杰美康机电
JUST MOTION CONTROL

IHSS57-RC
Integrated bus stepper motor hardware manual

Http: //www.jmc-motion.com

Add：Floor 2, Building A, Hongwei Industrial Zone, Sanxian Road, Bao'an District, Shenzhen

Tel：0755-26509689　26502268

Fax：0755-26509289

E-mail:info@jmc-motion.com

Shenzhen Just Motion Control Electromechanics Co., Ltd.

version	write	approval
V2.00	R & D department	R & D department

catalog

一、Product introduction

1.1 Summary

The IHSS57-RC is a new Modbus-RTU, CANopen bus-integrated stepper motor that integrates RS-485 and CAN bus communication control technology. The stepping motor driver using standard Modbus-RTU bus protocol and CANopen bus communication protocol and DS402 control algorithm, compared with the traditional combination of stepper motor drive and stepper motor with lower cost and more convenient installation, but also can effectively avoid the problem of stepping motor lose step, and effectively restrain the motor temperature rise significantly to reduce the vibration of the motor, greatly enhance the performance of high speed motor. This integrated stepper motor integrates bus communication control technology, simple wiring, no losing step, lower heat, high speed, high torque, low cost and convenient maintenance. It is a cost-effective motion control product.

1.2 Technical characteristics

- No lost step, accurate positioning
- Support standard RS-485 bus and CAN bus
- Support standard Modbus-RTU protocol and CANopen protocol
- Three control modes with position mode, velocity mode and homing

mode

- Built-in CW, CCW, SW IO input signal with 5V or 24V for the limit and homing reference
- A BREAK brake signal output signal
- RJ45 standard network connection from the slave through the twisted pair cable can be connected
- The transmission frequency is most supported by 1Mbps, and the transmission distance is the farthest up to 1KM
- 100% rated torque drive motor
- Variable current control technology, high current efficiency
- Small vibration and smooth running at low speed
- Built-in acceleration and deceleration control to improve start and stop smoothness
- Users can define their own subdivisions
- Compatible 1000 - wire and 2500 - wire encoders
- General application parameters do not need to be adjusted
- Loss phase protection, over current protection, over voltage protection and over position error protection

1.3 Application area

For a variety of torque requirements of the larger point-to-point control of automation equipment and instruments, For example: stripping

machine, marking machine, cutting machine, laser Phototypesetting, plotter, CNC machine tools, logistics warehousing equipment, new energy lithium battery equipment, automatic assembly equipment etc.. It has excellent application effect in the user expected bus control, small noise, high speed equipment.

二、Technical indicators

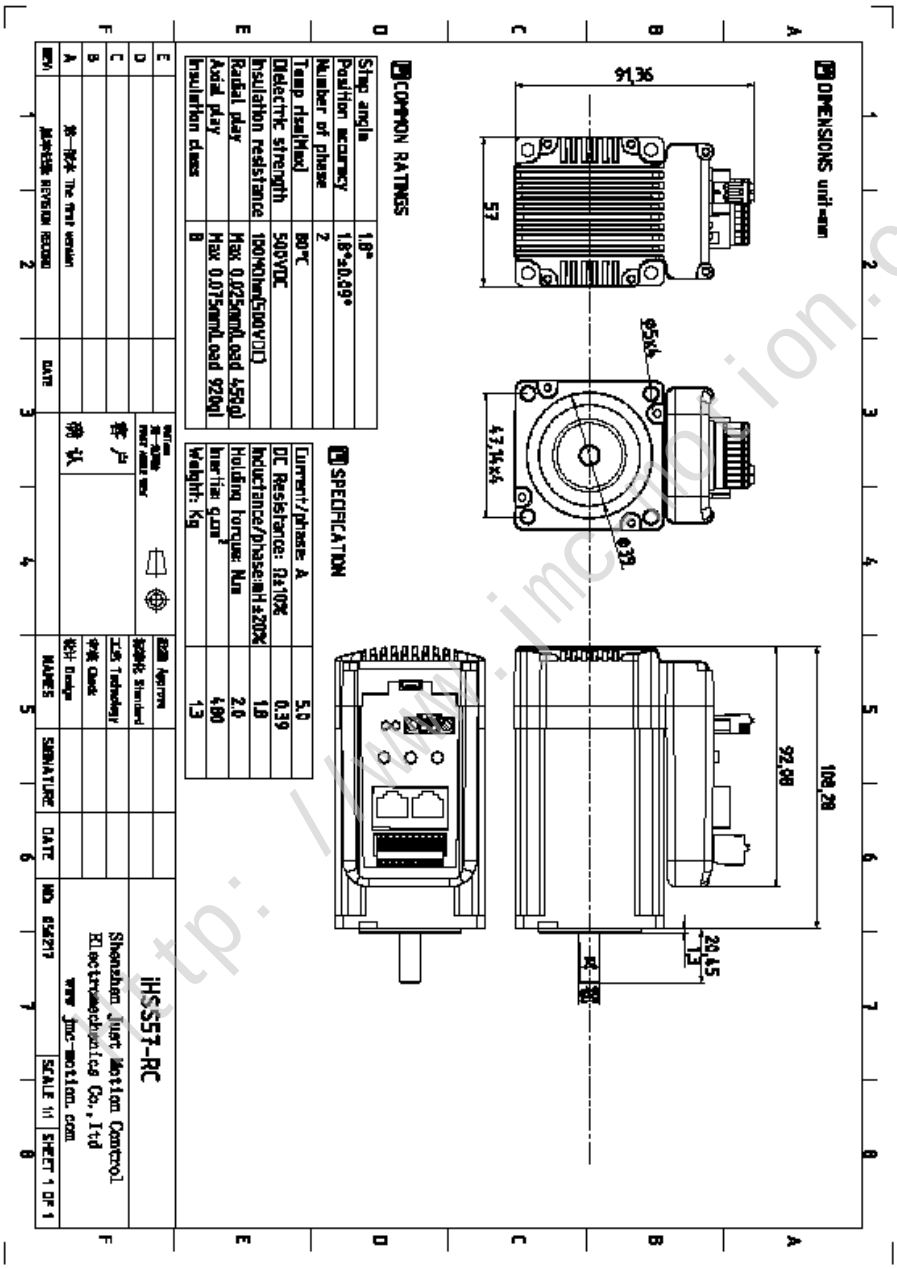
2.1 Electrical, mechanical and environmental indicators

Input voltage		24~50VDC
Continuous current output		4.0A
Communication type		RS-485 bus communication / CANopen bus communication
Maximum communication distance		RS-485 communication: 1.2KM CAN bus communication: 1KM
Maximum support from slave number		RS-485 communication: 32 CAN bus communication: 128
Maximum communication rate		RS-485 communication: 115200bps CAN bus communication: 1Mbps
Logic input current		7~20mA (10mA typical value)
Protect		▌The peak of over current action value is 12A + 10% ▌Over voltage action value 200VDC ▌The error alarm threshold can be set by the front panel of the driver or by the handheld intelligent debugger
Shape size （mm）		128×91×56
Weight		About 1500g
Use of the environment	Occasion	Avoid dust, oil mist and corrosive gas as far as possible
	Working temperature	Maximum 70℃
	Storage temperature	-20℃~+80℃
	Humidity	40~90%RH
	Cooling mode	Natural cooling or forced cold wind

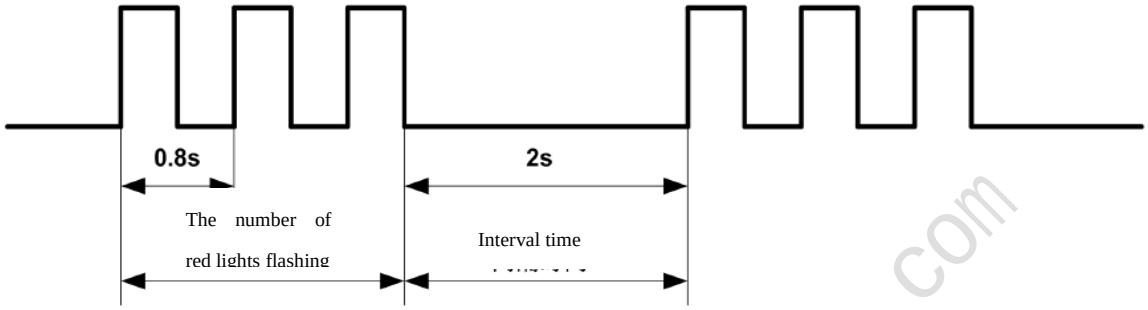
2.2 Mechanical installation size diagram

For the detailed installation of the size chart, see the PDF appendix named "iHSS57-RC size chart".

The sketch is as follows:



三、Error alarm and the number of LED lights flashing



Red light scintillation number	Alarm description
Red LED extinguish,	Drive CAN communication
green light flicker	unlinked
Red extinguish, ever green	Drive normal power up
The red light flashes one time and the green light is on.	Drive over current
The red light flashes two times and the green light is on.	Driver parameter upload error
The red light flashes three times and the green light is on.	Drive power supply exceeds maximum
The red light flashes four times and the green light is on.	Drive over position error
The red light flashes five times and the green light is on.	Driver communication error

The red light flashes six times and the green light is on.	CCW direction limit
The red light flashes seven times and the green light is on.	CW direction limit
The red light flashes eight times and the green light is on.	SW direction limit
The red light flashes nine times and the green light is on.	Drive overheating
The red light flashes ten times and the green light is on.	Loss phase alarm

四、Introduction of driver interface and connection

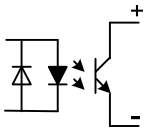
4.1 Interface definition

4.1.1 Power port

Port number	Symbol	Name	Explain

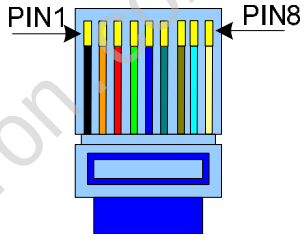
1	DC+	Power input positive pole	+DC range is in 20~50V
2	GNG	Power input ground pole	

4.1.2 Control signal port（10 pin）

Port number	Symbol	Name	Explain
1	CW+	CW limit positive	Compatible 5V and 24V
2	CW-	CW limit negative	
3	SW+	Mechanical origin limit positive	Compatible 5V and 24V
4	SW -	Mechanical origin limit negative	
5	CCW+	CCW limit positive	Compatible 5V and 24V
5	CCW -	CCW limit negative	
7	PE+	NC	
8	PE -	NC	
9	BRAKE+	Brake signal positive	
10	BRAKE-	Brake signal negative	

4.1.3 Communication Port

485 and CAN bus share the communication interface pinout definition as shown below:

Port number	Signal	Name	Illustration
1	CANH	CAN H signal	
2	CANL	CAN L signal	
3	GND	CAN ground line	
4	GND	485 ground line	
5	485A	485 A port	
6	485B	485 B port	
7、8	NC	Empty port	

4.2 Control signal interface circuit diagram

Control signal input and output interface circuit diagram, As shown in the picture:

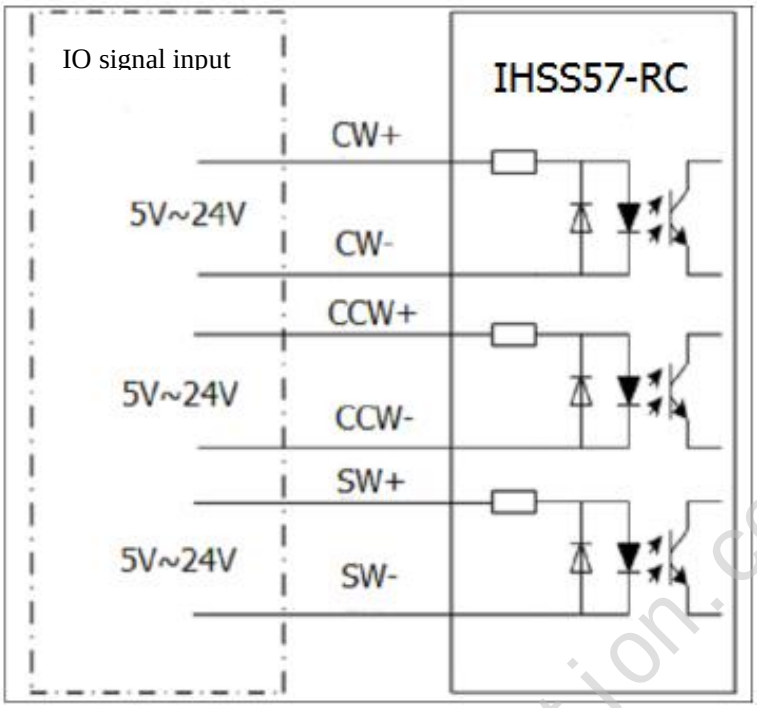


Figure 2 IO differential signal connection

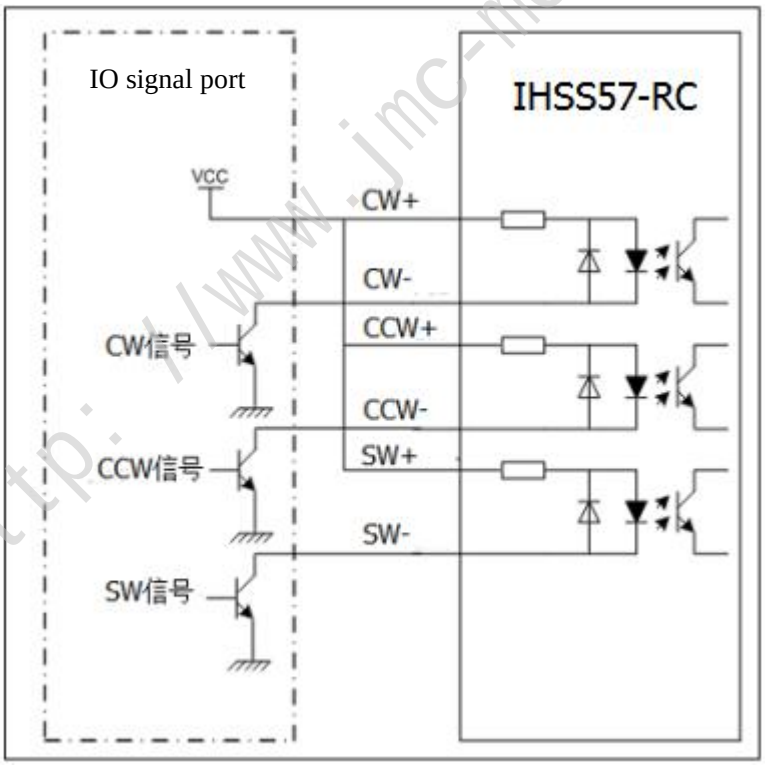


Figure 3 Common anodic bonding

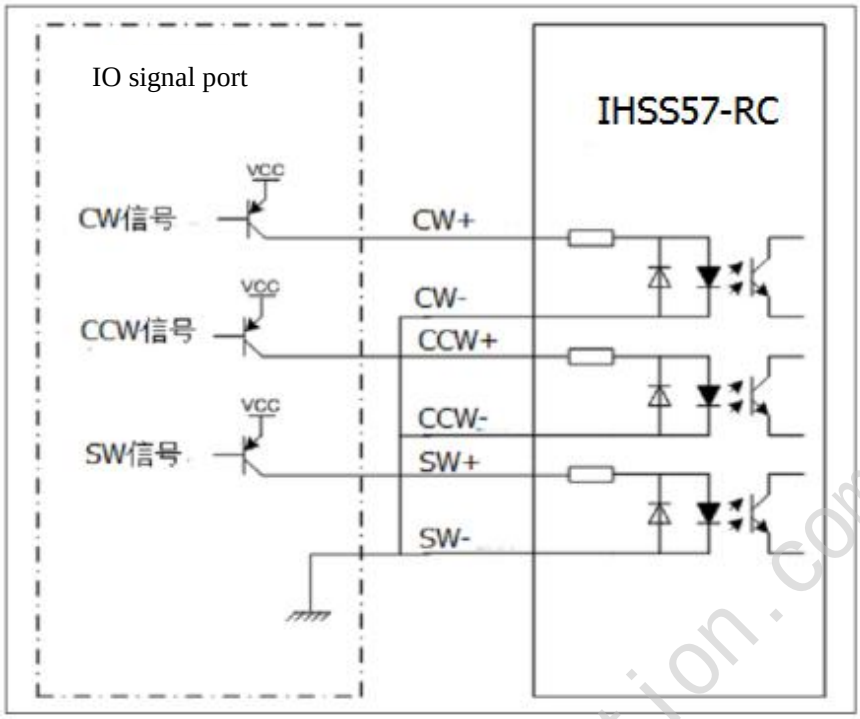


Figure 4 Common cathodic bonding

Attention ： The control signal level can be compatible with 5 V and 24V.

4.3 Serial port wiring diagram.

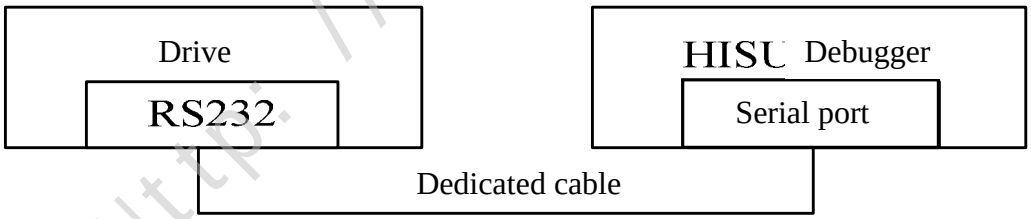


Figure 5 Schematic diagram of parameter debugging connection

Attention ： The cable connected by the IHSS57-RC and the HISU debugger must be a special cable. Please confirm the cable before use to avoid damage.

4.4 RS-485 Bus network wiring diagram

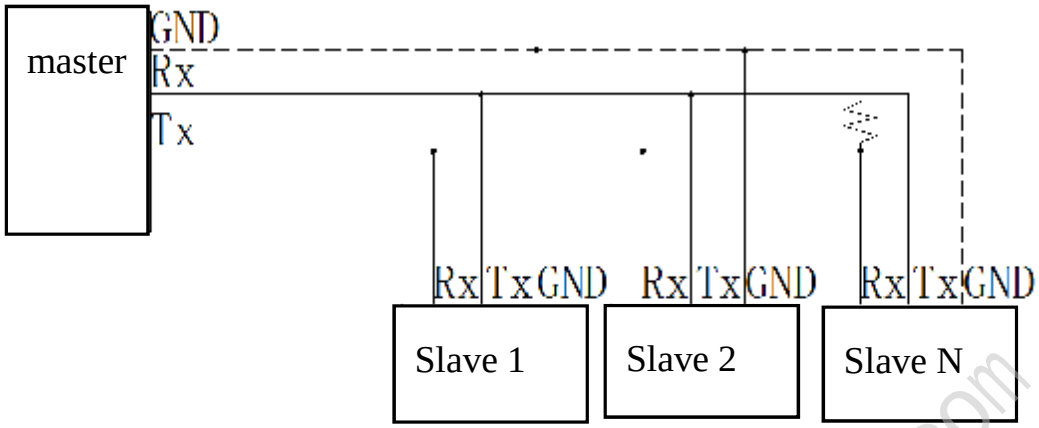


Figure 6 Bus network wiring diagram

4.5 CAN Bus network wiring diagram

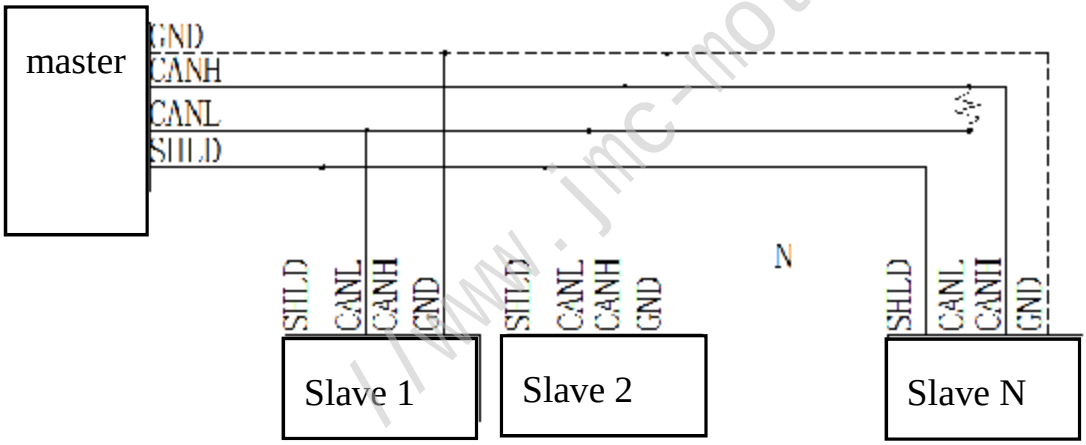


Figure 7 Bus network wiring diagram

五、Drive parameter settings

The parameter setting method of the IHSS57-RC driver: through the RS232 serial communication port of the HISU debugger, the parameter setting is completed by the special debugging software. There is a set of corresponding default factory configuration parameters for the motor. The user only needs to adjust the internal subdivision of the driver according to the specific usage. The specific parameters and functions are listed below:

The actual value =Set value×Corresponding dimension

number	Name	Range	Dimension	Restart drive	Default value
P1	**Current loop Kp**	**0—4000**	**1**	**No**	**1000**
P2	**Current loop Ki**	**0—1000**	**1**	**No**	**100**
P3	**Damping coefficient**	**0—500**	**1**	**No**	**250**
P4	**Position loop Kp**	**0—3000**	**1**	**No**	**2000**
P5	**Position loop Ki**	**0—1000**	**1**	**No**	**200**
P6	**Speed loop Kp**	**0—3000**	**1**	**No**	**500**
P7	**Speed loop Ki**	**0—1000**	**1**	**No**	**1000**
P8	**open loop current**	**0—60**	**0.1**	**No**	**25**
P9	**close loop current**	**0—40**	**0.1**	**No**	**10**
P10	**Drive alarm level**	**0—1**	**1**	**No**	**0**
P11	**Drive direction level**	**0—1**	**1**	**No**	**1**
P12	**Drive edge selection**	**0—1**	**1**	**No**	**1**
P13	**Drive enabled level**	**0—1**	**1**	**No**	**0**
P14	**Drive arrival level**	**0—1**	**1**	**No**	**0**
P15	**Encoder wire number selection**	**0—1**	**1**	**Yes**	**0**
P16	**Position error limit**	**0—3000**	**10**	**No**	**400**
P17	**subdivision selection**	**0—15**	**1**	**Yes**	**2**
P19	**Drive instruction smoothness**	**0—10**	**0**	**No**	**2**

P20	**User define subdivision**	**4—1000**	**50**	**Yes**	**8**
P21	**Factory parameters**	**Reserve**	**Reserve**	**Reserve**	**Reserve**
P22	**Factory parameters**	**Reserve**	**Reserve**	**Reserve**	**Reserve**
P23	**Factory parameters**	**Reserve**	**Reserve**	**Reserve**	**Reserve**
P24	**Factory parameter**	**Reserve**	**Reserve**	**Reserve**	**Reserve**
P25	**Open closed loop superposition ratio**	**0—40**	**1**	**No**	**10**
P26	**Drive stop damping**	**0—500**	**1**	**No**	**200**
P27	**Drive low speed damping**	**0—500**	**1**	**No**	**50**
P28	**Factory parameter**	**Reserve**	**Reserve**	**Reserve**	**Reserve**
P29	**Factory parameter**	**Reserve**	**Reserve**	**Reserve**	**Reserve**
P30	**Driver loss phase detection**	**0—1**	**1**	**Yes**	**1**
P31	**Factory parameter**	**Reserve**	**Reserve**	**Reserve**	**Reserve**
P32	**Factory parameter**	**Reserve**	**Reserve**	**Reserve**	**Reserve**
P33	**Factory parameter**	**Reserve**	**Reserve**	**Reserve**	**Reserve**
P34	**Factory parameter**	**Reserve**	**Reserve**	**Reserve**	**Reserve**
P35	**Factory parameter**	**Reserve**	**Reserve**	**Reserve**	**Reserve**
P36	**Drive alarm history 1**				
P37	**Drive alarm history 2**				
P38	**Drive alarm history 3**				
P39	**Drive alarm history 4**	**0**			
P40	**Factory parameter**	**Reserve**	**Reserve**	**Reserve**	**Reserve**
P41	**Factory parameter**	**Reserve**	**Reserve**	**Reserve**	**Reserve**
P42	**IO signal polarity selection**	**0—1**	**1**	**Yes**	**1**
P43	**Communication options**	**0—1**	**1**	**Yes**	**1**

There are 43 parameter settings that can be downloaded into the drive through HISU. The setting of each parameter is explained below:

† Parameters P1, P2, P3, P4, P5, P6, P7 are respectively used to set the parameters of the current loop, system damping, position loop, and speed loop.

† Parameters P8, P9 are used to set open loop current and close loop control current.(Actual current= Open loop current + Closed loop current)

† The parameter P10 is used for the alarm output level selection. The parameter 0 indicates the normal working time and the output triode cut-off. The driver alarm time is coupled to the output transistor.

Vice versa.

† The parameter P11 is used for direction level selection, and the control direction of the control terminal level can be changed through the setting of this parameter.

† The parameter P12 is used to select the trigger edge of the pulse, 0 is the drop edge trigger, and the 1 is the rising edge triggering.

† Parameter P13, which is used to make the level of the enable signal, generally choose 0, low level to enable, that is, without the external connection to the input signal. Vice versa.

† Parameter P14, select the arrival output level, 0 indicates that the driver meets the location condition, and the output transistor is cut off. When the condition is not satisfied, the output transistor is connected. Vice versa.

† Parameter P15, the number wire selection of the encoder, 0 for 1000 lines, and 1 for the 2500 line.

† Parameter P16, setting the threshold of the error of the position. (actual value = set value * 10)

† Parameter P17, the subdivision of the drive

Parameter	**0**	**1**	**2**	**3**	**4**	**5**	**6**	**7**

Subdivide number	Custom subdivision	800	1600	3200	6400	12800	25600	51200
parameter	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**
Subdivide number	1000	2000	4000	5000	8000	10000	20000	40000

Tip: the additional drive also provides the user with an arbitrary subdivision that can be set freely, and the specific parameters are set by mode P20.

† Parameter P19, instruction smoothness coefficient

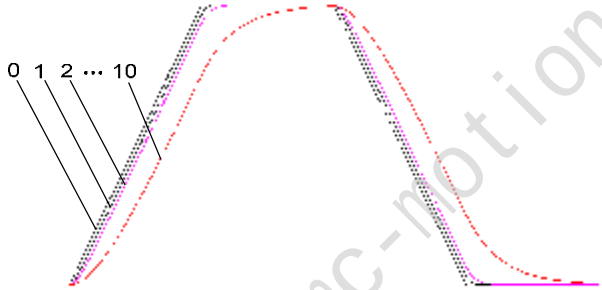


Figure 8 Instruction smoothness coefficient

† Parameter P20, which is used for user - defined subdivision.

† Parameter P30, loss phase detection, 1 is open, and 0 is closed. It is limited to the maintenance of the factory.

† Parameter P42, IO input signal polarity selection, P42=0: use PNP type limit switch; P42=1: use NPN type limit switch.

† Parameter P43, communication mode selection, P43=0: select 485 communication, P43=1: select CANopen communication.

六、Dialing switch setting

6.1 Baud rate setting

The baud rate set for the CANopen communication and the RS-485 serial communication are set by the spin switch BD, which is set as follows:

S3 Spin code value	CANopen baud rate（bps）	RS-485 Serial port baud rate（bps）
0	12.5k	1200
1	20K	2400
2	50K	4800
3	100K	9600
4	125K	19200
5	250K	38400
6	500K	57600
7	1M	115200

6.2 Station number setting

The salve number is set up by the combination of sub and parent spin code, in which the S1 is a sub-spin code and the S2 is the parent spin code.

slave number = S2*16+S1

七、Typical application wiring diagram

A typical connection diagram made up of a IHSS57-RC drive, as shown in Figure 9. The power supply selects DC20~50V according to the voltage level of the matched motor.

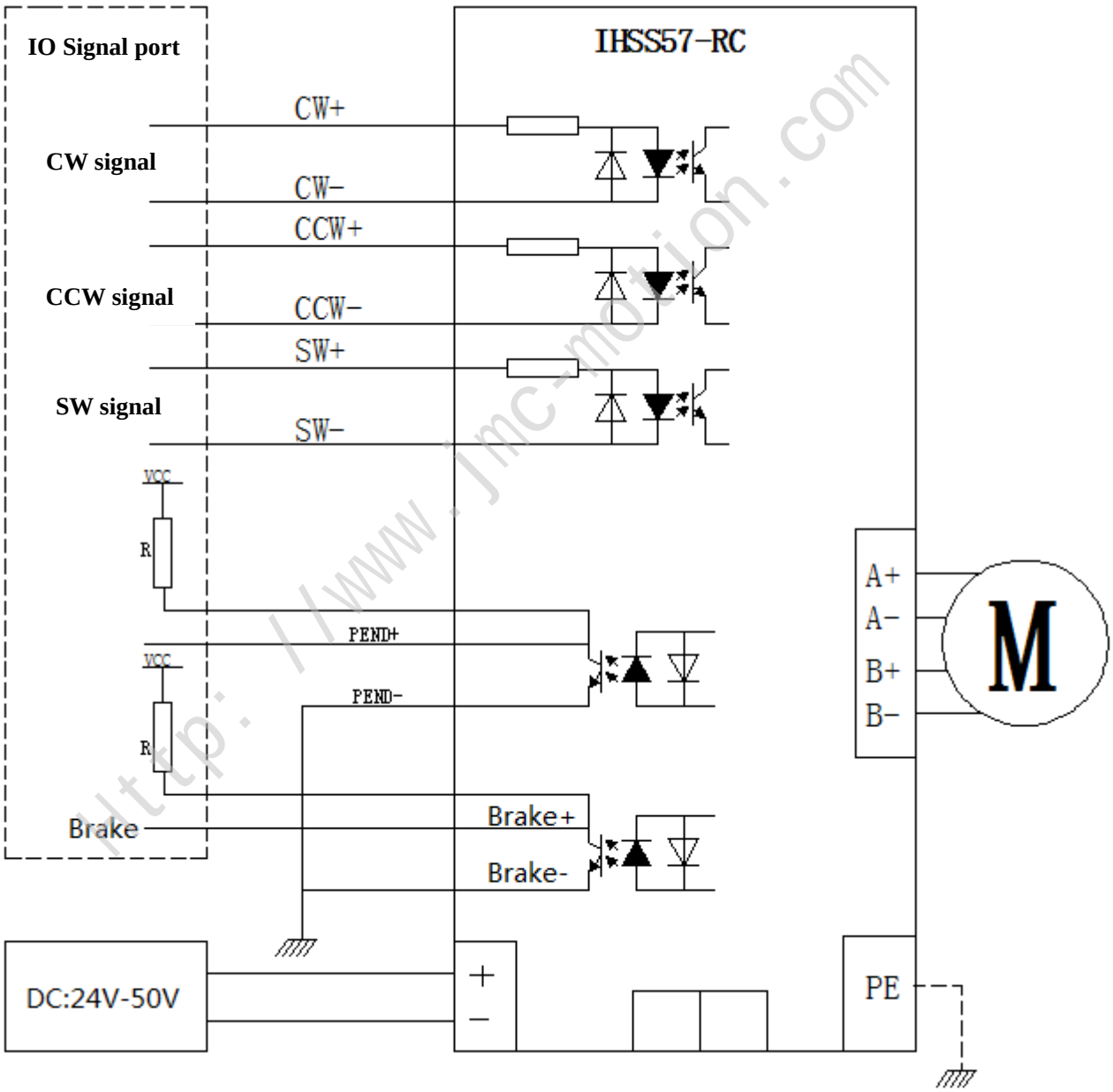


Figure 9 Typical wiring diagram

Attention :

1, the resistance R is connected to the control signal end, and the resistance is 3~5K.

2, BREAK signal to motor brake control need external relay control, the maximum through the current of 50mA.
3, RJ45 through the network interface standard twisted pair cable connected to the other from the slave, no special difference between the two port network.

八、Common problems and troubleshooting

1 Power lights don't light

- Input power failure, please check the power line. Whether the voltage is too low.

2 Power on or run a small angle of rotation alarm

- Check whether the power line is in good contact;
- Check the power supply voltage is correct;
- Check whether the P8 and P9 parameters are correct.

3 The communication was normal, but failed to run.

- Check the instructions sent by the master and whether the order is correct;
- Check the correctness of the corresponding parameters;
- Check whether the type of communication and connection is correct.

4 CAN communication anomaly

- Check whether the communication line is in good condition;
- Check whether the motor driver is set up as a CAN bus

communication protocol. If the motor communication protocol is not a CAN bus communication protocol, it is reset by the debugger;

- Check the correctness of the communication baud rate;

5 Drive over position errors

- Check whether the P16 parameters are correct.

6 Parameter upload error

- Reset the parameters;

7 Input over voltage

- Check whether the input voltage exceeds 50V, and if more than 50V, reduce the input voltage.

8 Communication error

- Check whether the baud rate is correct, and if it is incorrect, reconfigure it through a spin switch;
- Check whether the master and slave communication protocols are consistent, and if they do not agree, the protocol is reset by the debugger;

9 CW,SW,CCW directional limit

- Check whether the corresponding limit switch is activated, if not

activated, check whether the P42 parameter is the corresponding PNP or NPN limit switch connection value.

Appendix Keyboard description(ISU-DM)

1 Major function:

1.1 Reset parameters;
1.2 Parameter adjustment function;
1.3 Parameter upload and download function.

2 Introduction of key panel

Figure 1 Key panel diagram

2.1 Key function description:

Icon	Function	Serial number	Function
MODE/SET	Mode setting	ESC	Connection/Exit
◀	Move left	▼	Numerical subtraction
▲	Numerical increase	Enter	Confirmation
▶	Move right		

3 Power display and connection:

3.1The rEAdy_diagram is shown as follows:

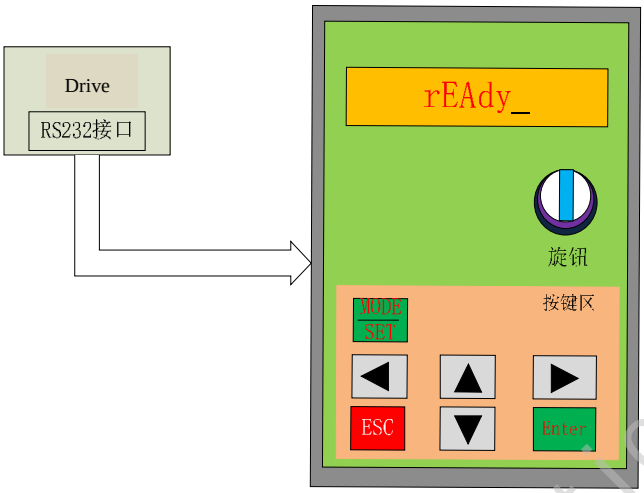


Figure 2 Display chart after power supply

3.2 Connection:

The connection success is shown as follows: (if the connection is not connected, the LED digital tube will always flicker)

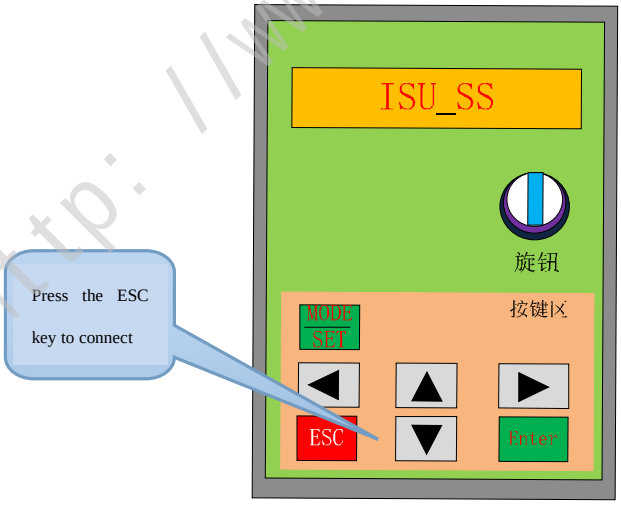


Figure 3 Connect the operating instruction

4 Mode function switching:

4.1 After the connection is successful, the MODE key enters the various mode functions, the following figure is the parameter reset function:

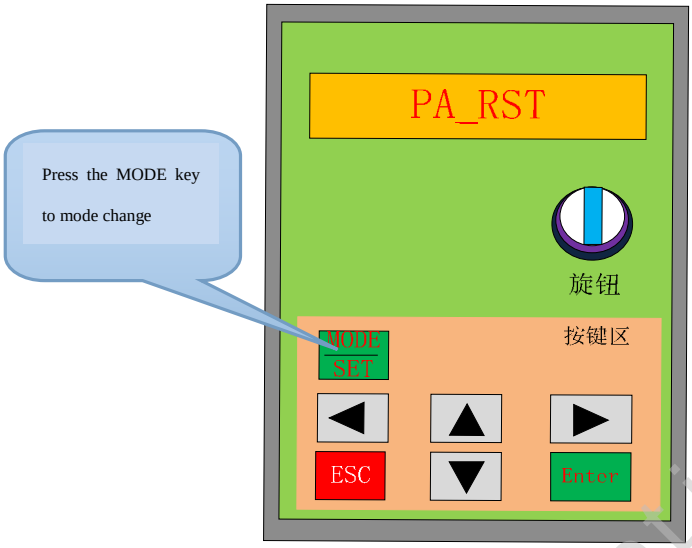


Figure 4 Instructions for function mode

4.2 The function description is as follows:

LED display	Function	Remarks
PR_RST	Reset parameter	Parameter initialization
PA_ _01	Parameter adjustment	Adjustment parameter value
dA_ _UP	Parameter upload/download	Multiple sets of parameters uploaded / downloaded

5 Operating instructions

5.1 Key operation block diagram:

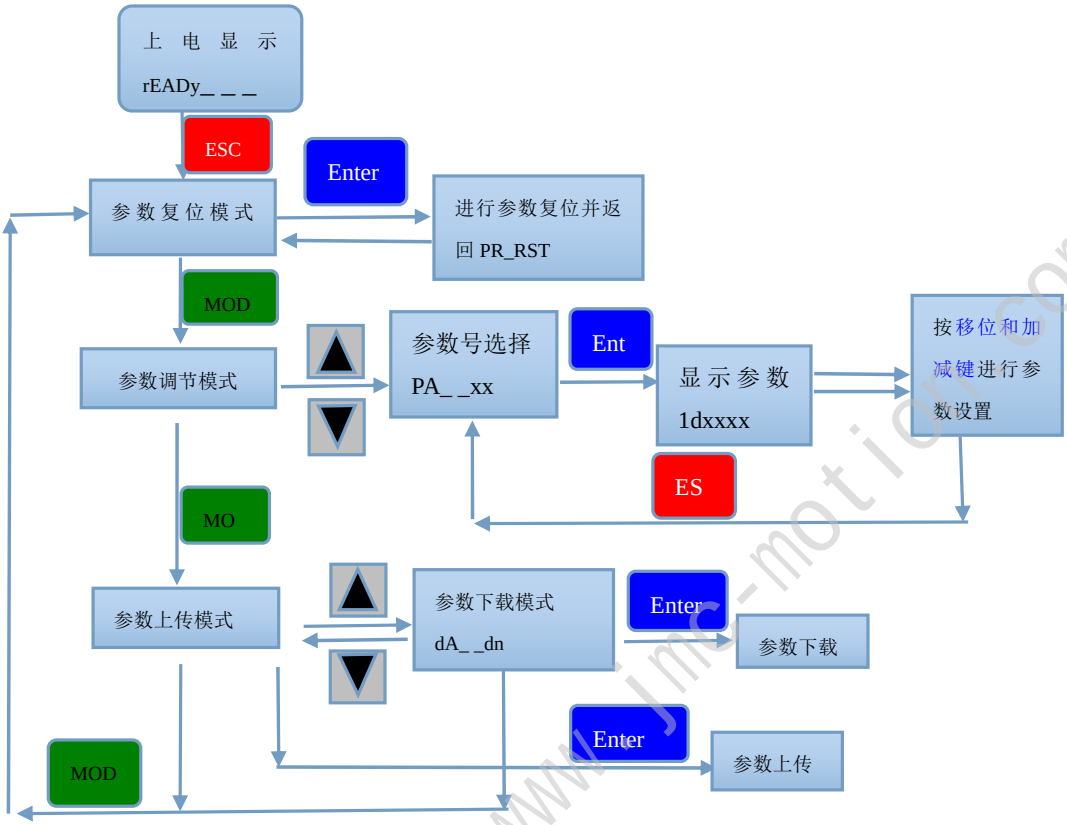


Figure 5 Key operation flow chart

Description: Press each function key to adjust the mode or parameter, the arrow indicates the effect after pressing the key.

5.2 Example of parameter mode operation:

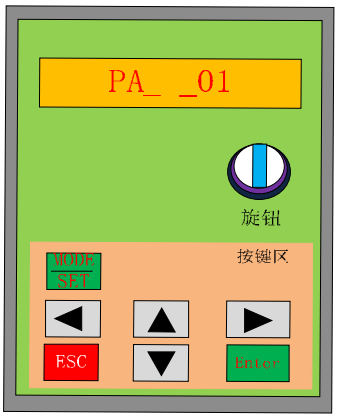


Figure 6 Display chart of parameter adjustment

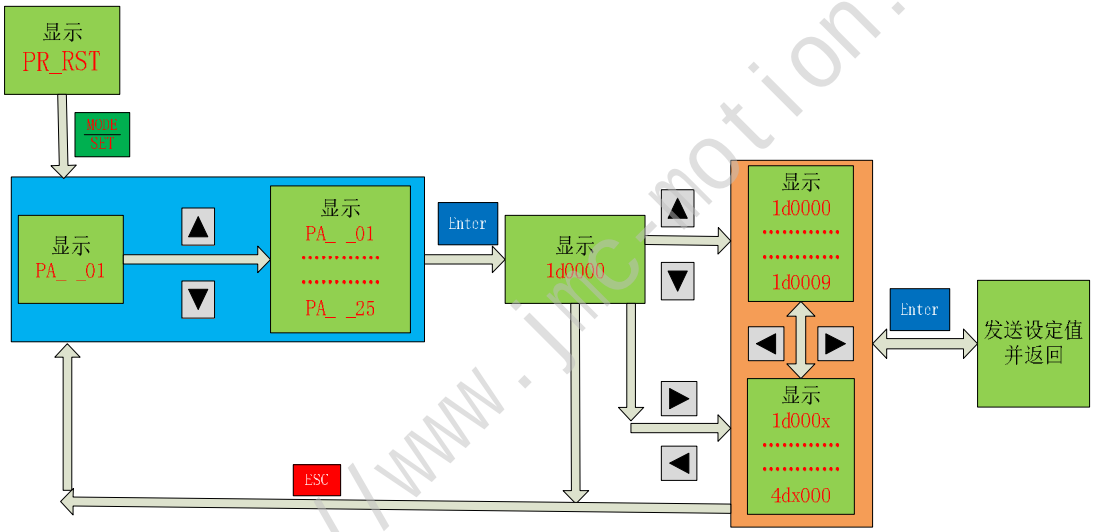


Figure 7 Flow chart of parameter adjustment

Description: The adjustment range of each parameter is 0--4000. When we press the Enter key to enter the adjustment parameters, we can see the initial value of the parameter. After changing the parameters, it shows the actual return value of the drive. (for example, the change send value is 9, the actual return 1, then display 1)

The parameter description is shown in the following table:

Display	Address	Initial value	Explanation	Range
PR_RST	0x00	11		0——4000
PR_ _01	0x01	xx		0——4000
PR_ _02	0x02	xx		0——4000
PR_ _03	0x03	xx		0——4000
PR_ _04	0x04	xx		0——4000
PR_ _05	0x05	xx		0——4000
PR_ _06	0x06	xx		0——4000
PR_ _07	0x07	xx		0——4000
PR_ _08	0x08	xx		0——4000
PR_ _09	0x09	xx		0——4000
PR_ _10	0x0a	xx		0——4000
PR_ _11	0x0b	xx		0——4000
PR_ _12	0x0c	xx		0——4000
PR_ _13	0x0d	xx		0——4000
PR_ _14	0x0e	xx		0——4000
PR_ _15	0x0f	xx		0——4000
PR_ _16	0x10	xx		0——4000
PR_ _17	0x11	xx		0——4000
PR_ _18	0x12	xx		0——4000
PR_ _19	0x13	xx		0——4000
PR_ _20	0x14	xx		0——4000
PR_ _21	0x15	xx		0——4000
PR_ _22	0x16	xx		0——4000
PR_ _23	0x17	xx		0——4000
PR_ _24	0x18	xx		0——4000
PR_ _25	0x19	xx	Knob	0——4000

contact us

Shenzhen Just Motion Control Electromechanics Co.,ltd.

Address：Floor2,Building A,Hongwei Industrial Zone No.6, Liuxian 3rd Road, Bao'an District, Shenzhen.China

Telephone：0755-26509689　26502268

Fax：0755-26509289

E-mail:info@jmc-motion.com

Http: //www.jmc-motion.com