+	Direction input	
		6	DIR-	Direction input	
		44	PULSH+	High frequency pulse input	4MHz High-frequency pulse train, 5V differential input
		45	PULSH-	High frequency pulse input	
		46	SIGNH+	High frequency direction input	4MHz High-frequency pulse train, 5V differential input
		47	SIGNH-	High frequency direction input	
		13	GND	GND	Ground
		7	DI-COM	Input	Common digital input
		8	DI1	NOT	Positive limit switch
		9	DI2	POT	Negative limit switch
		26	DI3	Null	-
		27	DI4	GAIN	Gain switching
		28	DI5	DIV1	Command multiplier switching
		29	DI6	SRV-ON	Servo on
		30	DI7	CL	Set deviation counter to zero
		31	DI8	A-CLR	Clear alarm(s)
		32	DI9	C-MODE	Control mode switching
		33	DI10	INH	Signal inhibit
		11	DO1+	BRK-OFF+	Release external brake
		10	DO1-	BRK-OFF-	
		35	DO2+	SRDY+	Servo ready signal output
		34	DO2-	SRDY-	
		37	DO3+	ALM+	Alarm output
		36	DO3-	ALM-	
		39	DO4+	INP1+	Position reached feedback signal
		38	DO4-	INP1-	
		41	DOCOM	Output	Common digital output (Max. current:50mA, Max. voltage 30V)
		12	DO5	ZSP	Velocity zero
		40	DO6	TLC	Limited torque

## 1. Single-end pulse input

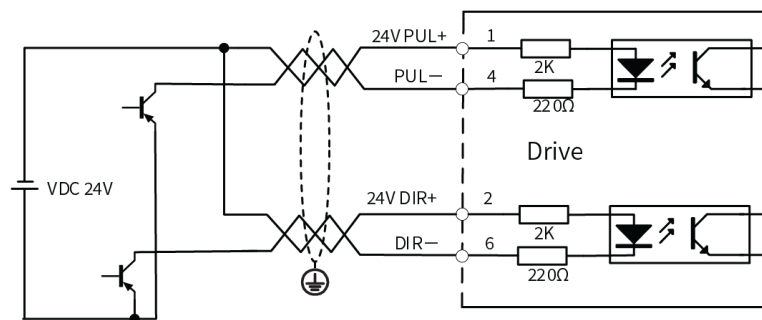
Max allowed frequency: 200kHz

Required input voltage: 12~24V

NPN connection:



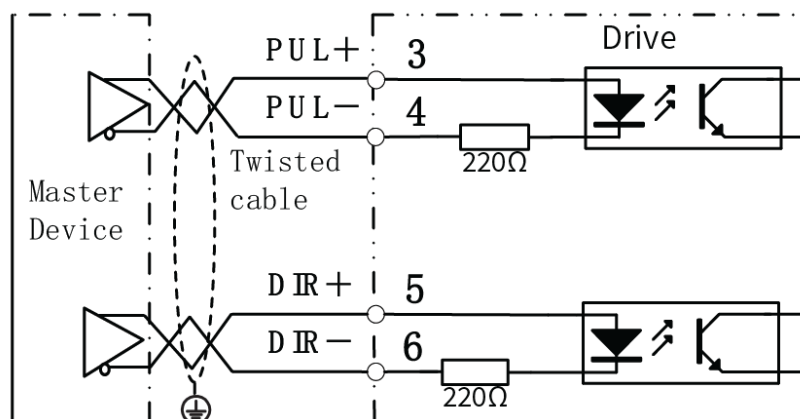
PNP connection:



## 2. 5V differential pulse input (low speed)

Max allowed frequency: 500kHz

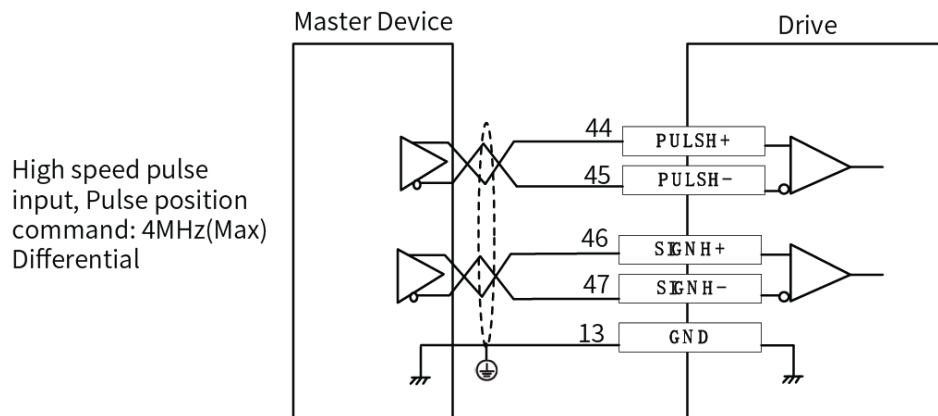
Required input voltage: ±5V



### 3. 5V differential pulse input (high speed)

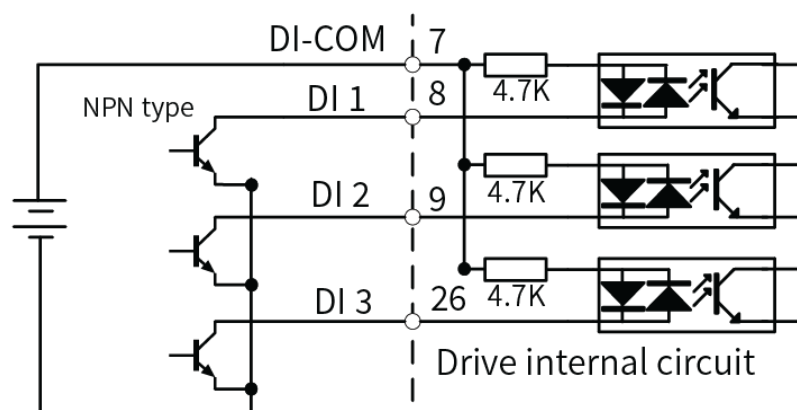
Max allowed frequency: 4MHz

Required input voltage:  $\pm 5V$

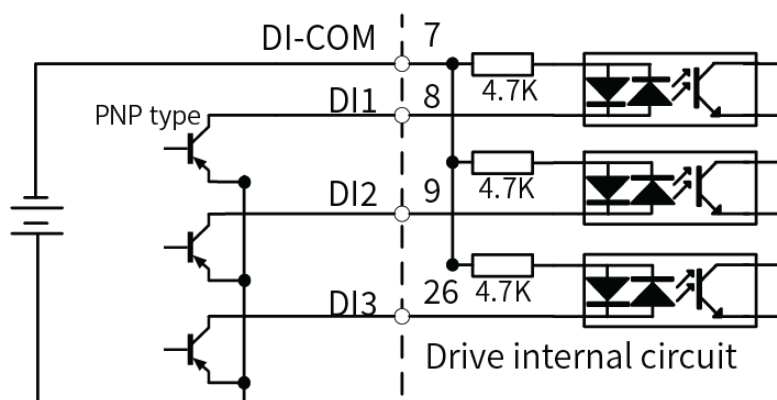


### 4. General digital input connection

**NPN connection:**

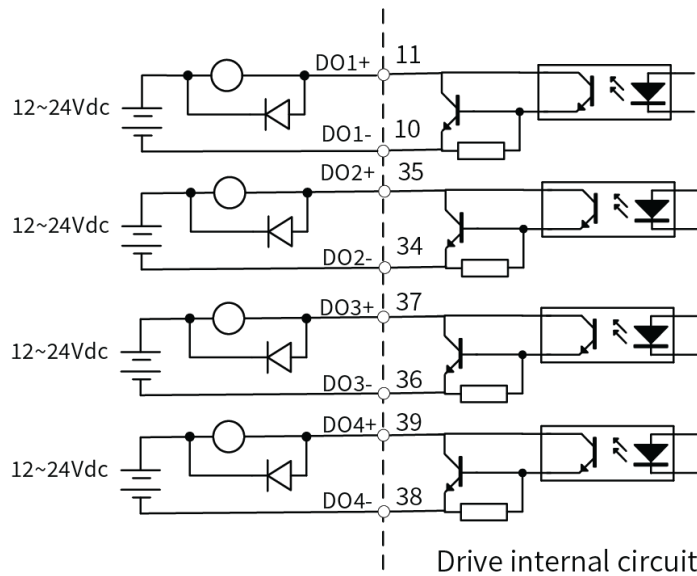


**PNP connection:**



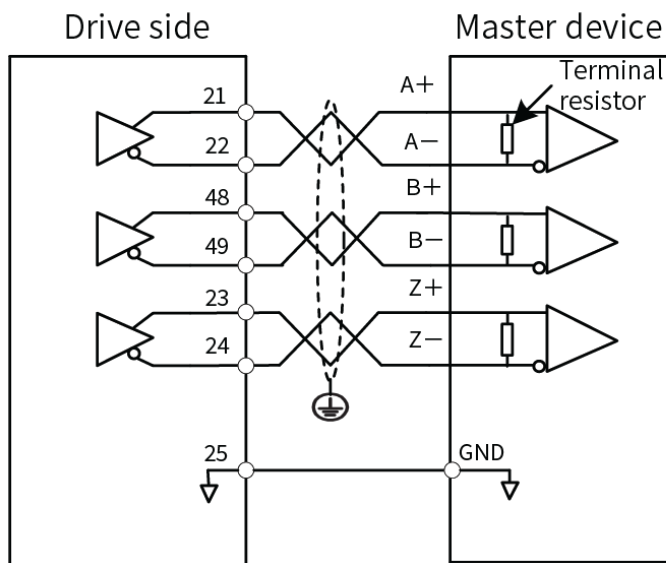
## 5. General digital output circuit

### NPN configuration



**Note:** For PNP wiring, please contact the Misumi Tech Support team.

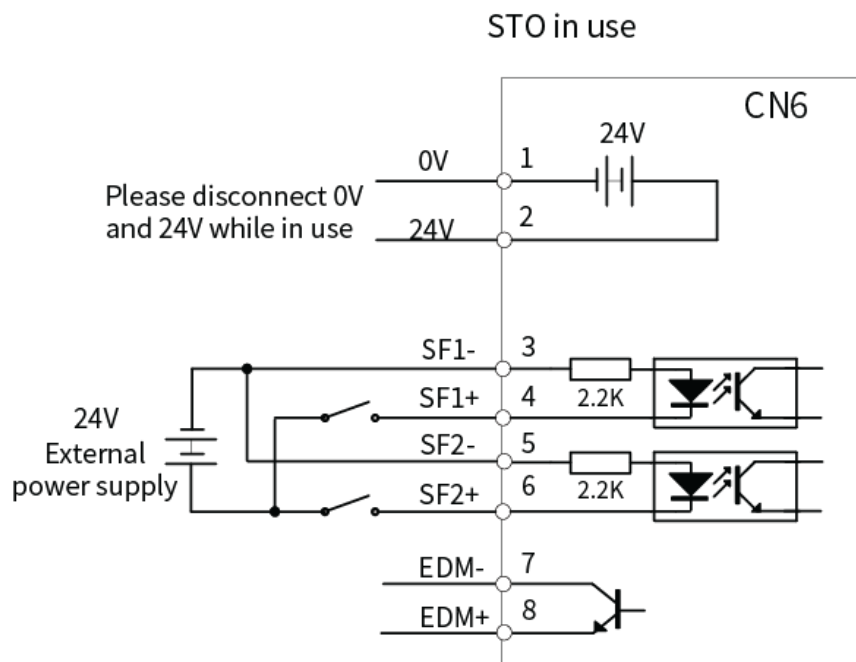
## 6. Drive frequency divider 5V output



## 7. STO wiring diagram

STO (Safe Torque Off) function: Cut off motor current supply physically (through mechanical means). The drive comes with an STO terminal pre-installed with short-circuit wiring. If the STO function is not used, do not remove the STO terminal.

STO wiring diagram when in use:



## **Chapter 2. Precautions Before Operation**

The drive and linear motor must be reliably grounded. The PE terminal of the drive must be securely connected to the equipment ground.

Ensure all wiring is correct before powering on.

An emergency stop circuit must be integrated to ensure the power supply immediately stops in case of a fault.

After a drive fault alarm, verify that the issue has been resolved before restarting, and ensure the SRV-ON signal is inactive.

Do not touch the drive within at least 5 minutes after power is turned off to prevent electric shock.

If the drive panel is unresponsive after powering on, check whether the input voltage is within the rated range and ensure there are no phase losses.

## Chapter 3. EDrive Configuration Software

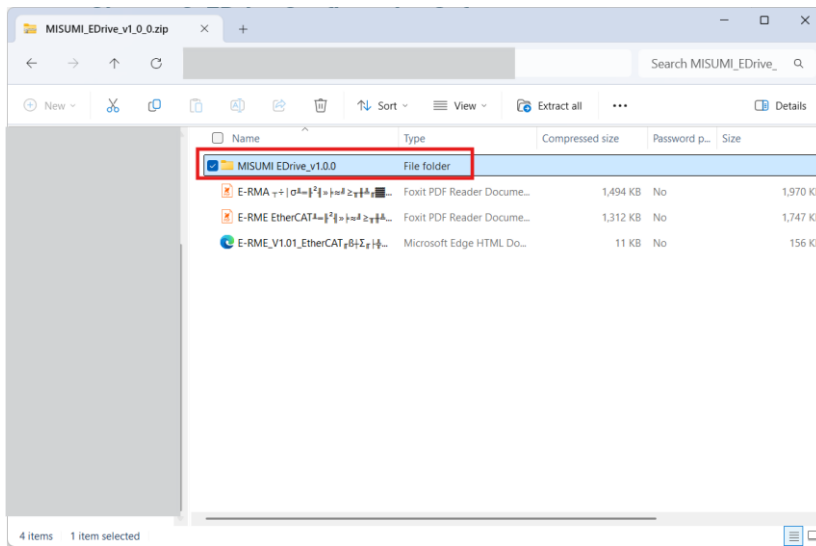
## Download EDrive Configuration Software.

Download link:

[https://www.misumi.com.cn/linked/archive/me/MISUMI\\_EDrive\\_v1\\_0\\_0.zip](https://www.misumi.com.cn/linked/archive/me/MISUMI_EDrive_v1_0_0.zip)

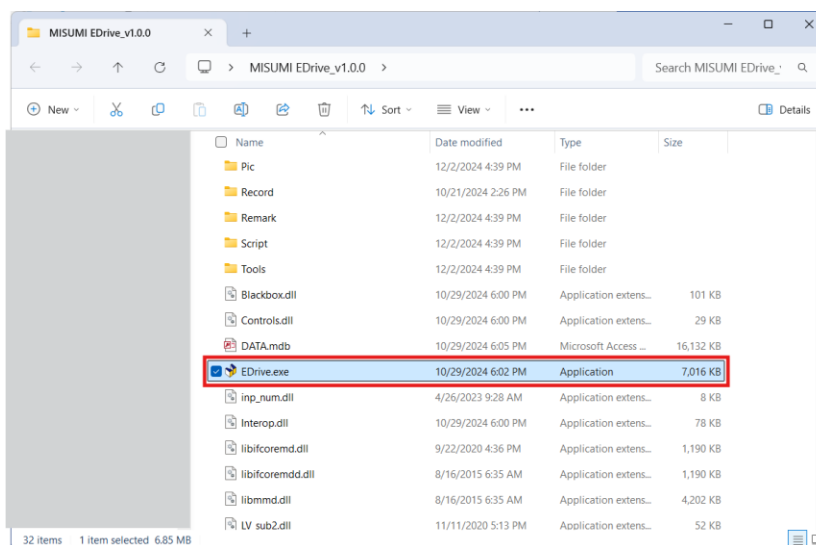
## Installation

Just unzip or pull the 'MISUMI EDrive\_v1.0.0' folder to the desktop.

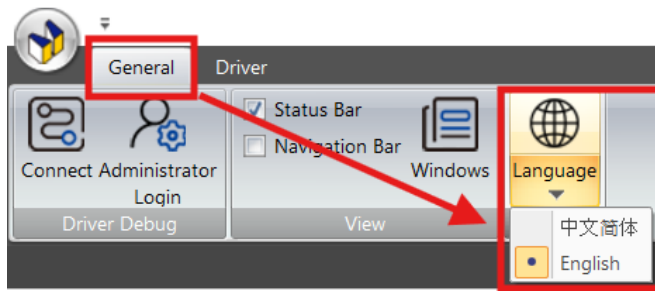


## Open Software

Double click 'EDrive.exe' to open the software.



After software opened, go to 'General' and change language to 'English'.

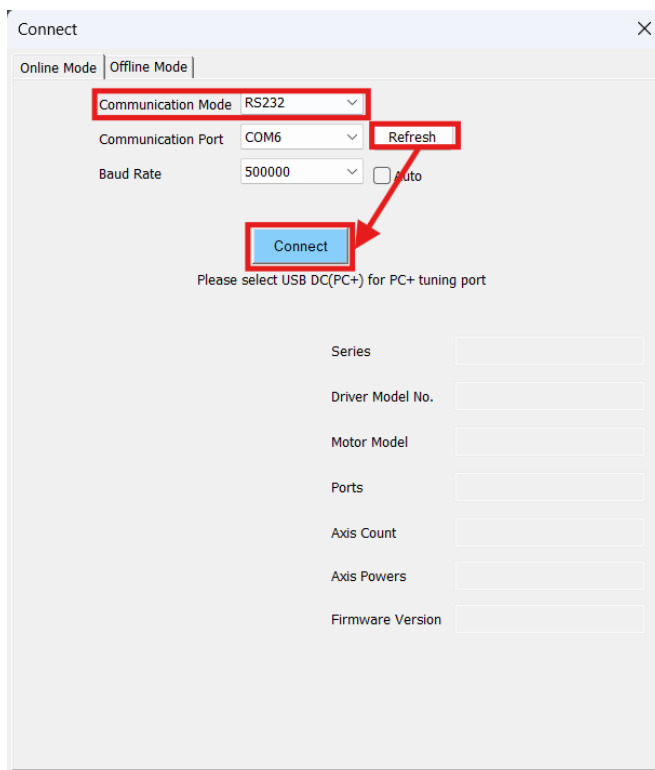


## Connect to PC

Please use cable with one side USB type-A and the other side USB type-C.

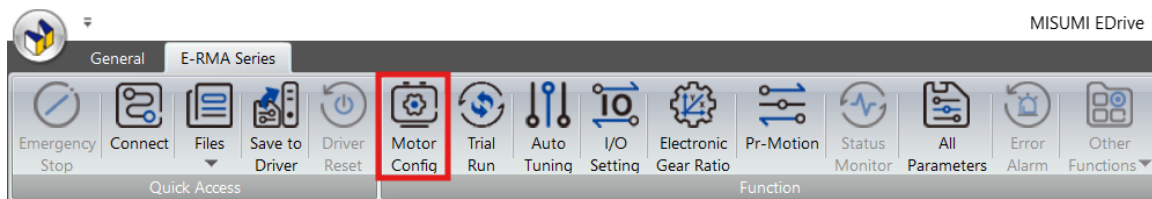


Open EDrive software and start connection. 'Communication Mode' please choose 'RS232', then click 'Refresh', then click 'Connect'.

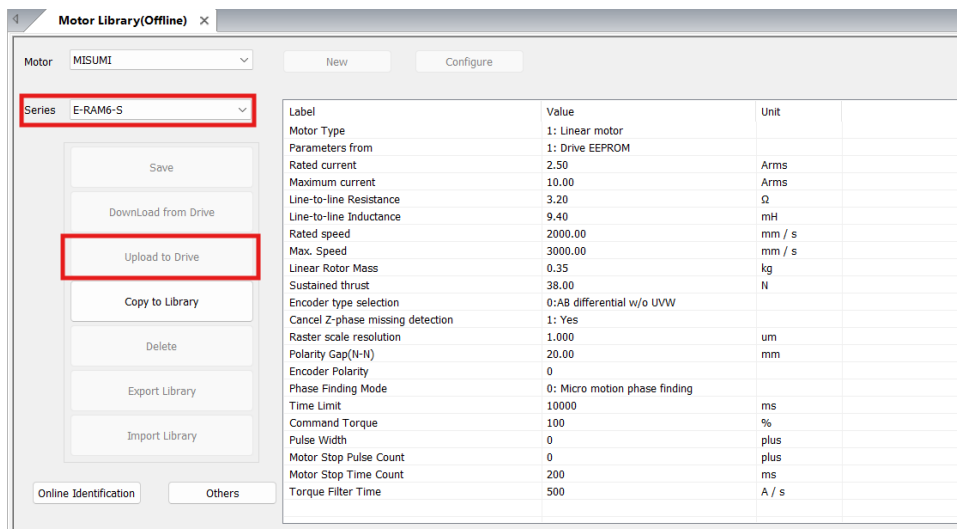


## Motor Configuration

After connection, click 'Motor Config'.



Choose LMAC module under 'Series'. Then click 'Upload to Drive'.

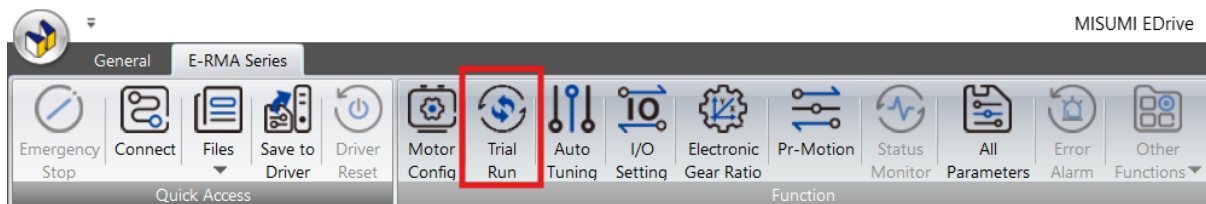


Note: The LMAC module can be identified through the markings on the side of the module slider.



## Trial Run

Click 'Trial Run'.



Click 'Servo Enable', if drive already connected to Servo ON output signal, please tick check box 'External enable disable', then click 'Forward' or 'Reverse', to move the motor.

Mode Selection To-and-fro

Step 1: JOG motion range

Positioning Teach start and end point

Teach JOG velocity 30 mm/s

Teach acceleration time 200 ms/(m/s)

Current 0.0000 mm

(4) Forward (5) Reverse

Position 1 0 mm

Position 0 mm

Position 2 0 mm

(2) Servo Enable OFF

(3) ☒ External enabling disabled

Calculated inertia ratio 53

Motor overload rate 0

Motor speed 0

Positive limit ○

Negative limit ○

Torque limit ○

Start Scope

Step 2: Position JOG

JOG Speed 50 mm/

P06.25 Acceleration of trial running 20000 mm/(s<sup>2</sup>)

JOG Torque 100 %

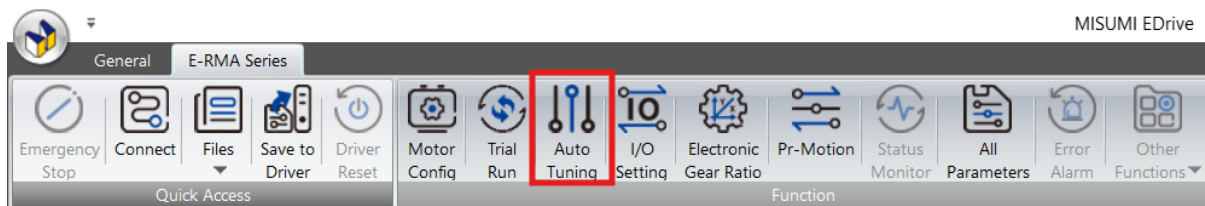
Trial Run Cycle 2 (0 = Infinite cycle)

Interval Time 1500 ms

Run Emergency Stop

## Auto Tuning

Click 'Auto Tuning'.



Click 'Next'.

Note: Other parameters are not necessary, suggest not to change.

Click 'Servo Enable'. (Note: If drive already connected Servo ON output signal, please tick check box 'External enabling disable')

Click 'Forward'. After motor reaches starting position, click 'Position 1'. Then click 'Reverse'. After motor reaches ending position, click 'Position 2'. (Note: Please always make sure motor is in between of starting position and ending position) Click 'Next', and follow the instruction to finish Auto Tuning.

Tuning settings
>>
Range of motion
>>
Tuning operation
>>
Tuning result

**Motion mode and range**

Mode Selection To-and-fro

Teach JOG velocity 30 mm/s

Teach acceleration 200 ms/(m/s)

(4)

Forward

Current  
0.0020 mm

Reverse

(6)

Position 1

(5)

Position  
102.8560 mm

Position 2

(7)

102.856 mm
 0 mm

Note: Before tuning, start and end point must be set through JOG operation and the position

**Inertia Ratio**

Default Inertia Ratio 53 ☐ Disable inertia ratio identification failure alarm

**Tuning speed limit**

Speed limit 1000 mm/s

Note: This speed limit is only effective in the tuning process. Default value is 50% of the rated

Previous

(8) Next

Warning: The setting range of linear motor is 0.5~30 pitch

Click 'Done' and follow the instruction to save parameters.

Tuning settings
>>
Range of motion
>>
Tuning operation
>>
Tuning result

Tuning result | Manual fine adjustment | Para comparison

Tuning result : Success, Used time 96 s.

Performance evaluation

In position range(Pluse)	20
Arrival counts	54
Arrival time(ms)	24
Overshoot	17
Jitter counts	1
Maximum current(%)	66
Maximum velocity(mm/s)	398

Emergency Stop

Export parameter file

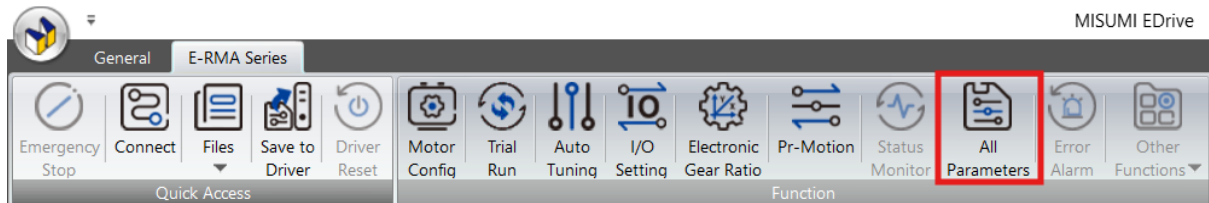
Back to Step 1

Done (9)

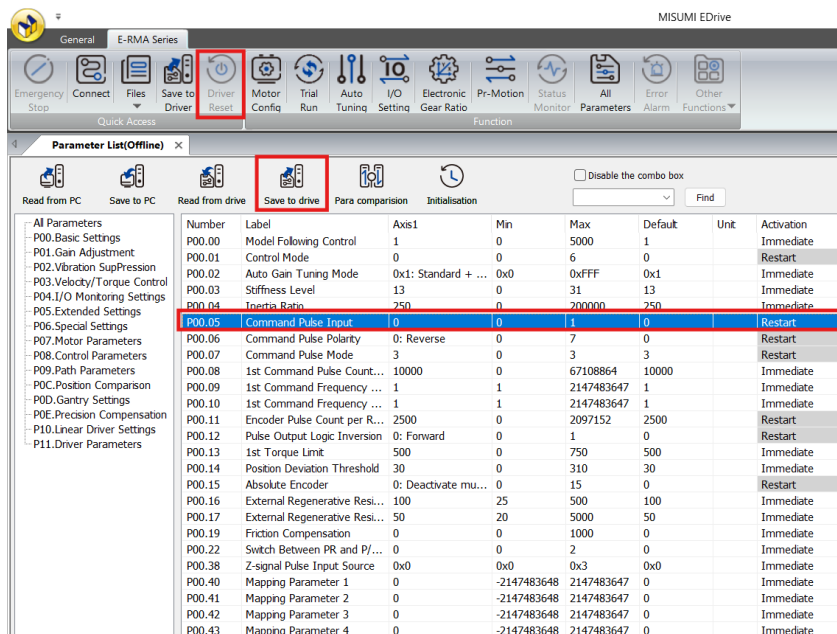
## Change Pulse Signal

E-RMA drive support 3 pulse signal. The default setting is high speed  $\pm 5V$  differential pulse signal (4MHz). If want to change to 24V single-end pulse signal (200kHz) or low speed  $\pm 5V$  differential pulse signal (500kHz), please refer to following steps.

Click 'All Parameters'.



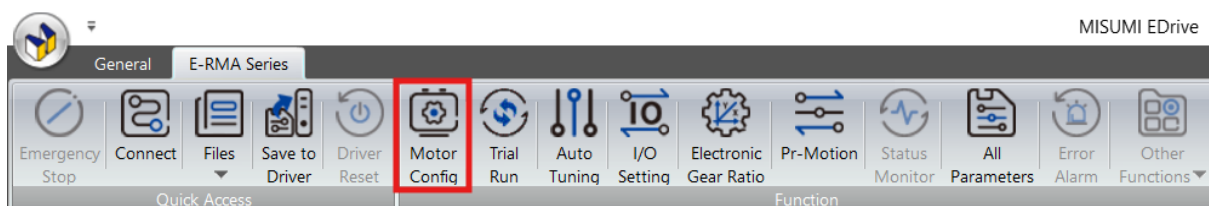
Find 'P00.05 Command Pulse Input' and change the value to '0'. Click 'Save to drive', then click 'Drive Reset'. Follow the instruction to finish saving.



## Change Motion Direction

If controller pulse train is positive direction, but motor moves to negative direction, direction change is needed. Please refer to following steps.

Click 'Motor Config'.



Click 'Others'.

Motor Library(Offline) X

Motor: MISUMI New Configure

Series: E-RAM6-S

Save  
Download from Drive  
Upload to Drive  
Copy to Library  
Delete  
Export Library  
Import Library

Online Identification Others

Label	Value	Unit
Motor Type	1: Linear motor	
Parameters from	1: Drive EEPROM	
Rated current	2.50	Arms
Maximum current	10.00	Arms
Line-to-line Resistance	3.20	Ω
Line-to-line Inductance	9.40	mH
Rated speed	2000.00	mm / s
Max. Speed	3000.00	mm / s
Linear Rotor Mass	0.35	kg
Sustained thrust	38.00	N
Encoder type selection	0:AB differential w/o UVW	
Cancel Z-phase missing detection	1: Yes	
Raster scale resolution	1.000	um
Polarity Gap(N-N)	20.00	mm
Encoder Polarity	0	
Phase Finding Mode	0: Micro motion phase finding	
Time Limit	10000	ms
Command Torque	100	%
Pulse Width	0	plus
Motor Stop Pulse Count	0	plus
Motor Stop Time Count	200	ms
Torque Filter Time	500	A / s

Change to '1: reverse' under 'Command pulse polarity', then click 'Write' and follow the instruction to save parameters.

Others X

Control Mode: 9:indicates the EC mox

Command pulse polarity: 0:not reverse  
0:not reverse  
1:reverse

Command pulse input mode: 0: pulse direction

Position Command Pulse Filter: 8 \* 50ns

Electronic Gear Settings (After): 1 um/Pluse

6092-1: 8388608

6092-2: 1

Read from Drive Write

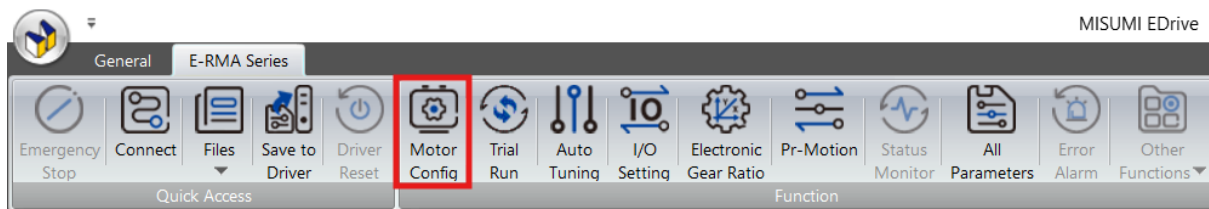
## Change Gear Ratio

Misumi LMAC electrical cycle length is 20 mm = 20,000 um.

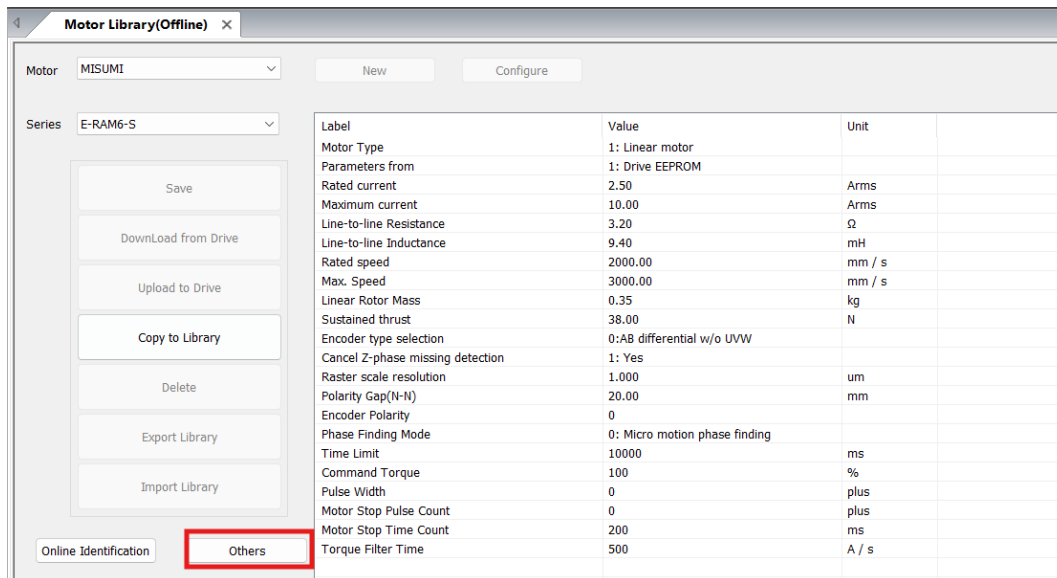
The default setting of drive is 1 pulse equal to 0.001mm. If controller's pulse frequency is not high enough, and causes the speed cannot meet the requirement, please refer to following steps.

Click 'Motor Config'.

## E-RMA series (Pulse type) Quick Start Guide

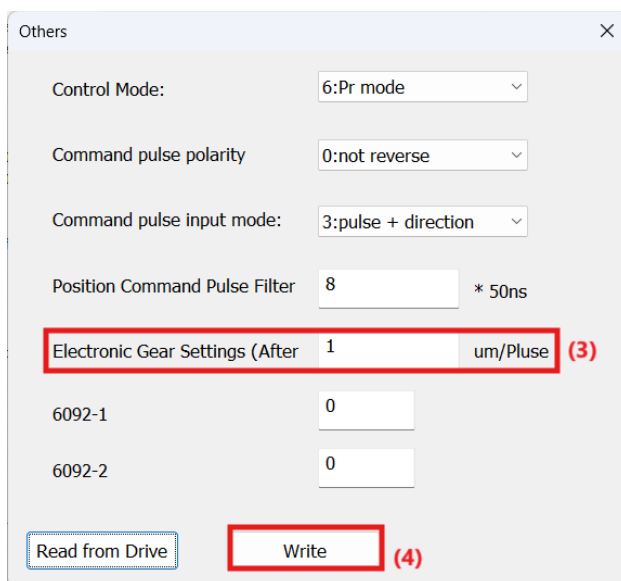


Click 'Others'.



Change the value of 'Electronic Gear Settings (After calculation)', then click 'Write' and follow the instruction to save parameters.

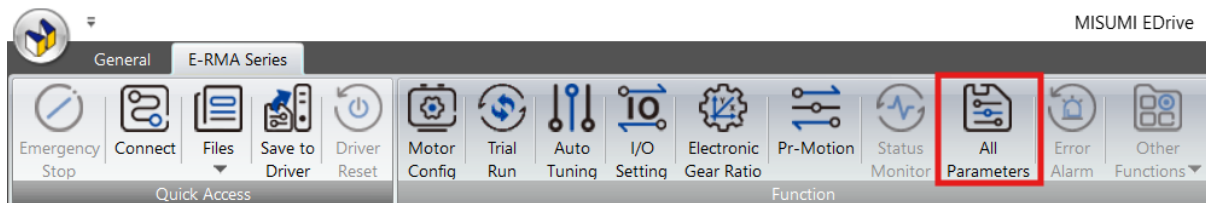
Example: Default setting is 1 pulse = 0.001mm. If want to change to 1 pulse = 0.01mm, please change the value of 'Electronic Gear Settings (After calculation)' to 10.



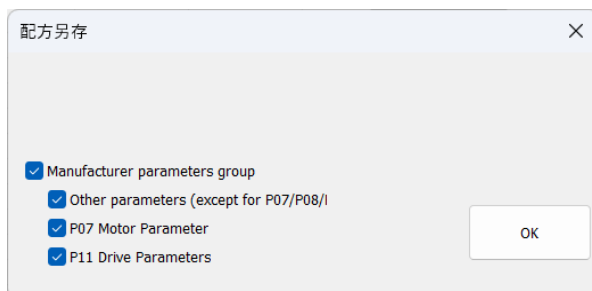
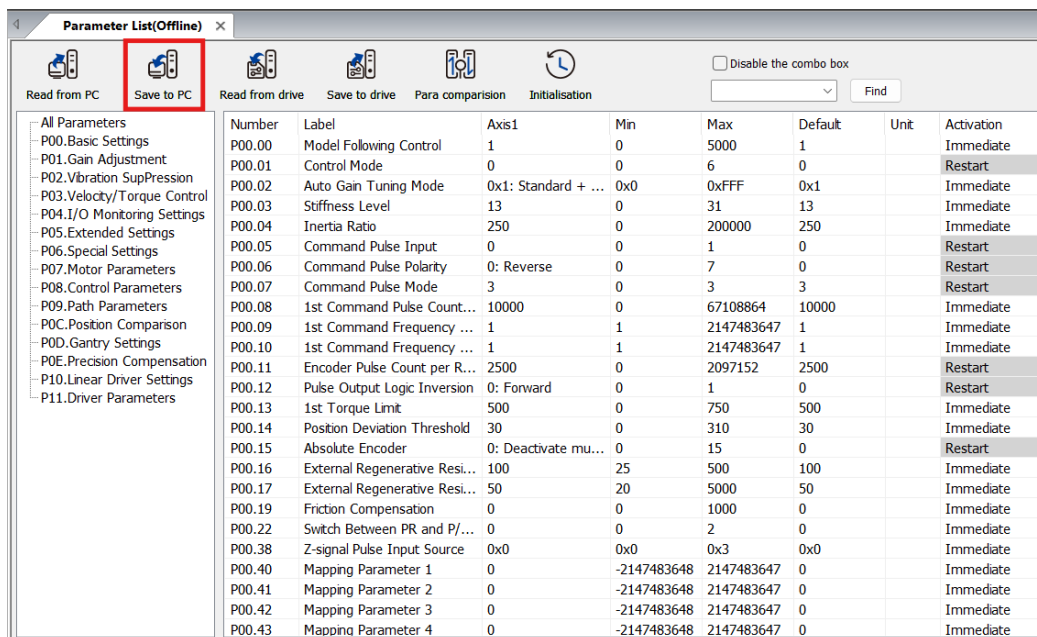
## Parameter Backup and Download

Please refer to following steps to backup parameters.

Click 'All Parameters'.



Click 'Save to PC' and follow the instruction to finish saving.



When download parameters, click 'Read from PC'.

## E-RMA series (Pulse type) Quick Start Guide

Parameter List(Offline)

Read from PC

Save to PC

Read from drive

Save to drive

Para comparison

Initialisation

Disable the combo box

Find

All Parameters

P00.Basic Settings

P01.Gain Adjustment

P02.Vibration SupPression

P03.Velocity/Torque Control

P04.I/O Monitoring Settings

P05.Extended Settings

P06.Special Settings

P07.Motor Parameters

P08.Control Parameters

P09.Path Parameters

P10.Position Comparison

P11.Linear Driver Settings

P11.Driver Parameters

Number	Label	Axis1	Min	Max	Default	Unit	Activation
P00.00	Model Following Control	1	0	5000	1		Immediate
P00.01	Control Mode	0	0	6	0		Restart
P00.02	Auto Gain Tuning Mode	0x1: Standard + ...	0x0	0xFF	0x1		Immediate
P00.03	Stiffness Level	13	0	31	13		Immediate
P00.04	Inertia Ratio	250	0	200000	250		Immediate
P00.05	Command Pulse Input	0	0	1	0		Restart
P00.06	Command Pulse Polarity	0: Reverse	0	7	0		Restart
P00.07	Command Pulse Mode	3	0	3	3		Restart
P00.08	1st Command Pulse Count...	10000	0	67108864	10000		Immediate
P00.09	1st Command Frequency ...	1	1	2147483647	1		Immediate
P00.10	1st Command Frequency ...	1	1	2147483647	1		Immediate
P00.11	Encoder Pulse Count per R...	2500	0	2097152	2500		Restart
P00.12	Pulse Output Logic Inversion	0: Forward	0	1	0		Restart
P00.13	1st Torque Limit	500	0	750	500		Immediate
P00.14	Position Deviation Threshold	30	0	310	30		Immediate
P00.15	Absolute Encoder	0: Deactivate mu...	0	15	0		Restart
P00.16	External Regenerative Resi...	100	25	500	100		Immediate
P00.17	External Regenerative Resi...	50	20	5000	50		Immediate
P00.19	Friction Compensation	0	0	1000	0		Immediate
P00.22	Switch Between PR and P/...	0	0	2	0		Immediate
P00.38	Z-signal Pulse Input Source	0x0	0x0	0x3	0x0		Immediate
P00.40	Mapping Parameter 1	0	-2147483648	2147483647	0		Immediate
P00.41	Mapping Parameter 2	0	-2147483648	2147483647	0		Immediate
P00.42	Mapping Parameter 3	0	-2147483648	2147483647	0		Immediate
P00.43	Mapping Parameter 4	0	-2147483648	2147483647	0		Immediate

Choose the parameter file you saved, and it will be shown in a new tab. Click 'Save to drive', then click 'Drive Reset'. Follow the instruction to finish saving.

<

## Controller Axis Configuration Precautions

1. When controller uses **pulse** unit.

Recommend configuration: Pulse number = Encoder count number. Then LMAC electrical cycle length: 20,000 pulses, the amount of movement of the worktable in a circle: 20,000 (counts)

Example: Controller sends 1,000 pulses, and motor moves 1,000  $\mu\text{m}$  = 1 mm.

2. When controller use **mm** unit.

Recommend configuration: Pulse number = Encoder count number. Then LMAC electrical cycle length: 20,000 pulses, the amount of movement of the worktable in a circle: 20 (mm)

Example: Motor moves 1 mm = 1,000 um, and controller needs to send 1,000 pulses.

Note: This setting takes effect when the electronic gear ratio of the drive side is 1:1.