



杰美康机电
JUST MOTION CONTROL



MCAC706

Digital AC Servo Drive Manual

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Preface

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1 .Overview

MCAC706 is designed and manufactured using DSP vector control, closed

loop servo drives with low-cost and all-digital AC. It includes three adjustable feedback loop control which are position loop, speed loop and current loop. It has stable performance which suitable for driving voltages below 50V and power below 400W AC servo motor.

2.Characteristic

2.1 More than one kinds of pulse input mode

Pulse + direction

CW / CCW double pulse

A / B phase pulse

2.2 Servo reset input interface optocoupler isolation ERC

2.3 Current loop bandwidth: (-3dB) 2KHz (the typical value)

2.4 Speed loop bandwidth: 500Hz (the typical value)

2.5 Position loop bandwidth: 200Hz (the typical value)

2.6 Motor encoder inputs upright post :differential input (26LS32)

2.7 RS232C interface parameters available to download via PC or text display

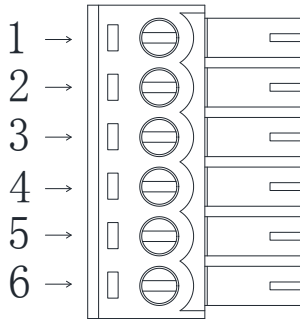
2.8 Overcurrent, I2T, overvoltage, undervoltage,

Overtemperature, speeding, over-differential protection

2.9 The green light indicates running and the red light indicates that the protection or offline

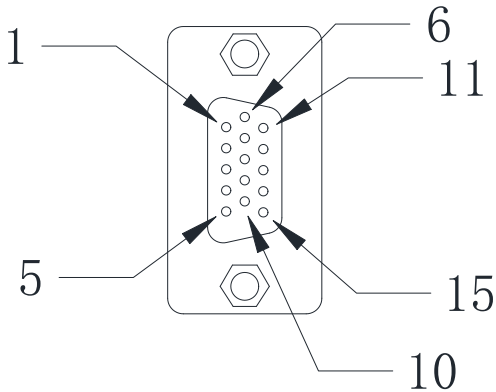
3. Ports Description and definition

3.1 The input / output port of Control signal



Terminal No.	Sign	Name	Description
1	PUL+	Positive input pulse	High level 4 ~ 5V effective
2	PUL-	Negative input pulse	Low level 0 ~ 0.5V effective
3	DIR+	The direction of the positive input	High level 4 ~ 5V effective
4	DIR-	The direction of the negative input	Low level 0 ~ 0.5V effective
5	ERC+	Servo Reset positive input	High level 4 ~ 5V effective
6	ERC-	Servo Reset negative input	Low level 0 ~ 0.5V effective

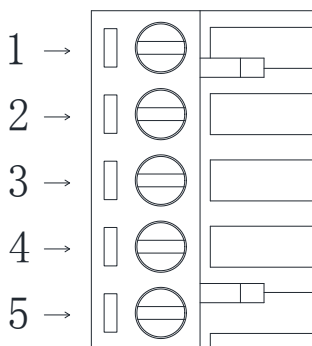
3.2 The input port of encoder feedback signal (D15 female)



Terminal No.	Sign	Name	Description
1	GND	output power ground	
2	VCC	output power supply	50 Milliampere
3	PW+	W-phase pole positive input	Single-side connection
4	PV+	V-phase pole positive input	Single-side connection
5	PU+	u-phase pole positive input	Single-side connection
6	PZ+	z-phase pole positive input	
7	PB+	B-phase pole positive input	
8	PA+	A-phase pole positive input	
9	NC		
10	NC		
11	NC		

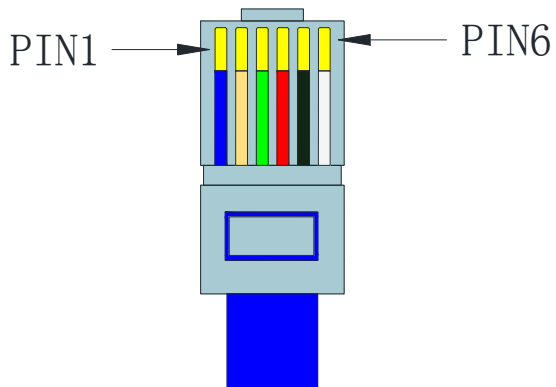
12	NC		
13	PZ-	Z-phase Encoder negative input	
14	PB-	B-phase Encoder negative input	
15	PA-	A-phase Encoder negative input	

3.3 Power port



Terminal No.	Identification	Sign	Name	Description
1	motor phase	W	W	
2		V	V	
3		U	U	
4	power supply input	VDC	Input DC power supply positive	
5		GND	Input power ground	

3.4 The definition Crystal Head Connection



Pin No.	Definition
PIN1	TXD
PIN2	RXD
PIN3	NC
PIN4	NC
PIN5	NC
PIN6	GND

4.The parameters of the servo system description and Settings

4.1 parameter list :

Module	Name of parameter	instructions	Factor y Default	Range
Communication setting	Port number	According to the selection of effective COM port using the PC machine	specific	specific
	baud rate	Set the baud rate of 232	57600	57600
system configuration	Encoder line number	According to the motor encoder type selection, the current can be selected: 1000 line 1250 line 2500 line	specific	1~ 2500
	Electronic gear ratio molecular	$G = \frac{\text{molecular}}{\text{denominator}}$ <i>N</i> : Motor rotation laps <i>C</i> : encoder line number <i>P</i> : Each lap input pulse number	1	1~255
	Electronic gear ratio denominator	<i>case</i> : Encoder line number is 2500 ; Each lap input pulse number is 3200 ; Electronic gear ratio ? $G = \frac{N \times C \times 4}{P} = \frac{1 \times 2500 \times 4}{3200} = \frac{10000}{3200} = \frac{25}{8}$	1	1~255

	control model	Position control, speed control, torque control	Position control	Position control
	Input model	Pulse control, digital quantity, oblique wave energy	Pulse control	Pulse control
	Signal type	Pulse + direction ,Pulse +opposite direction ,double pulse,double pulse+opposite direction	Pulse + direction	Pulse + direction, Pulse + opposite direction
	Servo control	External control, internal control	internal control	internal control
Parameter setting	Position ratio	<ul style="list-style-type: none"> ▶ Proportional gain of a set of position loop regulator ▶ The larger the set value, the higher the gain, the greater the stiffness, the smaller the 	2000	1000~20000

	<p>position lag, but the numerical value is too large</p> <ul style="list-style-type: none"> ▶ In the case of no shock value as much as possible 		
Position feedforward	<ul style="list-style-type: none"> ▶ Set to 0 when the feed is not added, the greater the value, the greater the feedforward ▶ The greater the position loop feedforward, the better response characteristics of the system, too large system will advance 	500	0~1000
Position deviation	<ul style="list-style-type: none"> ▶ Adjust the system to allow the following deviation and positioning deviation, over the system will alarm ▶ According to the demand adjustment, the value is too small, in the high frequency system is easy to alarm <p>Said 0 position deviation is not calculated, no alarm</p>	30000	10000~30000
Position	Default 0, no need to set	0	no need

different ial			to set
Position filter	Adjusting position loop filter coefficient	1	0~7
Speed ratio	<ul style="list-style-type: none"> ▸ Proportional gain of set speed loop regulator ▸ The greater the setting value, the greater the gain and stiffness, the parameter values are set according to the motor and load conditions ▸ In the case of no shock value as much as possible 	6000	2000~20000
Velocity integral	<ul style="list-style-type: none"> ▸ Time constant of setting speed loop controller ▸ The greater the value of the system, the stronger the ability of the system, but too much of the general assembly to cause the system overshoot ▸ In the case of the system does not shake and overshoot, set the value as much as possible 	500	0~3000
Velocity different	Default 0, no need to set	0	no need to set

ial			
Acceleration feed-forward	Improve the acceleration feedback before smoothness adjustable system, response time and loss	0	0~30000
velocity filtering	Adjust the speed loop filter coefficient	7	0~7
Rated speed	Default 0, no need to set		no need to set
Maximum speed limit	<ul style="list-style-type: none"> ▸ Set the maximum speed of motor rotation ▸ The parameter value is 16383 equal to 3000 	16383	16383
acceleration	Internal acceleration	255	0-255
deceleration	Internal reduction rate	255	0-255
Current ratio	<ul style="list-style-type: none"> ▸ Current proportion gain, according to the motor current, the set value can be adjusted properly, the greater the value, the greater the sound of the motor running ▸ This parameter is generally not adjusted 	2000	1000~3000

Current integration	<ul style="list-style-type: none"> ▸ Current integration, according to the motor current is greater, the set value can be adjusted properly, the greater the value, the greater the sound of the motor running ▸ This parameter is generally not adjusted 	500	100~1000
Rated current	Factory configuration, change may cause system failure	5000	2500~15000
Maximum current limit	Factory configuration, change may cause system failure	8000	2500~15000
threshold temperature protection	Fixed value, factory configuration, change may cause system failure	specific	Fixed value
Overvoltage protection threshold	Fixed value, factory configuration, change may cause system failure	specific	Fixed value
Undervoltage	System default	System default	no need to set

protectio n threshold		t	
I2T protectio n threshold	System default	System defaul t	no need to set

4.2 Parameter setting method :

See Appendix 1

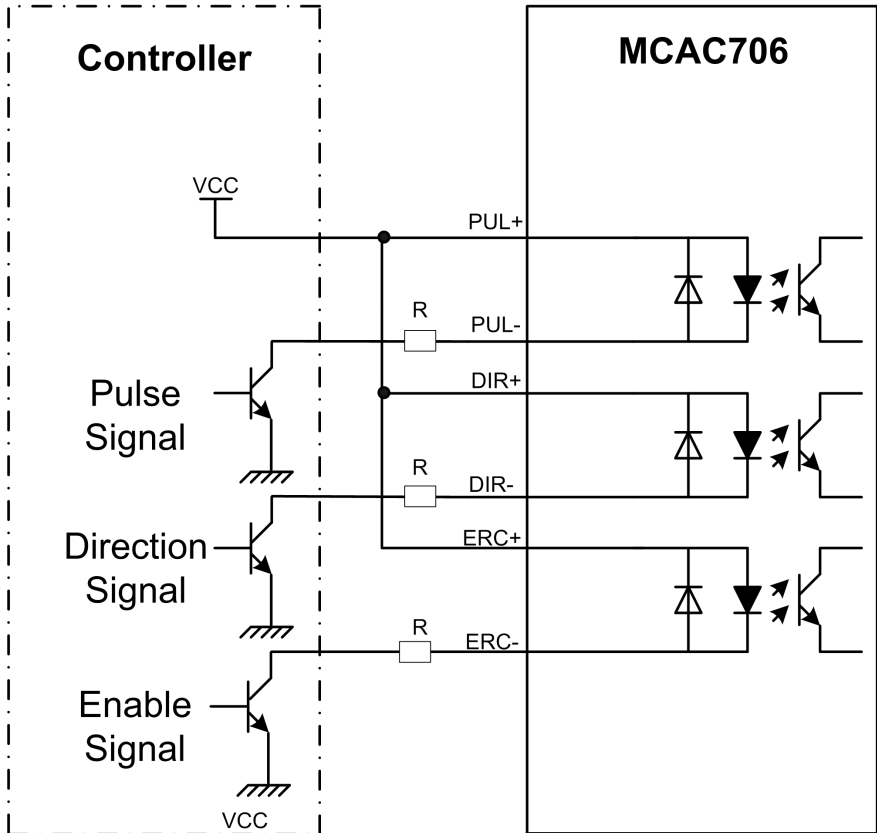
5.Technical indicators

input voltage	24~70VDC(36V typical value)
Continuous output current	6A
Maximum pulse frequency	300K
Default rate	9.6Kbps (Required external conversion interface)
protect	<ul style="list-style-type: none"> ▶ Peak value of over current action value 30A + 10% ▶ Overload I2t current action value of 300% 5S <ul style="list-style-type: none"> ▶ Overheating action value of 80 ▶ Overvoltage action value 65V ▶ Action value of under voltage voltage 18V

Use environment	occasion	As far as possible to avoid dust, oil mist and corrosive gases
	working temperature	0~+70°C
	Storage temperature	-20°C~+80°C
	humidity	40~90%RH
	Cooling mode	Natural cooling or forced air cooling

6 .Control signal connection

6.1Connections to Common Anode



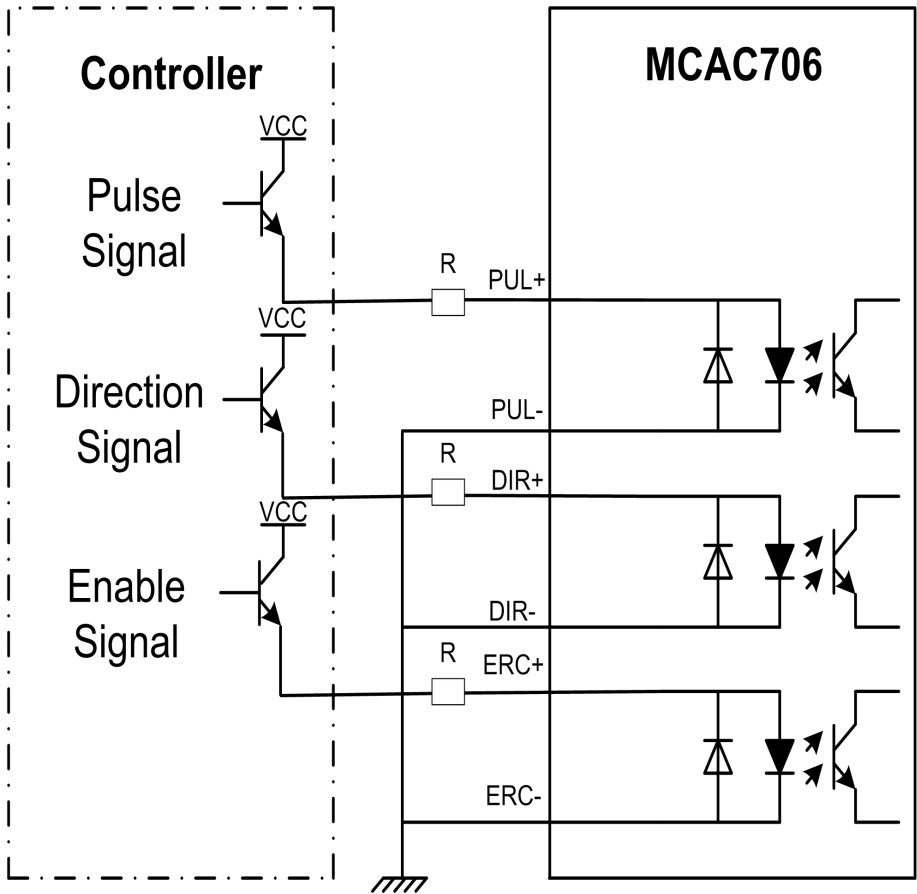
Note: When VCC is 5V, R shorted;

When VCC is 12V, R is 1K, more than 0.125W resistance;

VCC is 24V, R is 2K, 0.125W greater resistance;

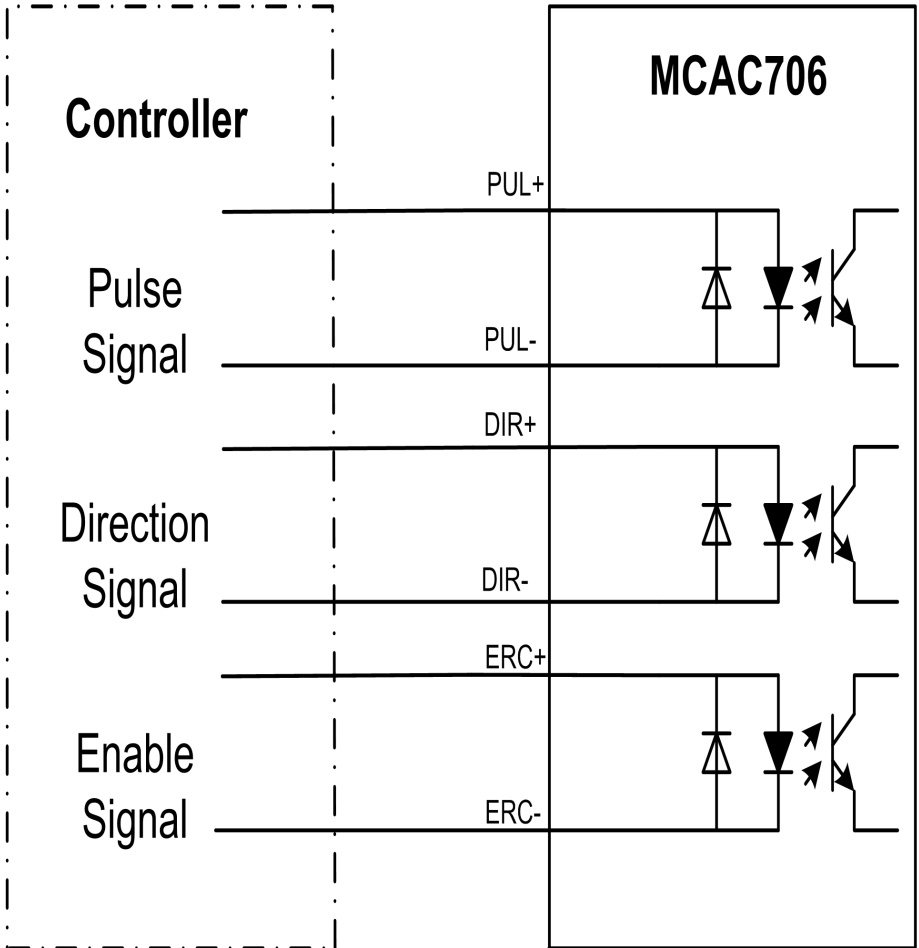
Above resistance must be connected to the control signal terminal.

6.2 Connections to Common Cathode

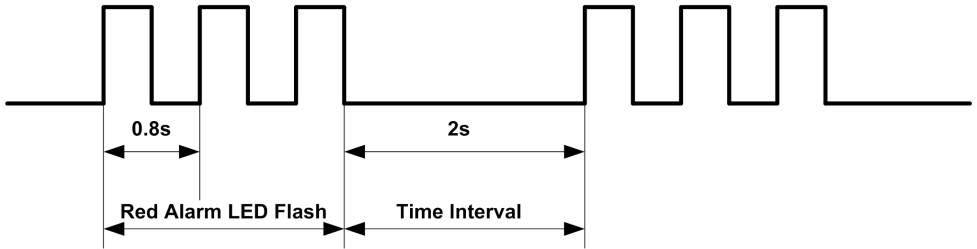


Note: When VCC is 5V, R shorted;
When VCC is 12V, R is 1K, more than 0.125W resistance;
VCC is 24V, R is 2K, 0.125W greater resistance;
Above resistance must be connected to the control signal terminal.

6.3 Connections to Differential Signal

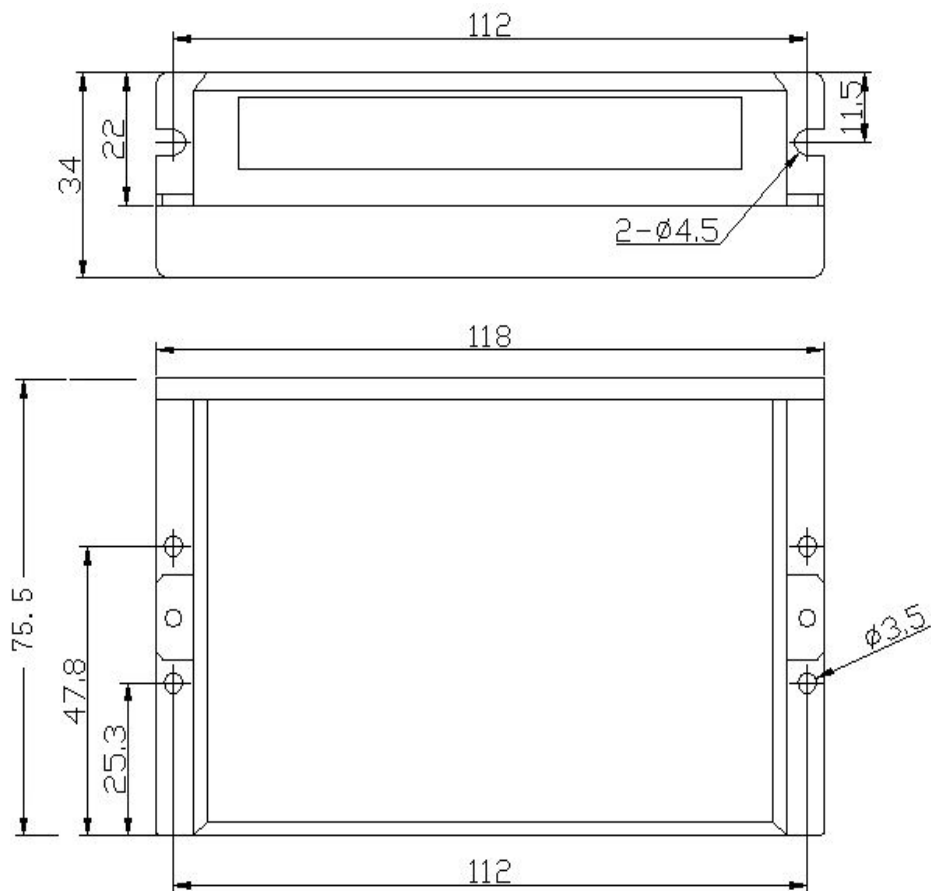


7.Error alarm and LED lamp flicker



Red light flashes	Alarm instructions
2	Drive over current
3	Driver position deviation exceeds set value
4	Driver encoder alarm
7	Driver overload

8. Dimensions

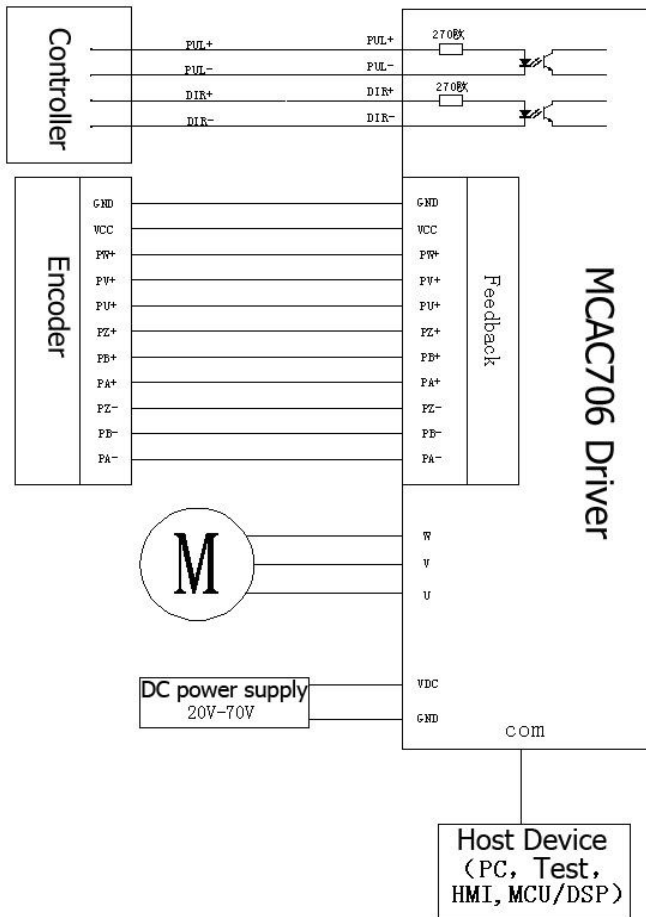


9. Connection

Typical wiring diagram servo system is as follows:

The driver can provide +5 V, maximum 80mA of power to the encoder.

Four-octave counting mode, the encoder resolution is multiplied by four the number of pulses per servo motor revolution.



10.FAQ and fault analysis

10.1 Power Led not ON

- ①Check if the power supply with input, If the wire connection is correct .
- ②If the input voltage is too low.
- ③The input voltage is too high, the servo motor to burn out.

10.2 Power on Red light alarm

- ①Servo drive motor input power voltage is too high or too low.
- ②Whether there always with pulse input or not before servo drive motor powered on.
- ③Alarm caused by the variance.

10.3 Red light alarm after run turning a small angle

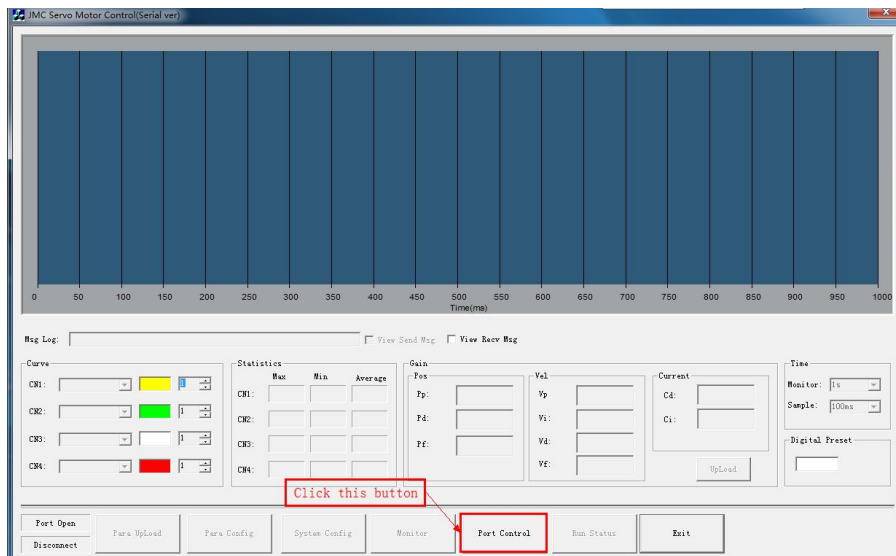
- ①In the configuration parameter of servo motor Whether Pole and line number of the motor encoder matches or not (Number of pole :4, encoder line :1000).
- ②Pulse input speed whether is larger than the rated speed of the motor position error occurred.

10.4 no rotate after the pulse input

- ①Servo - drive motor pulse input connection is reliable or not.
- ② Servo motor is Enable release or not Enable signal is input or not.
- ③Whether Electronic gear ratio setting is too large.

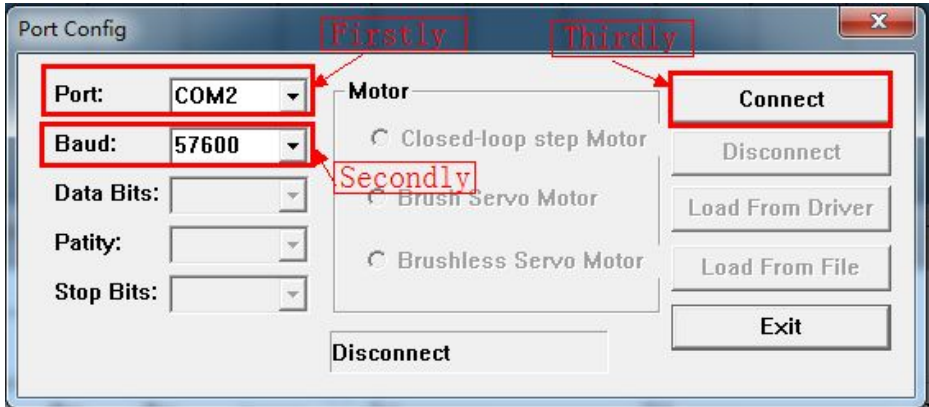
See Appendix 1 :MCAC706 Parameter modification steps

Select MCAC706 communication-specific software, double-click to open the following diagram:

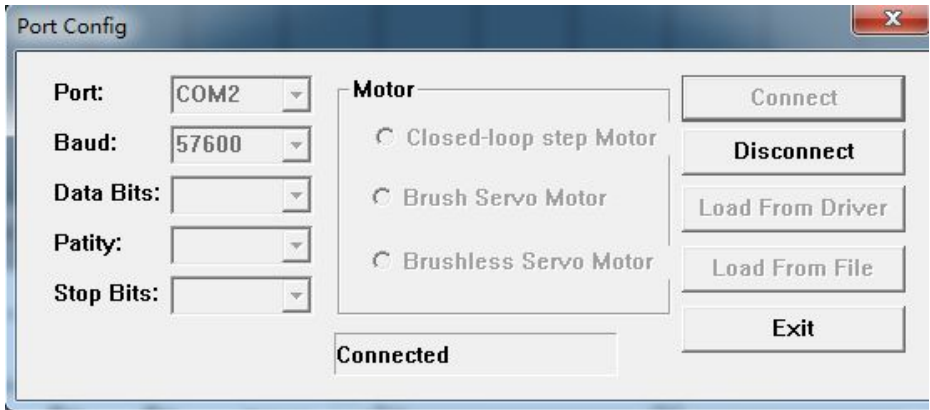


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In the dialog box, select the corresponding communication COM port, baud rate is set to 57600, in point connection operating below:

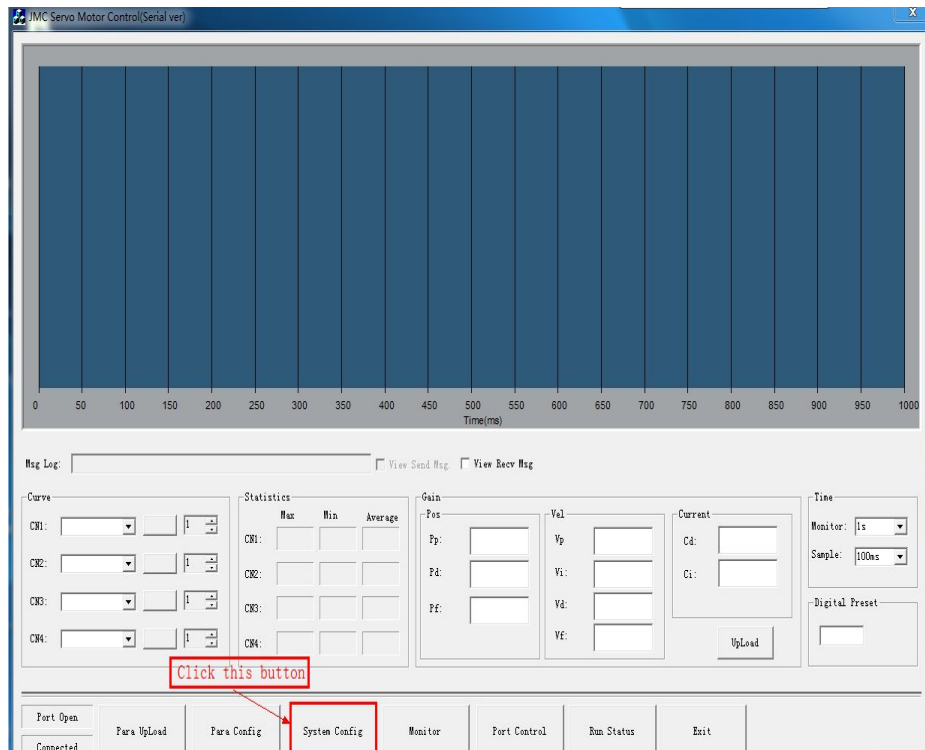


Click on the link in, there is connected shown in the dialog box below:



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If the connection is failed , make sure that the COM port is selected right, drive to work again to retry;Exit communication settings:



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Select System Settings, then data of the software is initial status, no data;

系统设置

Motor/Encoder

Line:

Motor:

Electronic gear

Molecular:

Denominator:

Control Mode

Pos Control Vel Control

Torque Control

Input

Pluse Digital Ramp enable

Singal

Pluse+Dir Pluse+CW Dir Dipulse dipulse+CW Dir

Mode 2

Servo Control: Internal Control External Control

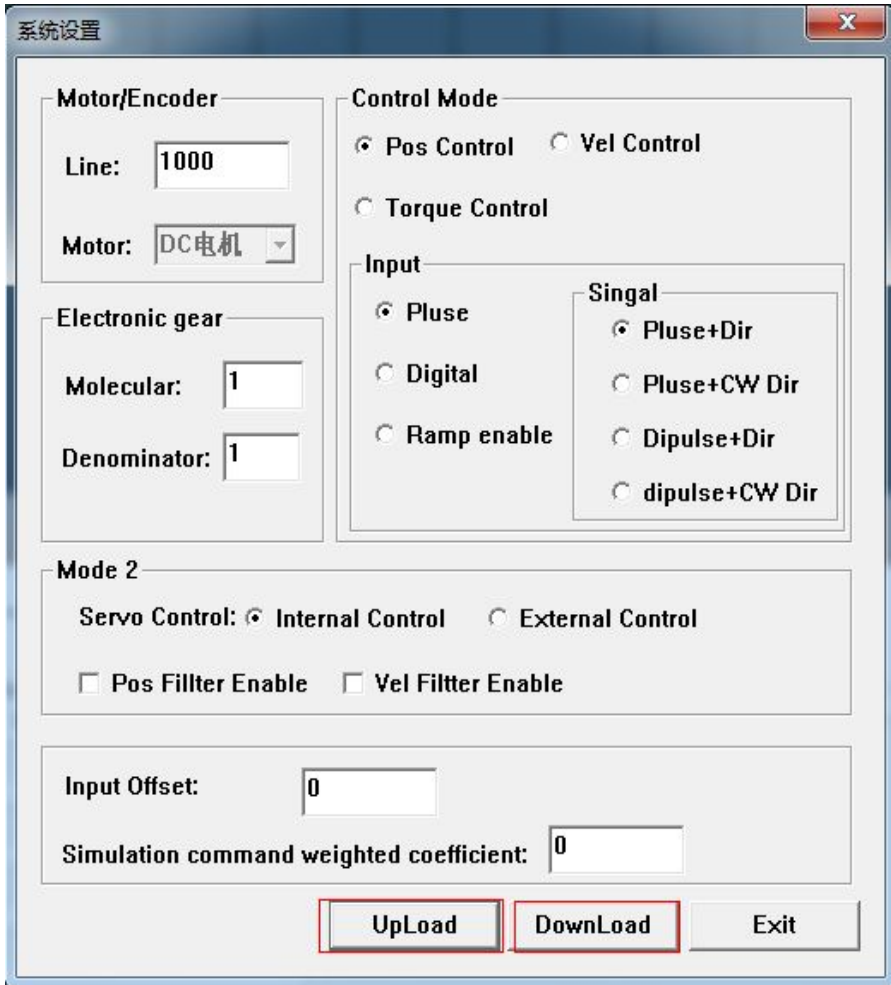
Pos Filter Enable Vel Filter Enable

Input Offset:

Simulation command weighted coefficient:

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Click Upload, you can put the drive parameters are displayed, if need a parameter, enter a value, or use the mouse to select items, click "download" button, then the parameter update to the drive, in the attempt to upload, you can check the data whether the update was successful as shown:



Parameter Config

Pos Loop | **Vel Loop** | Current Loop | Threshold setting

Vp:	6000	Continuous Vel:	0
Vi:	500	Vel Limit:	16383
Vd:	0	Acc:	255
Aff:	0	Dec:	255
Vel Filter:	7		

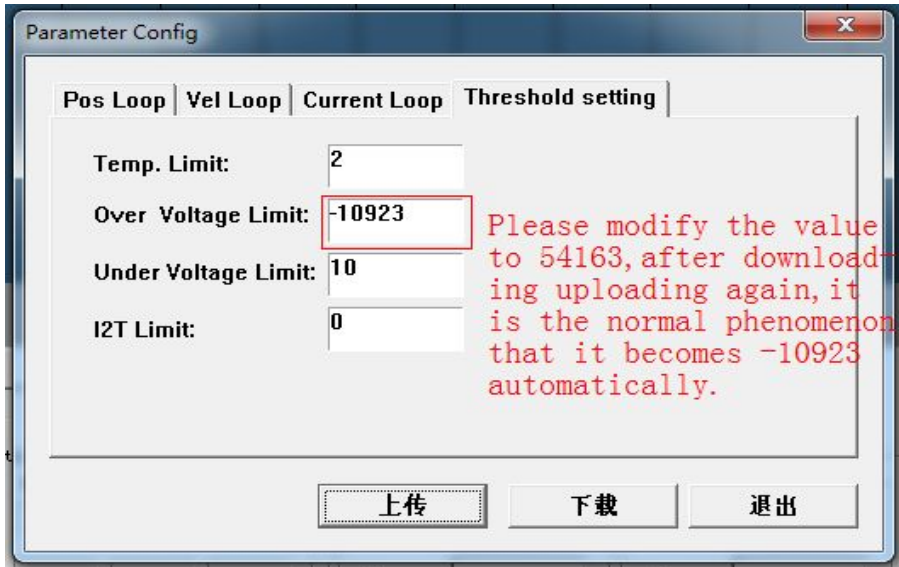
Upload Download Exit

Parameter Config

Pos Loop | Vel Loop | **Current Loop** | Threshold setting

Cp:	2000	Continuous Current:	3000
Ci:	500	Limit Current:	4000

Upload Download Exit



The above picture is only for reference, in case of doubt, please contact JMC after-sales Services!

* **Note:** The parameter may need to be increased or decreased based on the different mechanical structure.