iHSV57-XX
Integrated AC Servo Motor
USER Manual

Preface

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| Version	Edited By	Proofreaded By
V1.0	Engineer Dept.	Engineer Dept.

Content

1.Introduction

iHSV57-XX Integrated AC Servo Driving Motor is perfectly integrated AC servo drive into servo motor, adopts vector control in DSP chip, features in low cost, full closed loop, all digital, low heat, small vibration, and high response, as well as includes three adjustable feedback loop control modes(postition loop, speed loop, and current loop). iHSV57-XX is a series of stable performance, high cost-effective motion control products.

2.Features

2.1 Multi Pulse Input Modes Pulse+Direction

2.2 Opto-isolator Servo Reset Input Port ERC

2.3 Current Loop Bandwidth: (-3dB) 2KHz(Typical)

2.4 Speed Loop Bandwidth: 500Hz(Typical)

2.5 Position Loop Bandwidth: 200Hz(Typical)

2.6 Motor Quadrature Encoder Input Interface: Differential Input(26LS32)

2.7 Download parameters via RS232C from PC or Text Display.

2.8 Users can definite subdivisions via external Dial-up switches or software.

2.9 Overcurrent, I2T, Over-voltage, Undervoltage, Overheat, Overspeed, Overerror Protections.

2.10 Green light indicates running, red light indicates protection or offline.

3.Ports

3.1 ALM Signal Output Port

ALM- ⊙▥ ⟩
ALM+ ⊙▥ ⟩
PED- ⊙▥ ⟩
PED+ ⊙▥ ⟩
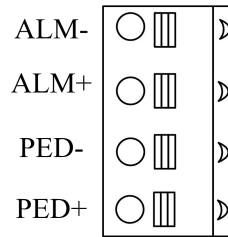
Symbol	Name	Description
ALM-	Alarm Output Negative	
ALM+	Alarm Output Positive	
PED-	Place Output Negative	
PED+	Place Output Positive	

3.2 Control Signal Output Port

ENA- ⊙▥ ⟩
ENA+ ⊙▥ ⟩
DIR- ⊙▥ ⟩
DIR+ ⊙▥ ⟩
PUL- ⊙▥ ⟩
PUL+ ⊙▥ ⟩
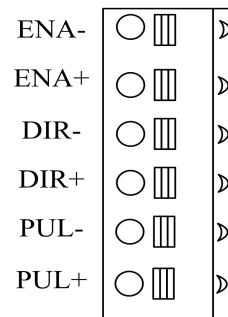
Symbol	Name	Description
ENA-	Enable Input Negative	Compatible 5V~24V level
ENA+	Enable Input Positive	
DIR-	Direction Input Negative	Compatible 5V~24V level
DIR+	Direction Input Positive	
PUL-	Pulse Input Negative	Compatible 5V~24V level
PUL+	Pulse Input Positive	

3.3 Power Port

DC+ ○▥ ⟩⟩
GND ○▥ ⟩⟩
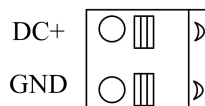
Identifier	Symbol	Name	Description
Power Supply Input	VCC	Positive Pole	20-50VDC （36V Typical）
	GND	Negative Pole	

4.The parameters of the servo system description and Settings

4.1 parameter list :

Module	Name of parameter	instructions	Factory 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	1000	1~2500
	Electronic gear ratio molecular	$G = \dfrac{molecular}{denominator}$ N：Motor rotation laps C：encoder line number P：Each lap input pulse number	1	1~32767
	Electronic gear ratio denominator	*case*：Encoder line number is 2500；Each lap input pulse number is 3200，Electronic gear ratio？ $G = \dfrac{N \times C \times 4}{P} = \dfrac{1 \times 2500 \times 4}{3200} = \dfrac{10000}{3200} = \dfrac{25}{8}$	1	1~32767
	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	External control	External control
Parameter	Position ratio	‣ Proportional gain of a set of position	2000	1000~20000

		loop regulator ‣ The larger the set value, the higher the gain, the greater the stiffness,the smaller the position lag, but the numerical value is too large ‣ In the case of no shock value as much as possible		
setting	Position feedforward	‣ 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	‣ AAdjust 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 Said 0 position deviation is not calculated,no alarm	30000	10000~ 30000
	Position differential	Default 0,no need to set	0	no need to set
	Position filter	Adjusting position loop filter coefficient	1	0~7
	Speed ratio	‣ 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	‣ 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 differential	Default 0,no need to set	0	no need to set

|				
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	‣ 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	‣ 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	‣ 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 protection threshold	System default	System default	no need to set
I2T protection threshold	System default	System default	no need to set

4.2 Parameter setting method :

See Appendix 1

5.Technical index

input voltage	24~50VDC(36V typical value)
Continuous output current	6A
Maximum pulse frequency	250K
Default rate	9.6Kbps (Required external conversion interface)
protect	▸Peak value of over current action value 30A + 10% ▸Overload I2t current action value of 300% 5S ▸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℃
	Storage temperature	−20℃~+80℃
	humidity	40~90%RH
	Cooling mode	Natural cooling or forced air cooling

6.Connections to Control Signal

6.1Connections to Common Anode
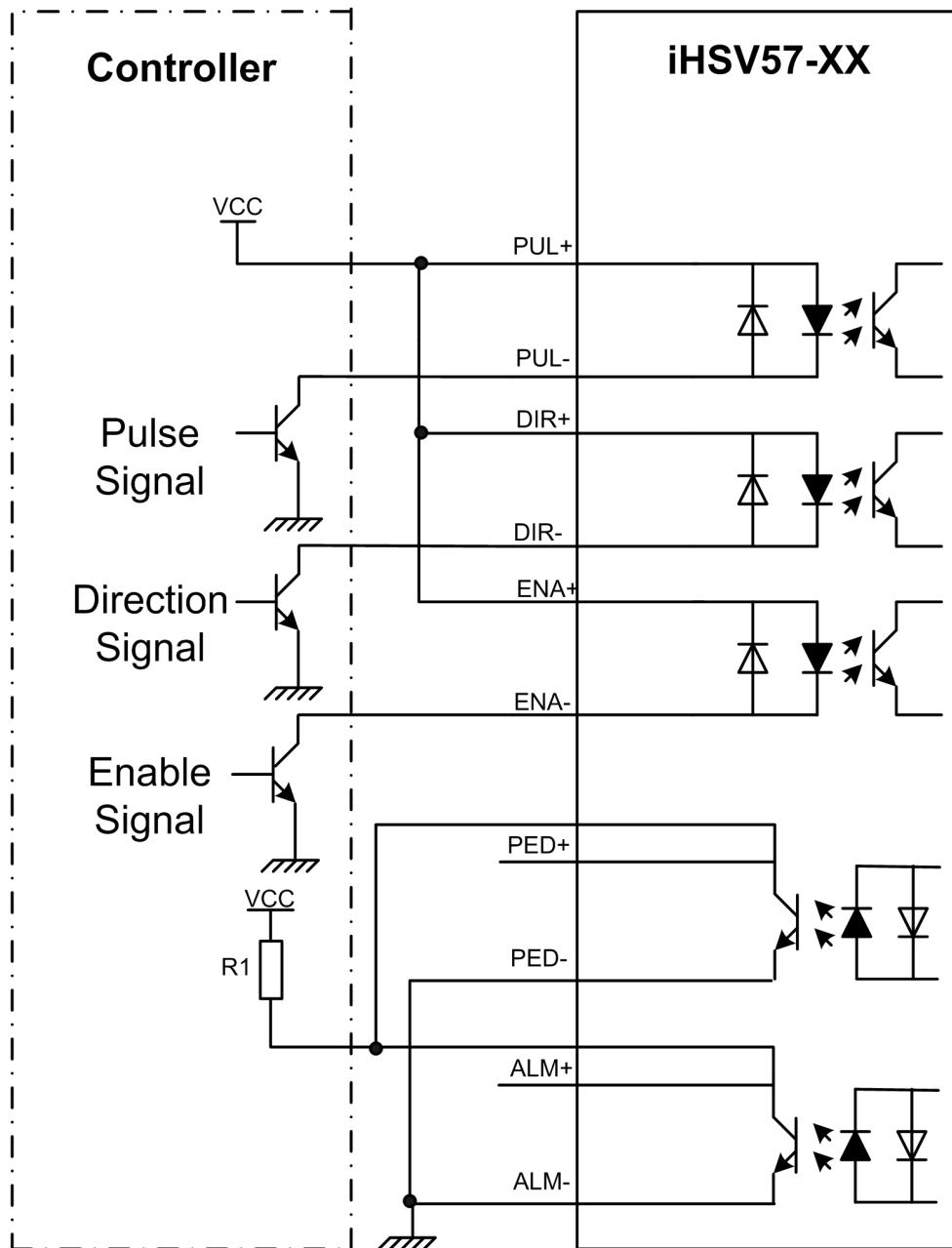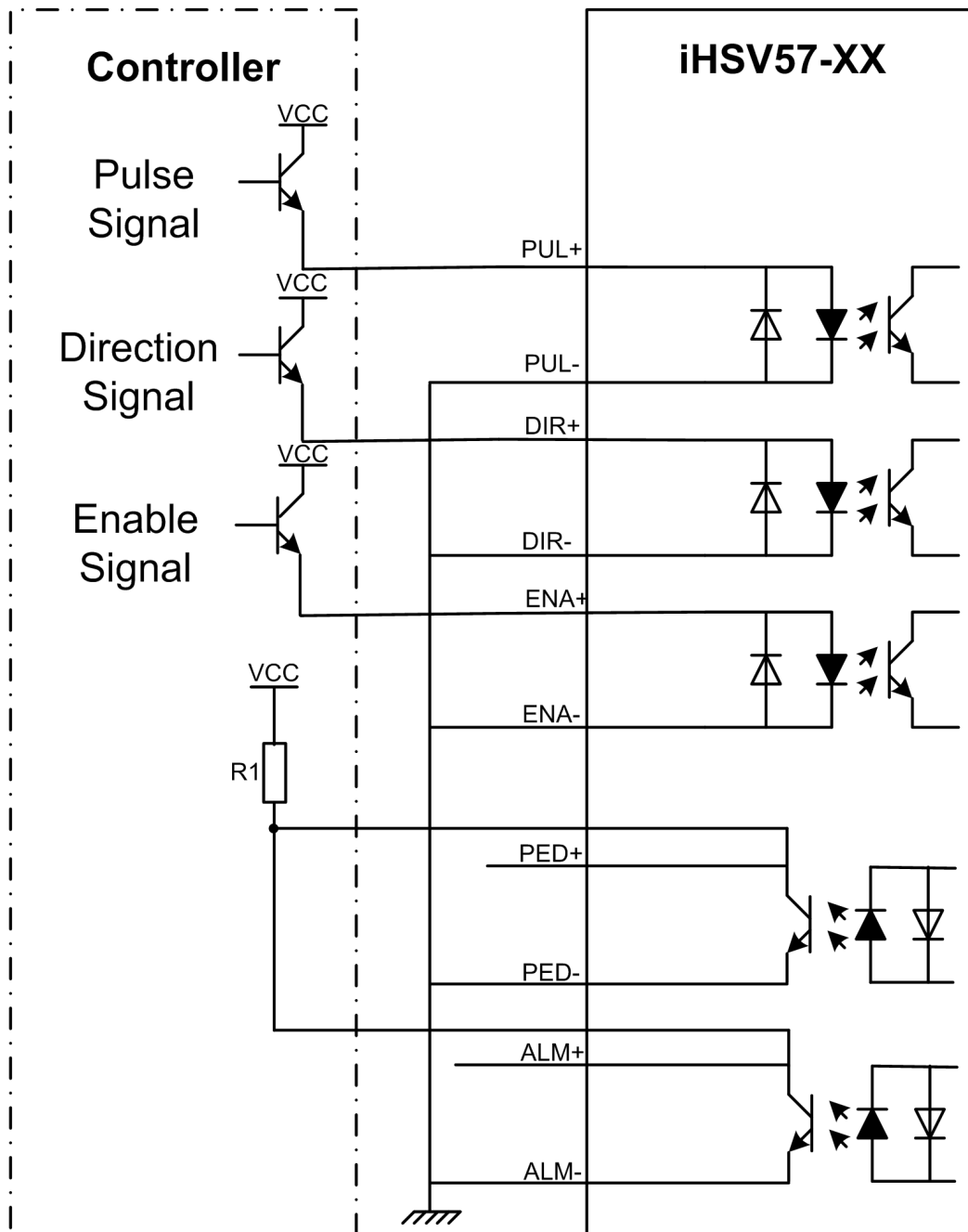

Remark:

VCC is compatible with 5V or 24V;

R(3~5K) must be connected to control signal terminal.
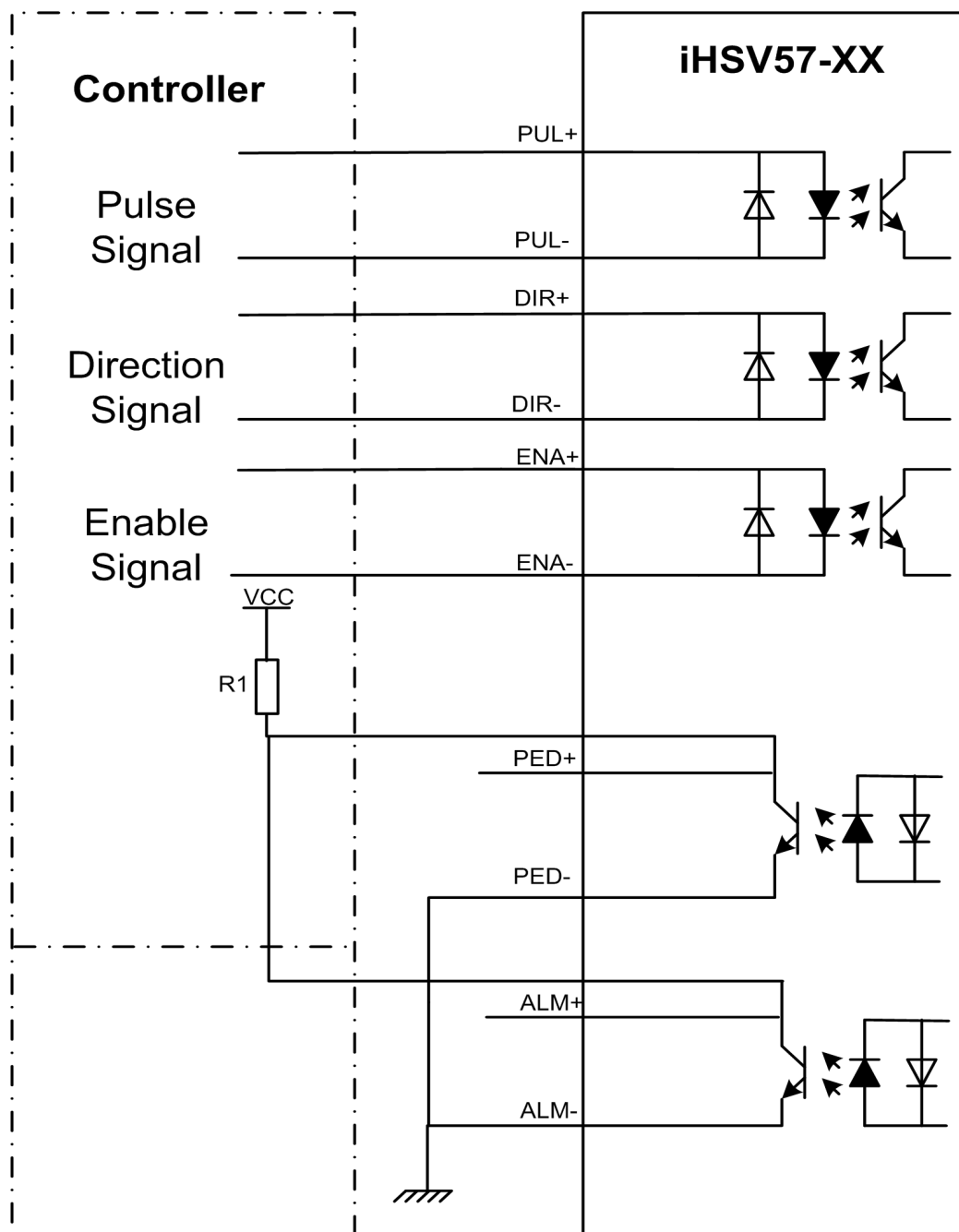
6.2 Connections to Common Cathode

Remark:

VCC is compatible with 5V or 24V;

R(3~5K) must be connected to control signal terminal.

6.3 Connections to Differential Signal

Remark:

VCC is compatible with 5V or 24V;

R(3~5K) must be connected to control signal terminal.

6.4 Connections to 232 Serial Communication Interface

NC

RX

GND

TX

VCC

Definition	Remark	color
NC	Reserved	
RX	Receive Data	Brown white
GND	Power Ground	blue
TX	Transmit Data	Blue white
VCC	Power Supply to HISU (3.3V)	

6.5 Sequence Chart of Control Signals

In order to avoid some fault operations and deviations, PUL, DIR and ENA should abide by some rules, shown as following diagram:
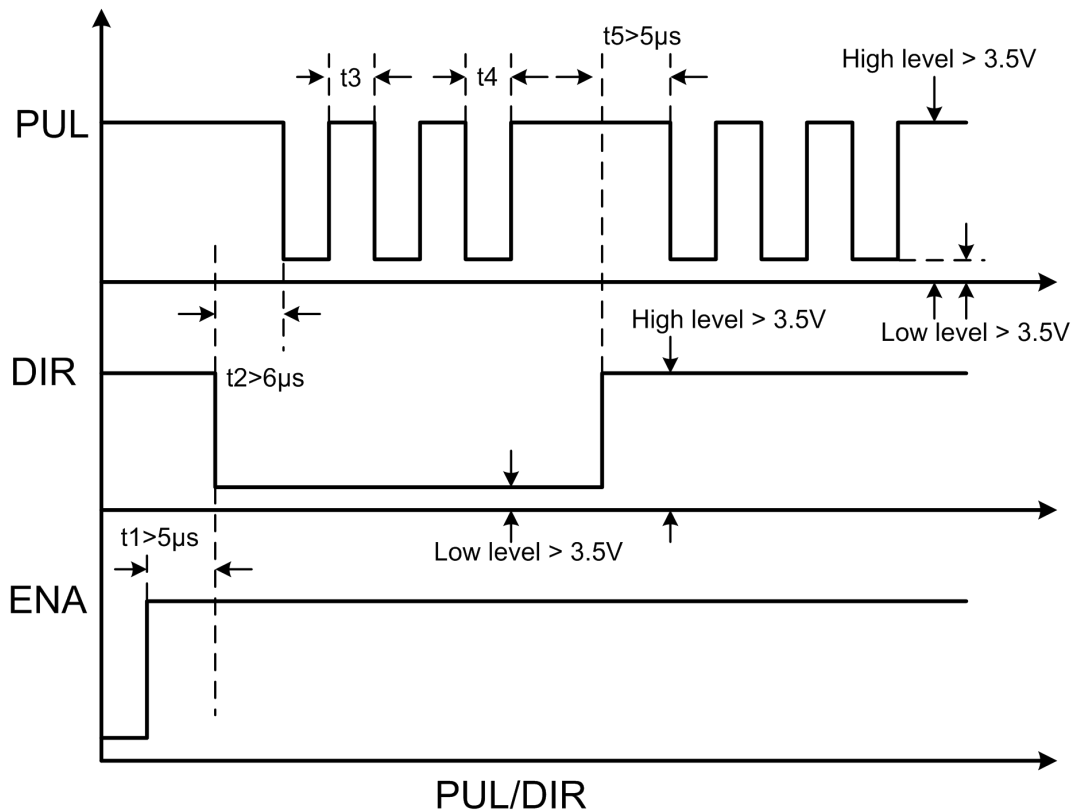
Remark：
(1) t1: ENA must be ahead of DIR by at least 5μ s. Usually, ENA+ and ENA- are NC
      (not connected).
(2) t2: DIR must be ahead of PUL active edge by 6μ s to ensure correct direction;
(3) t3: Pulse width not less than 2.5μ s;
(4) t4: Low level width not less than 2.5μ s.

7.DIP Switch Setting

7.1 Micro steps Setting

The micro steps setting is in the following table, while SW1、SW2、SW3、SW4 are all on, the internal default micro steps inside is activate, it can set by our servo software.

| Switch micstep	SW1	SW2	SW3	SW4
Default	on	on	on	on
800	off	on	on	on
1600	on	off	on	on
3200	off	off	on	on
6400	on	on	off	on
12800	off	on	off	on
25600	on	off	off	on
51200	off	off	off	on
1000	on	on	on	off
2000	off	on	on	off
4000	on	off	on	off
5000	off	off	on	off
8000	on	on	off	off
10000	off	on	off	off
20000	on	off	off	off
40000	off	off	off	off

7.2 Activate Edge Setting

SW5 is used for setting the running direction, "off" means CCW, while "on" means CW.

7.3 Running Direction Setting

SW6 is used for setting the activate edge of the input signal, "off" -means the activate edge is the rising edge, while "on" is the falling edge.

8.Error alarm and LED lamp flicker
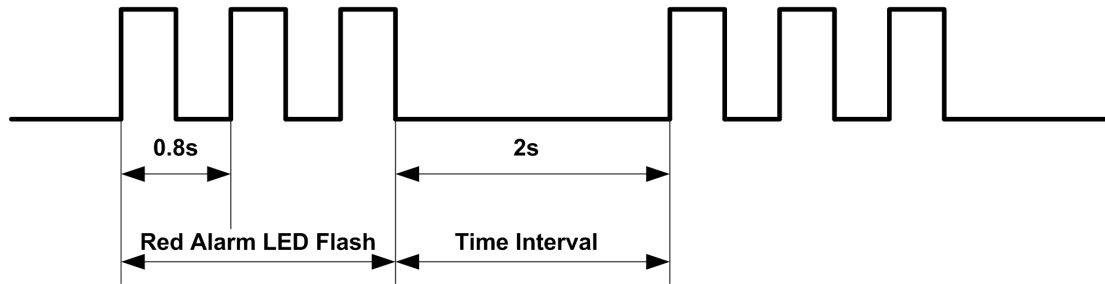
Red light flashes	Alarm instructions
2	Drive over current
3	Driver position deviation exceeds set value
4	Driver encoder alarm
7	Driver overload

9.Installation dimensions
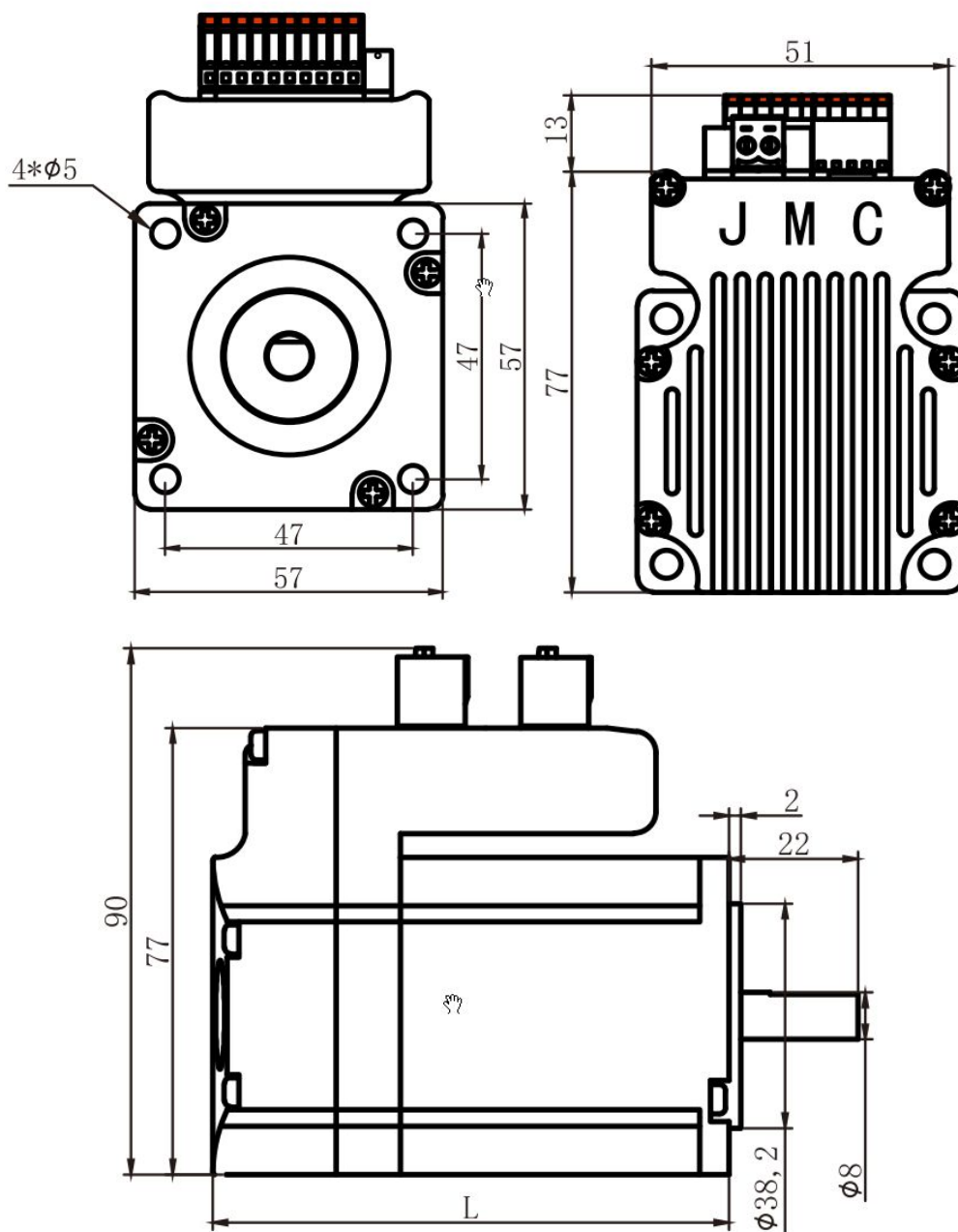
Model	Length L（mm）	Shaft length （mm）
iHSV57-30-10-36-XXX	110	30
iHSV57-36-14-36-XXX	130	
iHSV57-36-18-36-XXX	150	
iHSV57-30-10-36-21-XXX	110	21
iHSV57-30-14-36-21-XXX	130	
iHSV57-30-18-36-21-XXX	150	

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.
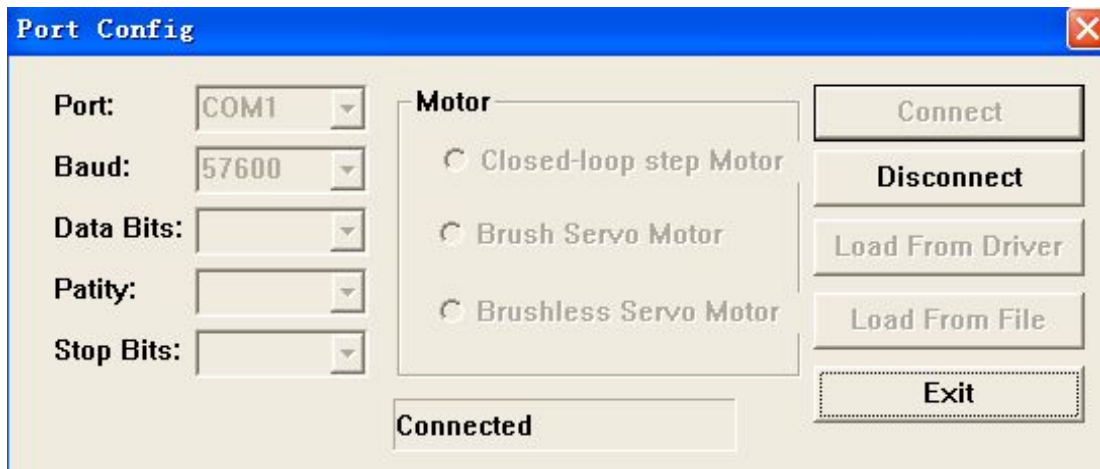
See Appendix 1 :iHSV57-XX Parameter modification steps

1、JMC servo debug software,Double - click to open the following image:
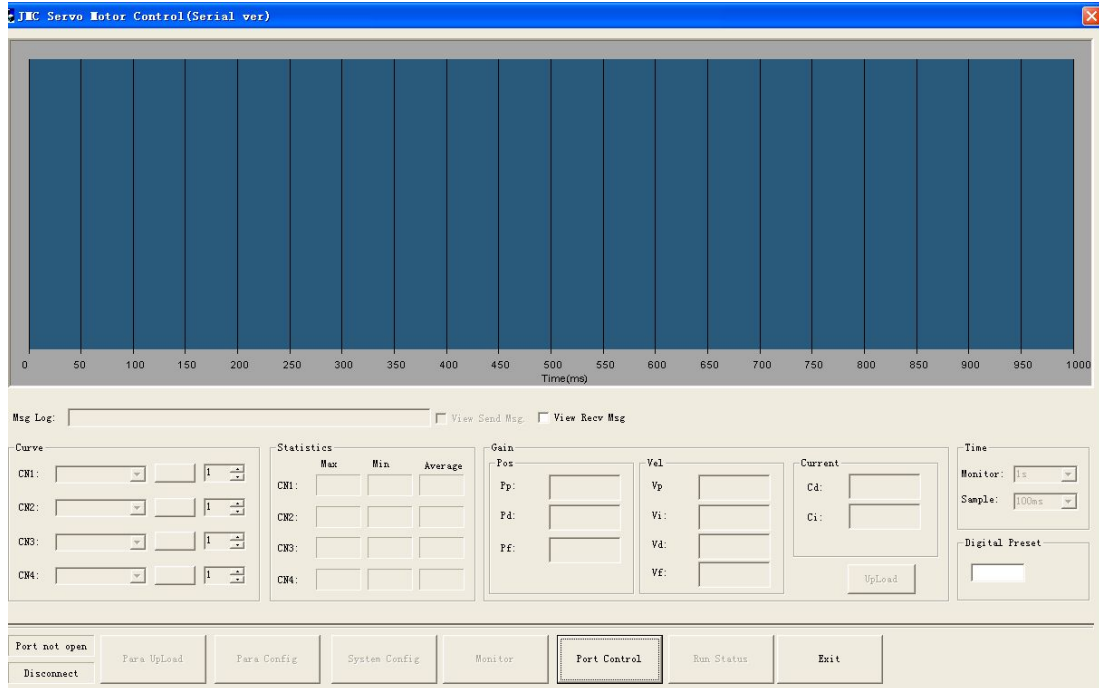

2、In the pop-up dialog box,Select the corresponding Communication COM port,baud rate set 57600,In the Connect action figure below：
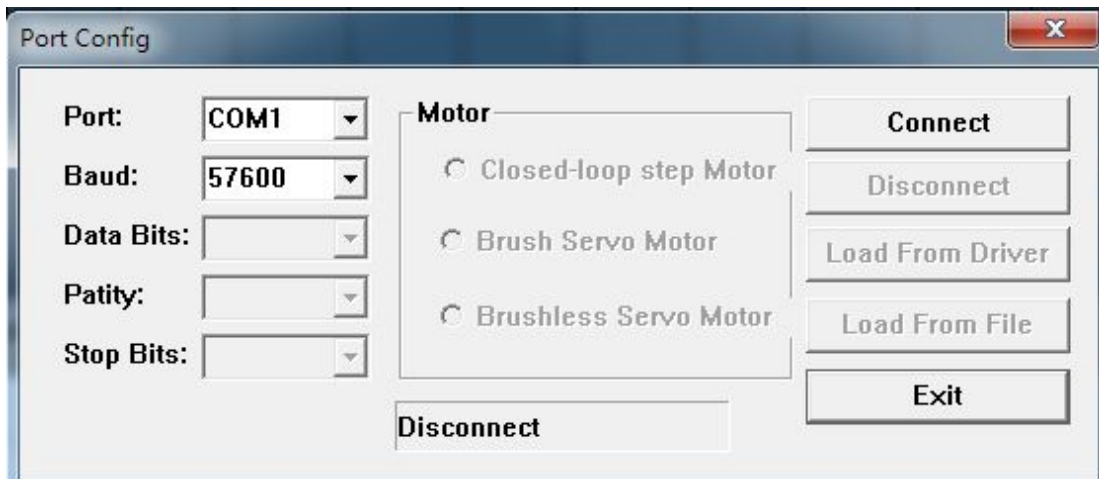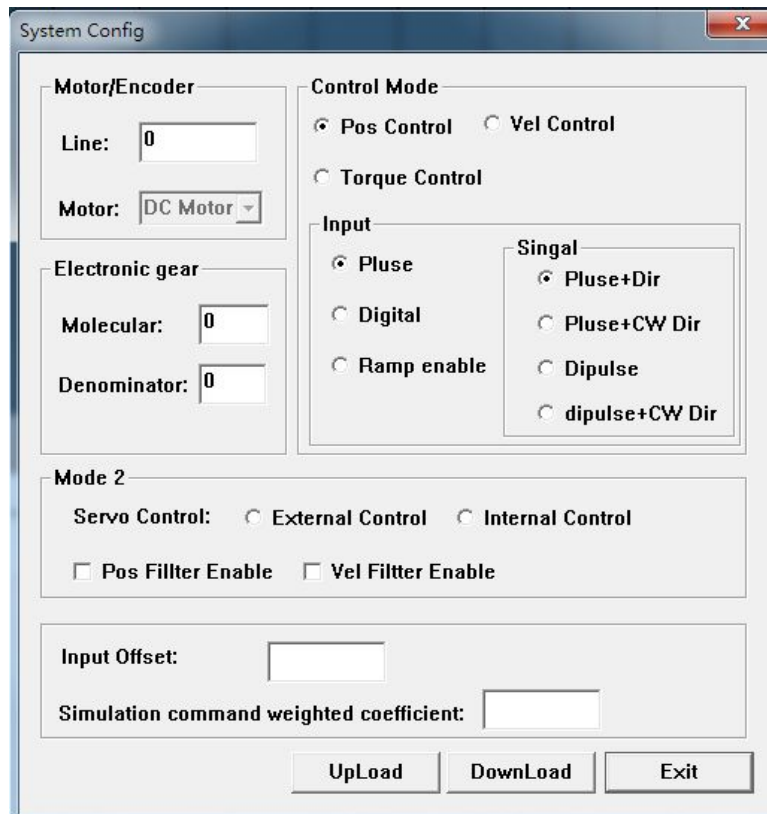
3、After click on the link,Under the connected display the dialog box below:

Note：If can not connect , pls confirm if COM select correct,Communications line connected correctly or not ,After you confirm connect again by pressing the steps above
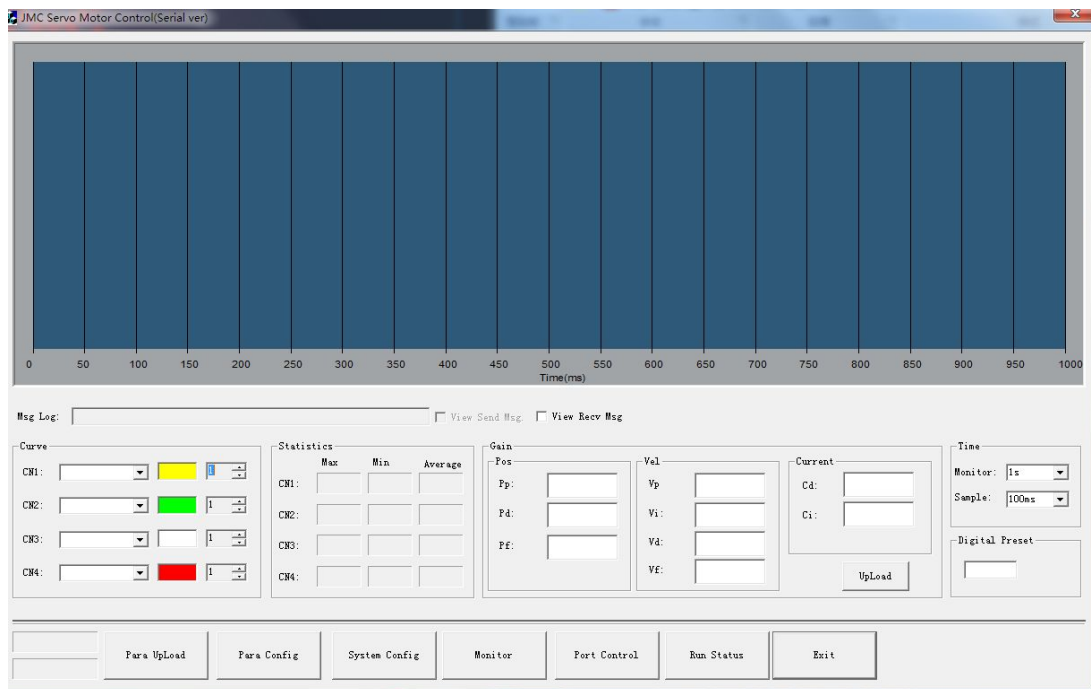

4、Click system settings,The following window pops up, the data is the starting state of the software, no data

5、Click the upload button, Drive parameters can be displayed, if need a parameter, Enter value, Or use the mouse to select items, Click the download button, The parameters update to the drive, Try to upload, whether Verifiable data is updated successfully as shown in figure :
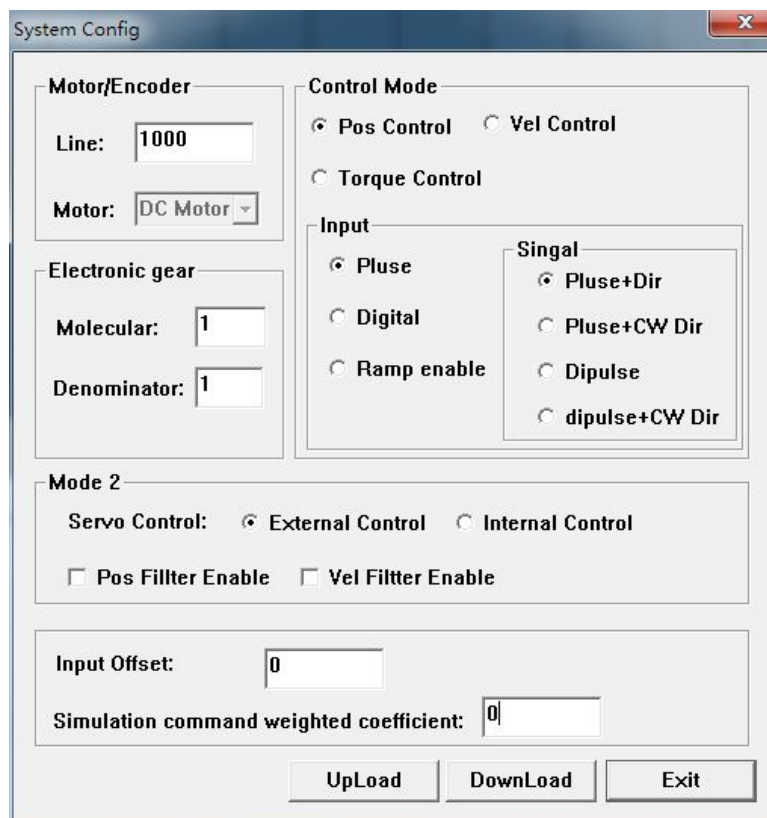
6、After modified,exit window,Then click on the parameter settings,as below pic:
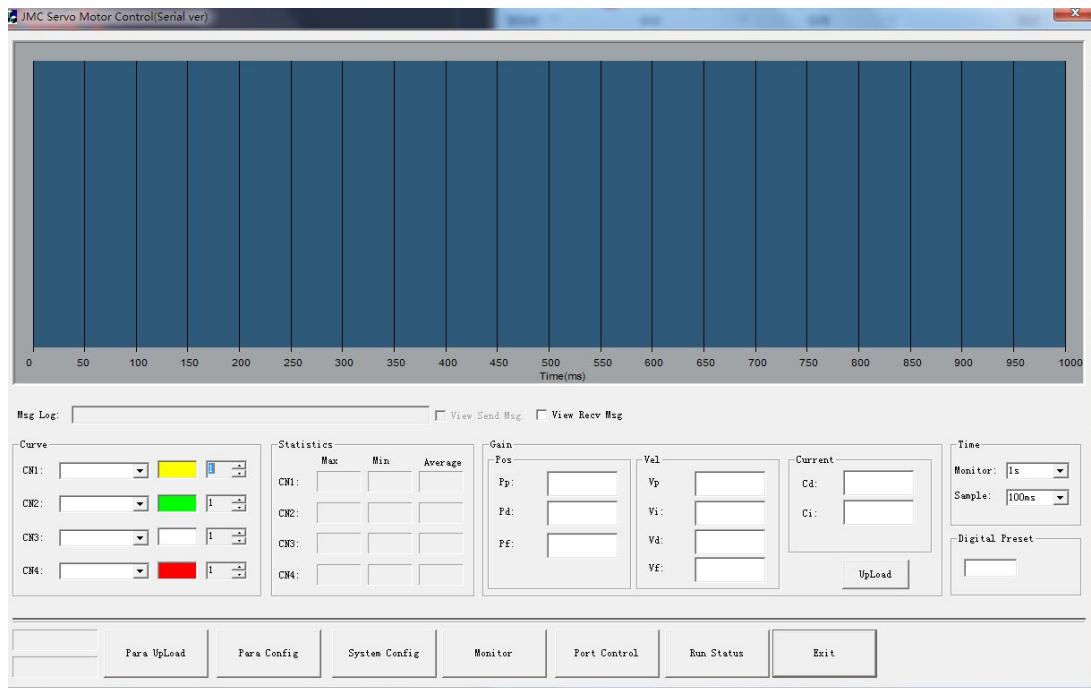
7、Parameter setting window pops up,Parameters settings upload in accordance →modify→download→Upload steps , Four items position loop,SPEED LOOP,CURRENT LOOP,Threshold settings Requires individual download ,Click download a single valid pic figure below :
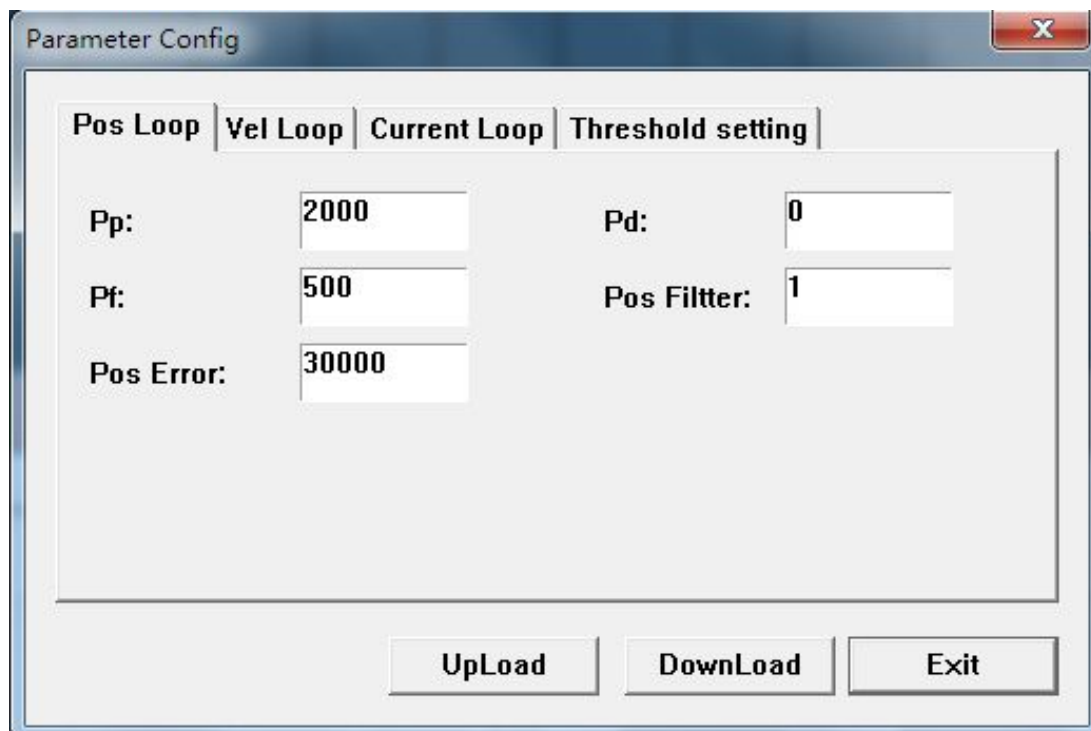
Parameter Config

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 Filtter:	7		

UpLoad   DownLoad   Exit

Parameter Config

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

Cp:	2000	Continuous Current:	6000
Ci:	500	Limit Current:	9000

UpLoad   DownLoad   Exit
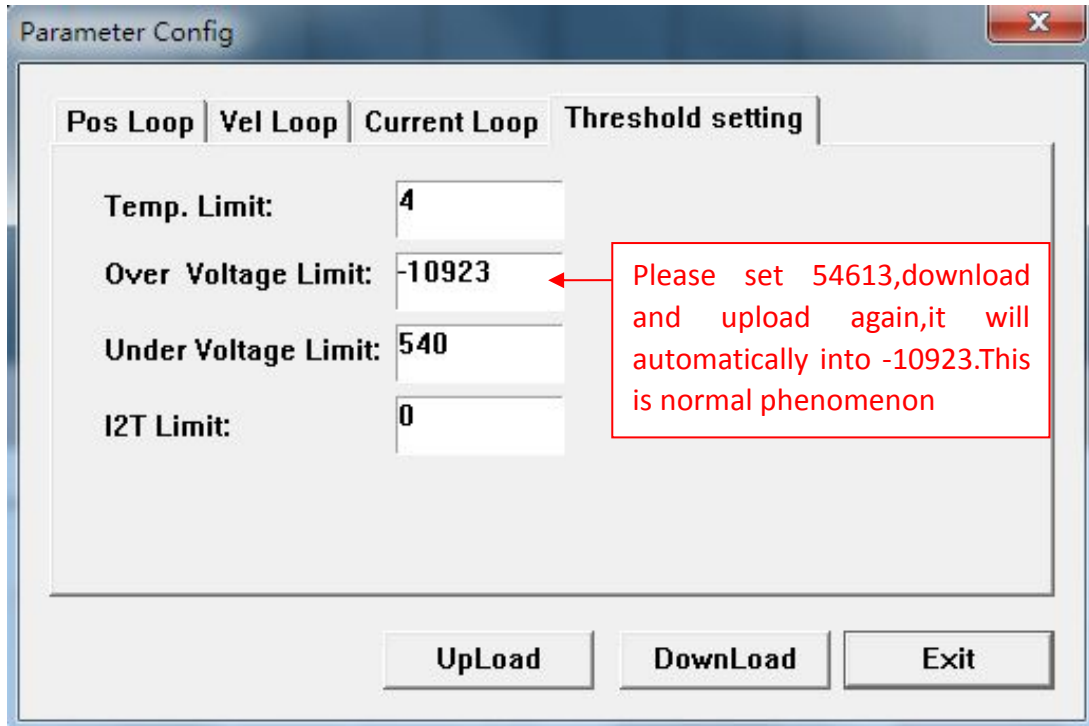
Above pictures as reference onl, if any questions, please contact with JMC Technical service Department!