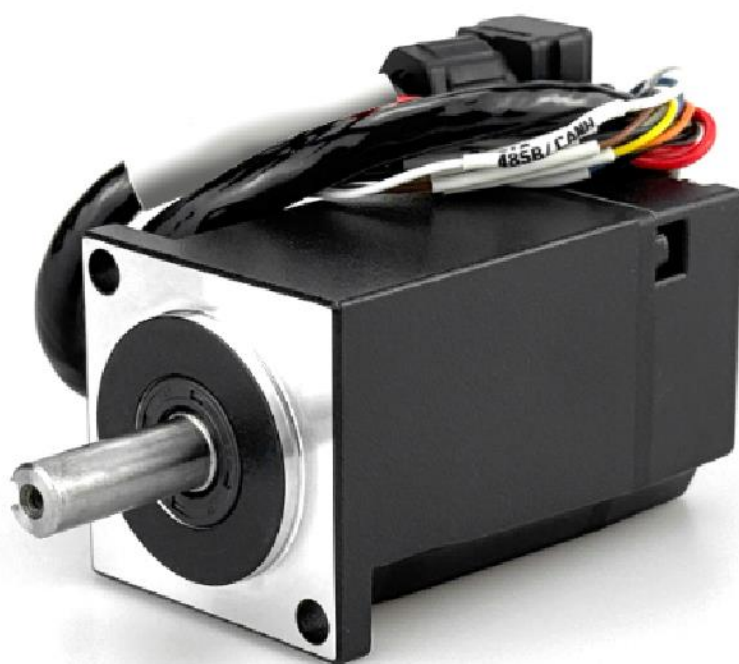


PMMP40L SERIES CANopen & RS485 Communication Integrated Waterproof Servo Motor

Instruction Manual



Safety Instructions

 Danger (May cause death or serious injury!)	
Wiring job, be sure to by professional electrical engineer according to the connection diagram installation operation.	Danger of electric shock and fire.
Before wiring , make sure that the power supply is off.	Danger of electric shock and fire.
The ground wire of the integrated motor and the input terminal of the power must be firmly installed.	Danger of electric shock and fire.
Do not bend , pull or clamp the connecting cable forcibly.	Danger of fire.
When using on the lifting device , please take measures to protect the position of the movable part.	Danger of injury.
Please set up circuit breakers and other safety devices to prevent external circuit short circuit and equipment failure can cut off the power supply in time.	Danger of electric shock and fire.
Do not use it in places with severe vibration and impact.	Danger of fire.
After the driver is powered off, the bus voltage will remain for a period of time. Do not touch the power input terminal within two minutes.	Danger of electric shock and fire.
For the power supply of the integrated motor, please use the primary and secondary reinforced insulated DC power supply.	Danger of electric shock.
Please cut off the power supply of the integrated motor during power failure, otherwise the integrated motor will start suddenly after restoring the power supply.	Danger of injury.
When the integrated motor is running, please ensure safety before releasing the holding force of the integrated motor.	Danger of injury.
Do not use the integrated motor near inflammable, explosive, corrosive environment and places easy to touch water.	Danger of electric shock and fire.
 Warning (May result in injury or damage to objects!)	
The integrated motor is strictly prohibited from being impacted: If it is impacted, the integrated motor encoder may be damaged or offset with the magnet position, affecting the accuracy or operation of the motor.	Risk of equipment failure.
Do not turn the motor shaft when the integrated motor power is OFF: If the motor shaft is turned at more than 400rpm when the electromechanical power is OFF, the integrated motor may cause drive damage due to regenerative current.	Risk of equipment failure.
When using the integrated motor, do not exceed its specification value.	Danger of injury and motor fault.
Do not hold the integrated motor output shaft or cable during handling.	Danger of injury and motor fault.
Please install the protective cover on the rotating part (output shaft) of the integrated motor.	Danger of injury.
Do not stack obstacles hindering ventilation around the integrated motor to ensure heat dissipation.	Danger of motor fault.
Do not touch the integrated motor when it is running or within a short time after it stops running. Please post a warning sign in a conspicuous position.	Danger of scalding.
Please use the integrated motor according to the specified parameters.	Danger of motor fault and

	fire.
Please install an emergency stop device or emergency stop circuit outside the integrated motor to ensure safe shutdown in case of failure or abnormal operation.	Danger of injury.
Please do not touch the shell during insulation resistance measurement or insulation withstand voltage test.	Danger of electric shock.
When the integrated motor is abnormal, please stop running immediately and cut off the power supply to avoid fire or injury.	Danger of injury and fire.
When using, ensure that the grounding resistance of the system is less than 4Ω . When multiple integrated motors are used in parallel, the grounding resistance between the ground of each integrated motor is less than or equal to 0.1Ω . The interface of the master controller and the slave station of the integrated servo motor should be in common ground, and the grounding resistance should be less than or equal to 0.1Ω . The integrated motor shell shall be installed on the integrated motor bracket through the installation hole. The bracket shall be reliably connected to the ground, and the grounding resistance shall be less than or equal to 0.1Ω .	Danger of motor fault.
The power supply of the integrated motor needs to be connected with a capacitor above $4700\mu\text{F}$, which is used to absorb the regenerative current generated by the external force and excessive deceleration of the motor and reduce the peak starting current of the high speed response of the large inertia load. Otherwise, it will cause serious damage of the motor.	Danger of motor fault.
 Caution	
Do not disassemble or modify the integrated motor, otherwise it may cause injury. For inspection or repair, please contact Nimotion, inc.	
When the integrated motor is scrapped, please disassemble it as far as possible and treat it as industrial waste.	
Before use, please read and fully understand the "Safety Instructions" to use the integrated motor correctly.	
This product is designed and manufactured for use in general industrial equipment. Don't use it for any other purpose. We hereby state that we will not be liable for any damages caused by ignoring this advice.	

1. Summary

1.1 Preface

Thank you for using PMMP40L series integrated servo motor products of Nimotion, inc. Please read this manual carefully before using!

PMMP40L series integrated low-voltage servo motor is a new waterproof servo product independently developed by our company. This product is based on the highly compact integrated development concept, which integrates permanent magnet synchronous motor, encoder, bus servo driver, digital volume I/O in one. The product adopts FOC magnetic field oriented control technology and SVPWM technology, and supports CANopen or RS485 bus control, has the characteristics of small size, simple connection. We hope that our products can help you achieve the desired motion control with superior performance, excellent quality and outstanding cost performance.

This manual is a manual for PMMP40L series integrated low-voltage servo motors. It provides motor selection, technical specifications, terminal definition, cable connection, etc. If you need to know the specific function and communication protocol of the motor, please read the communication manual or consult the technical support staff of Nimotion, inc.

As our company is committed to the continuous iterative improvement of integrated motors, so the information provided by the company should be changed, please refer to the latest version without prior notice.

1.2 About Manuals and Acquire

- Unauthorized reprinting or copying of all or part of the contents of this manual is prohibited.
- Please understand that the performance, specifications and appearance of the product may be changed without prior notice due to improvements.
- We strive to make the content of this manual as correct as possible. If you find any problems or errors or omissions, please contact Nimotion, inc.
- This manual is not shipped with the product. To obtain the electronic PDF file, you can obtain it in the following ways:
 - Log in to the official website of Nimotion, inc. (<https://www.nimotion.com>), "Member Center - Data download", log in to search keywords and download.
 - Scan the QR code on the product to obtain product related information.

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2. Product Inspection and Model Description

2.1 Unpacking Inspection

Please check the following items when unpacking:

- Whether it is the ordered product: Please check that the model and specification on the nameplate of the motor is the same as your order.
- Whether the product is damaged: Visually inspect the appearance for damage or scratches.
- Whether the screws are loose: Whether any screws are not locked or fall off.
- Motor without brake check whether the shaft is running smoothly: Rotate the motor shaft by hand, if it can run smoothly, it means that the motor shaft is normal.
- Motor with brake check whether the brake is normal: If the motor shaft is locked, the brake is normal.
- In case of any of the above situations, please contact us for proper solution.

Complete operational product components shall be included as follows:

- Integrated waterproof servo motor.
- Communication cable required.
- Communication interface components required.

2.2 Product Model

2.2.1 Naming Rules

<u>PMM</u>	<u>P</u>	<u>X</u>	<u>40</u>	<u>XX</u>	<u>B</u>	<u>-</u>	<u>485</u>	<u>-</u>	<u>L</u>	<u>0</u>	<u>H</u>	<u>E</u>
①	②	③	④	⑤	⑥	⑦	⑧	⑨	⑩	⑪		
① PMM: Integrated Servo Motor						② Ingress Protection: Default-IP54、P-IP65						
③ Rated speed: Default-3000						④ Width of motor base: 40-40mm						
⑤ Rated power: 10-100W						⑥ Performance of encoder: B-17 bit encoder						
⑦ Communication mode:CANopen-CANopen, 485-RS485												
⑧ Hardware function code					⑨ Length of shaft: 0-Standard length; 1-Non standard length							
⑩ Shaft key form: S-Light shaft; F-Milling flat; K-Half circle key; H-Flat key; M-Perforated installation												
⑪ Special processing code: S-No special processing; A-Gear; B-Screw; E-Center thread hole												

Figure2-1 Naming Rules for PMMP40L Series

2.2.2 Installation Dimension

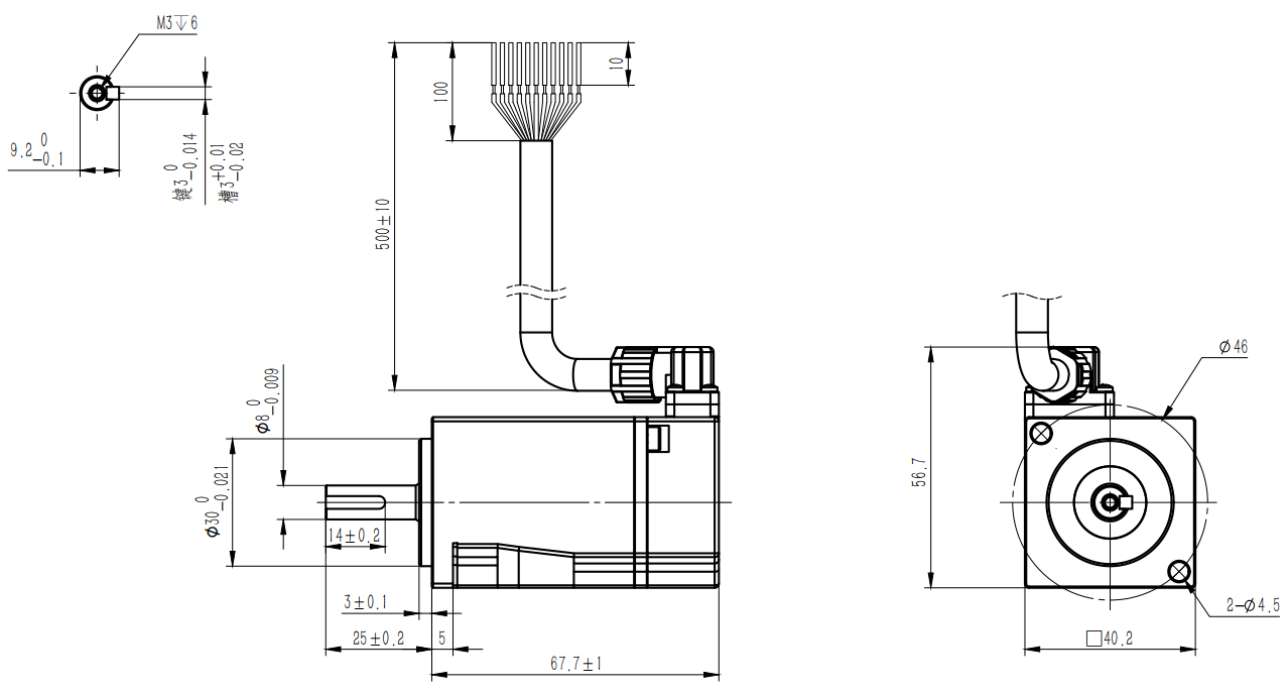


Figure2-2 Structure Diagram of PMMP40 Series Motor

Table2-1 Motor Model and Some Key Dimensions

Model	Length (X in Figure)(mm)	Shaft diameter	Brake	Brake holding torque (N·m)	Rotor inertia (kg·m ²)	Weight (Kg)
PMMP4010B-485-L-OHE	67.7	Φ8	No	-	6.2*10 ⁻⁶	0.43
PMMP4010B-CANopen-L-OHE	67.7	Φ8	No	-	6.2*10 ⁻⁶	0.43

2.3 Torque Curve

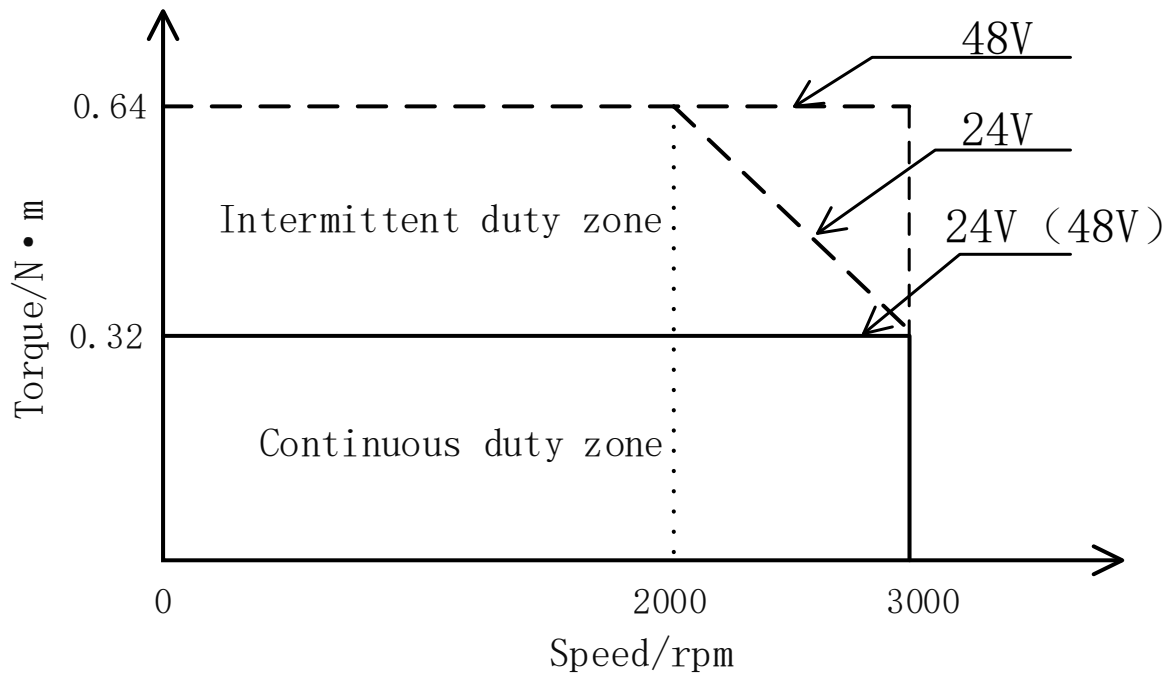


Figure2-3 PMMP4010B-CANopen485-L-X Torque-speed curve

- Note: 1. Do not use the motor for more than 10s in the intermittent duty zone.
 2. If an integrated servo motor operates continuously at its rated power for a long time, it may trigger alarms such as excessive temperature! When using it, please operate it at a reduced power level according to the actual situation.

3. Specifications

3.1 Technical Specifications

Table 3-1 Motor Technical Specification

Model		PMMP4010B-XXX-L-XX
Supply voltage(VDC)		12~52
Rated voltage (VDC)		24
Rated speed (rpm)		3000
IP rating		IP65
Rated current (A)		6.5
Rated torque (N·m)		0.32
Rated power (W)		100
Environment	Temperature(°C)	0~40
	Humidity (RH)	10%~85%, No condensation
	Altitude (m)	<1000
	Installation environment	No corrosive gas, inflammable material, oil mist, etc., and no strong vibration
	Installation method	Horizontal or vertical
Driver method		FOC(magnetic field oriented control) technology and SVPWM
Encoder	Type	Built-in encoder
	Resolution	17 bit
	Characteristics	Multi-circle absolute value count, power down automatic storage
Control signals	DI (Digital input)	- Quantity: 3 - No isolation, Set the configuration of object 2003_h:15_h to enable pull-up operation - Can connect external DC power supply: 12~24V - Support NPN、PNP Configurable functions: •Used as a switch
	DO (Digital output)	- Quantity:1 - Maximum load current: 0.5A - Configurable functions: - Ordinary digital output; - Motor running and stopping; - Arrival of target; - Alarm output; (When the motor state meets the above conditions, the DO switch state changes.)

Table3-2 Motor Technical Specification

Model		PMMP4010B-XXX-L-XX
Brake resistance		Built-in 15 Ω /25W
Communication protocol		CANopen、Modbus RTU(RS485)
Transmission Rate		- CANopen: 1Mbps,800kbps,500kbps,250kbps,125kbps,100kbps,50kbps, 20kbps,10kbps; The default is 1Mbps. - Modbus RTU(RS485):1Mbps,500kbps,256kbps,115.2kbps, 57.6kbps, 38.4 kbps,19.2kbps, 9.6kbps; The default is 115.2kbps.
Control mode	CiA402	- Profile position mode (PP), Profile velocity mode(PV), Profile torque mode(PT), Velocity mode(VM). - Interpolated position mode(IP) - Homing mode(HM)(Switch to find the origin, Finding the origin by blocking rotation) - Cyclic synchronous position mode(CSP), Cyclic synchronous velocity mode(CSV), Cyclic synchronous torque mode(CST).
	NiMotion	- Position mode: multi-segment position control, digital quantity setting control. - Velocity mode: multi-segment velocity control, digital quantity setting control. - Torque mode: digital quantity setting control.
Features	Fault diagnosis	Overvoltage/Undervoltage/Overtemperature/Hardware failure /Stall/Overload/Overspeed/Initialization failure /Storage failure/Over limit detection/Homing timeout/Track failure/Target position overflow fault, etc.
	Fault reset	The alarm is self-reset, and the fault is manual reset.
	Software position limit	The position range is set by the software, and the motor lock shaft is out of the range and the alarm is raised.
	Identification of parameters	It has the function of parameter identification and PI parameter self-tuning.
	Recovery of position	It can be configured for single-turn position value recovery or multi-turn absolute position value recovery.
	Gain switching	Two groups of gain parameters can be preset, and the two groups of gain can be switched automatically according to different motor operating states.
	Resonance suppression	Effectively suppress vibration frequency range is greater than or equal to 300Hz.
	Low frequency suppression	Effectively suppress vibration frequency range is less than or equal to 100Hz.
	Parameter save and restore	To save and restore the default parameters.
	Online upgrade	Update in time according to the actual needs of the product to improve maintainability and efficiency.

3.2 Indicator

Table3-3 Meaning of Indicator

Meaning	Green light (RUN)	Yellow light (COM)
Normal communication	Steady light	Light flashes slowly (1s flashing frequency)
Communication is normal, internal warnings are generated.	Light off	Light flashes slowly (0.5s flashing frequency)
Communication is normal, internal faults occur.	Light off	Light flashes slowly (0.5s flashing frequency)
Communication is normal, the hardware failure occurs.	Light off	Light flashes slowly (0.5s flashing frequency)
The power supply is abnormal or has a serious fault.	Light off	Light off

3.3 Definition of Terminal

3.3.1 Connection Definition

Table3-4 Definition of Connect port

Pin	Function	Note
1	485A/CANL	Blue
2	485B/CANH	White
3	GND	Grey
4	GND	Brown
5	DO1	Orange
6	DI3	Black
7	DI2	Yellow
8	DI1	Green
9	VIN+	Red(Power+,12~52V)
10	VIN-	Black(Power -)
11	Logic Power	Red(Logic power,12~52V)

Note:1.The positive and negative poles of the power cord cannot be connected in reverse, otherwise the motor may be damaged. And the original manufacturer cannot provide warranty service for such damage.

2.If there is no need for a logic power supply, it can be left unconnected.

3.3.2 Wiring Diagram of I/O

DI1, DI2, DI3 are connected to the NPN sensor.

Configure pull-up by setting the object 2003_n: 15_n, and write 1 to the object to enable pull-up.

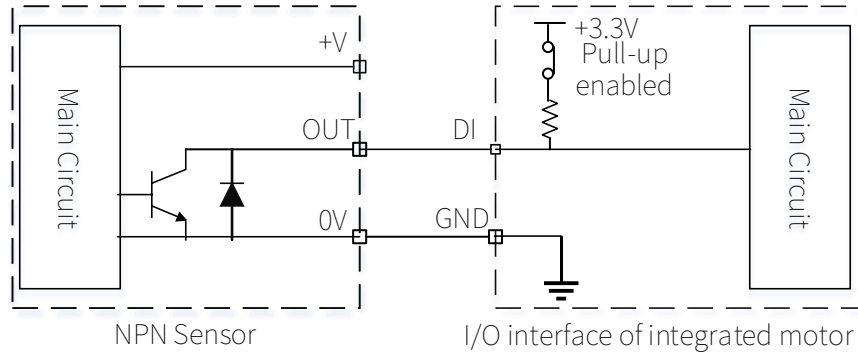


Figure3-1 Diagram of DI input port connected to NPN type sensor

+V terminal of the sensor is connected to the positive pole of power supply, 0V terminal of the sensor and GND terminal of I/O interface of motor is connected to ground, DI terminal of I/O interface of motor is connected OUT terminal of the sensor.

DI1, DI2, DI3 are connected to the PNP sensor.

Configure pull-up by setting the object 2003_n: 15_n, and write 0 to the object to cancel pull-up.

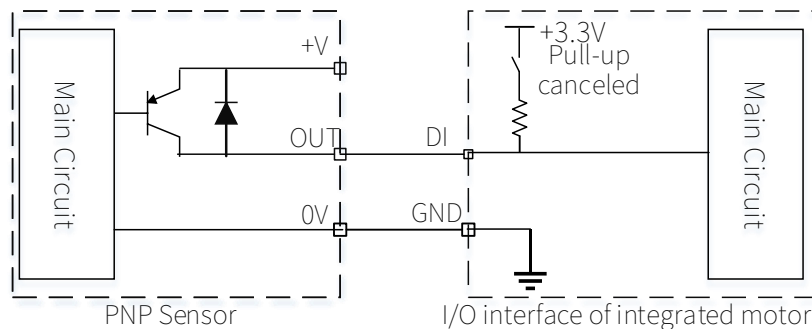


Figure3-2 Diagram of DI input port connected to PNP type sensor

+V terminal of the sensor is connected to the positive pole of power supply, 0V terminal of the sensor and GND terminal of I/O interface of motor is connected to ground, DI terminal of I/O interface of motor is connected OUT terminal of the sensor.

DI1, DI2, DI3 are connected to the switch.

Configure pull-up by setting the object 2003_h: 15_h, and write 1 to the object to enable pull-up.

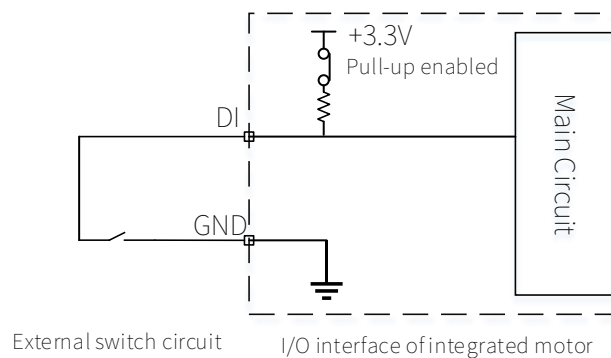


Figure3-3 Diagram of the DI input port connected to the switch

DI terminal of I/O interface of motor is connected to one end of switch, the other end of switch and the GND terminal of I/O interface of motor is connected to ground.

DI1, DI2, DI3 are connected to the pulse.

Configure pull-up by setting the object 2003_h: 15_h, and write 1 to the object to enable pull-up.

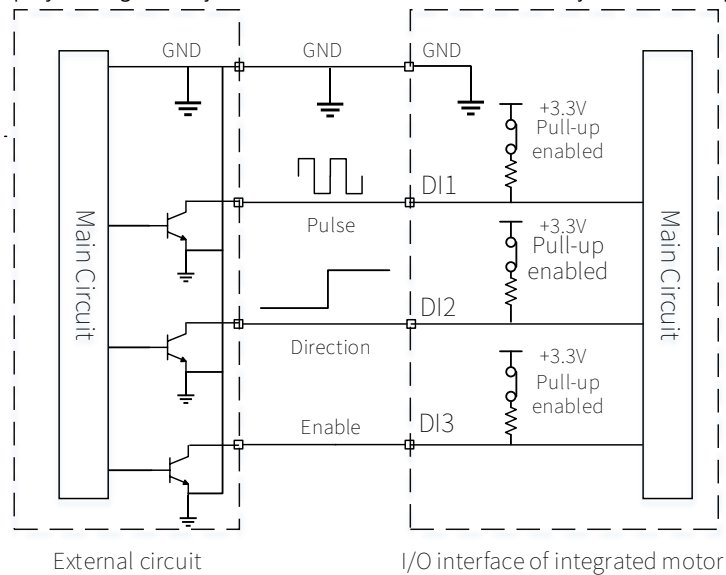


Figure3-4 Diagram of the DI input port connected to the pulse

DO1 (Configured as DO) is connected to LED.

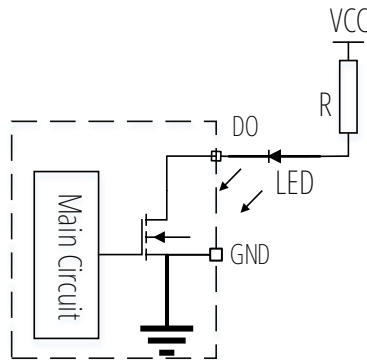


Figure3-5 Diagram of DO1 output port connected to LED indicator light

The positive terminal of the power supply VCC is connected to the current-limiting resistor and then connected to the positive terminal of the LED lamp. The I/O interface DO is connected to the negative terminal of the LED lamp, and the I/O interface GND is connected to the negative terminal of the power supply.

4. Install and Connect

4.1 Installation Precautions

4.1.1 Installation Places

- ① Please install it in the control cabinet without direct sunlight, and do not place flammable materials around it.
- ② Do not use this product in a corrosive environment such as hydrogen sulfide, sulfite, chlorine, ammonia, chlorinated gas, acid, alkali, salt, or in an inflammable gas environment or combustible materials.
- ③ No cutting fluid, oil mist, iron powder, iron filings and other places.
- ④ Well-ventilated, dry and dust-free place.
- ⑤ A place without vibration.
- ⑥ Do not use gasoline, diluent, alcohol, acid and alkaline cleaning agent, so as to avoid the shell discoloring or damage.

4.1.2 Installation Requirements

- ① The installation direction of the integrated motor should be consistent with the direction of the heat sink and the heat dissipation duct of the system to ensure good heat dissipation effect.
- ② The wiring end face of the integrated motor shall reserve at least 30mm space for easy maintenance and operation.
- ③ The integrated motor wiring should be tied at a distance of 30 ~ 40mm from the motor to prevent the loosening of the plug for a long time.
- ④ Before powering the integrated motor, make sure that the communication cables and power cables are connected correctly. If you need to use the IO function, you should connect the corresponding IO cables (Recommend using our company's standard cable).
- ⑤ According to the company's selected communication cable to correctly select the installation network, optional terminal matching head installed in the network terminal position, to achieve signal terminal matching.

4.1.3 Installation Cautions

- ① When connecting with the machine, please use the coupling, and keep the axis of the servo motor and the axis of the machine in a straight line.
- ② Do not make the wire "bend" or exert "tension" on it;
- ③ When connecting the connectors, make sure that there are no foreign objects such as garbage or metal sheets in the connectors.
- ④ When carrying out the operation under the condition of keeping the cable connected, please be sure to hold the main body of the integrated motor. If only catch cables carrying, could damage the connector or cut cables.
- ⑤ If the use of curved cable, should be fully paid attention in the wiring operation, do not apply stress to the connector part. If stress is applied to the connector portion, it may cause connector damage.

4.2 Cable Wiring and grounding Requirement

4.2.1 Wiring Requirements

Alternating electromagnetic fields around AC cables, especially in the power supply and integrated motor cables, may interfere with the integrated motor and other equipment. Please note the following requirements:

- ① The integrated motor power cord adopts 16AWG ~ 24AWG twisted-pair copper wire, and the temperature resistance should be greater than or equal to 105°C (the value is the recommended value, please select according to the actual working conditions).
- ② The communication cable adopts the characteristic impedance of 120Ω, 22AWG ~ 24AWG twisted-pair shielded line, and the temperature resistance should be greater than or equal to 105°C (the value is the recommended value, please select according to the actual working conditions).

③ All kinds of cable wiring should be divided into bundles and slots. Different types of cables should be crossed, and cables should be at right angles to each other. The I/O signal cable and communication cable are more than 0.2m away from the system power cable.

4.2.2 Grounding Requirements

The product adopts common ground design internally, and the power supply, communication cable and IO port are common ground design. In order to make the product correctly grounding, please observe the following precautions:

① In order to prevent electric shock, please be sure to ground the ground terminal. For the method of grounding, please follow the relevant national or regional electrical regulations.

② In order to prevent electric shock, please confirm that the protective grounding conductor conforms to the technical specifications and local safety standards, and minimize the length of the grounding wire.

③ When using multiple devices, follow the instructions for grounding all devices. Improper grounding of the device may cause maloperation of the equipment.

④ The grounding terminal must be reliably grounded, otherwise it will lead to abnormal work or even damage of the equipment.

⑤ Do not share the ground terminal with the neutral wire (N-terminal) of the power supply.

⑥ Protective grounding conductor must use yellow-green copper conductor cable, and cannot be connected with circuit breakers and other switchgear.

⑦ Recommended installation on the conductive metal surface, to ensure that the entire conductive bottom of the equipment and the installation surface is good lap.

Common Power Supply Ground

In the communication networking of multiple integrated motors, if there are multiple power supplies in the system, the power supply should be common ground (common GND, that is, the negative pole of the power supply). The ground resistance of the electrical system involved in Unicom's communication bus is $< 4\Omega$.

Common Signal Ground

The main controller, communication bus master station and communication converter communication port connected to the communication bus of the integrated motor shall be isolated by electrical isolation technology, and the ground of the communication ground (RS485_GND, CAN_GND) and the communication interface of the integrated motor shall be common (common GND, namely communication interface GND).

Protective Grounding

The integrated motor shell should be installed to the motor bracket through the mounting hole, and the bracket should be reliably connected to the ground. The resistance between the integrated motor shell, the accessible grounding metal shell and the grounding terminal should not exceed 0.1Ω .

4.3 Communication Distance

4.3.1 RS485 Communication

RS485 communication transmission medium can choose type A and type B two kinds of wire, A is shielded twisted pair, B is ordinary twisted pair. However, Type A wire is specified in the EN50170 standard, and Type A has a larger extension length than type B, as shown in Table 4-1 and Table 4-2.

Table4-1 Communication Transmission Medium of RS485

Parameters	Type A	Type B
Characteristic impedance (Ω)	135~165	100~130
Capacitance per unit length (PF/m)	<30	<60
Loop resistance (Ω /km)	110	-
Wire core diameter (mm)	0.64	>0.53
Wire core cross-sectional area (mm^2)	>0.34	>0.22

Table4-2 Communication Distance and Baud Rate of RS485

Baud rate (bps)	Bus length (m) (Type A)	Bus length (m) (Type B)	Note
1.5M	100	Not Recommended	This parameter is the estimation in the ideal state and is for reference only. The actual application is affected by many factors. Please refer to the actual application
1M	200	100	
500k	400	200	
256k	800	600	
115.2k	1000	1000	
57.6k	1200	1200	
38.4k	1200	1200	
19.2k	1200	1200	
9.6k	1200	1200	

Under the ideal environment (the load RS485 bus device is one, the baud rate is 9600bps, the use of high-quality communication wire) the longest communication distance of RS485 bus theory is about 1200m.

RS485 bus communication distance reduction factors: there are a number of loads RS485 equipment, wire characteristic impedance does not meet the standard, the wire diameter is small, non-quality converter, equipment lightning protection complex and baud rate is too high factor, will shorten the RS485 communication distance.

For how to reduce interference and the impact of communication distance reduction: Both to increase the transmission distance, but also to ensure the stability of the transmission signal. It is usually necessary to stay away from interference sources (large mechanical equipment) as far as possible, increase shielding measures, increase repeaters, reduce the transmission rate (baud rate), and use high-quality communication cables and converters and so on.

4.3.2 CAN Communication

Table4-3 Communication Distance and Baud Rate of CAN

Baud rate (bit/s)	Bus length (m)	Nominal bit time(μ s)	Sampling point location	Sampling point range	Note
1M	25	1	87.5% (875 ns)	75%~90%	This parameter is the estimation in the ideal state and is for reference only. The actual application is affected by many factors. Please refer to the actual application
800k	50	1.25	87.5% (1.09375 μ s)	75%~90%	
500k	100	2	87.5% (1.75 μ s)	85%~90%	
250k	250	4	87.5% (3.5 μ s)	85%~90%	
125k	500	8	87.5% (7 μ s)	85%~90%	
50k	1000	20	87.5% (17.5 μ s)	85%~90%	
20k	2500	50	87.5% (43.75 μ s)	85%~90%	
10k	5000	100	87.5% (87.5 μ s)	85%~90%	

The above tabulated data are the parameters in the ideal state. In practical application, when the distance of the wire to transmit the signal is too long, the signal will be distorted due to environmental problems (such as electromagnetic, electric field interference) and the characteristic impedance of the wire itself.

How to optimize the communication distance of the CAN bus: reduce the length of the branch, add appropriate matching resistance to the long branch, use shielded cables and correct grounding, reduce the number of CAN bus nodes, reduce the transmission rate (baud rate), increase the CAN repeater or hub, etc.

4.4 Other Cable Wiring

4.4.1 Wiring Diagram of Communication

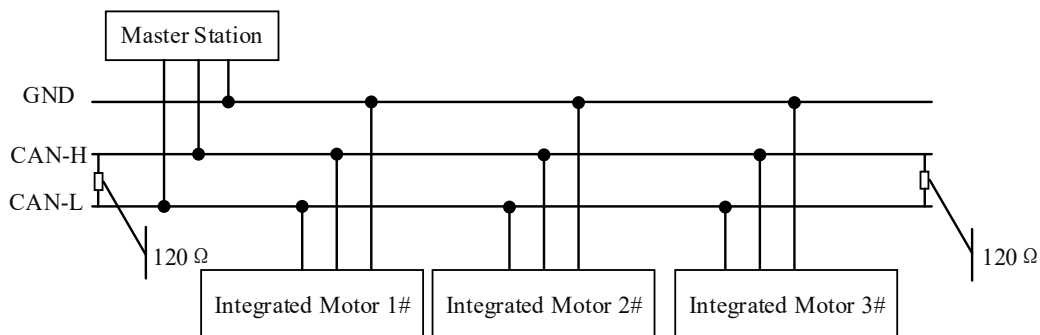


Figure4-1 Wiring Diagram of CANopen Communication

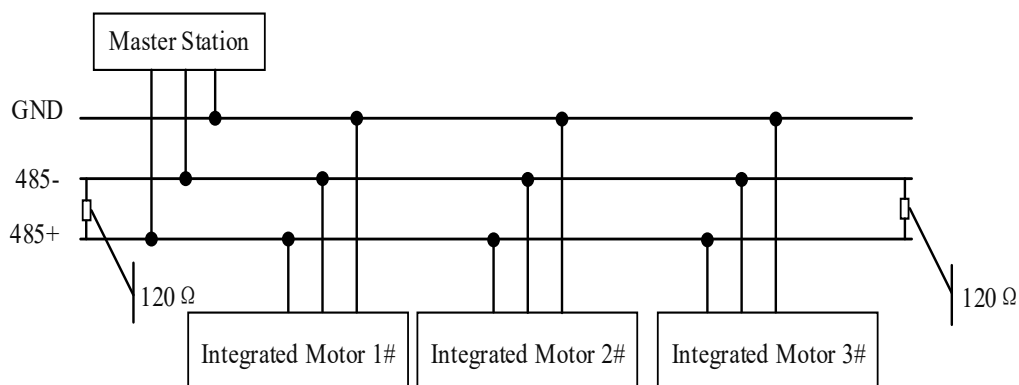


Figure4-2 Wiring Diagram of RS485 Communication

4.4.2 Debugging Wiring

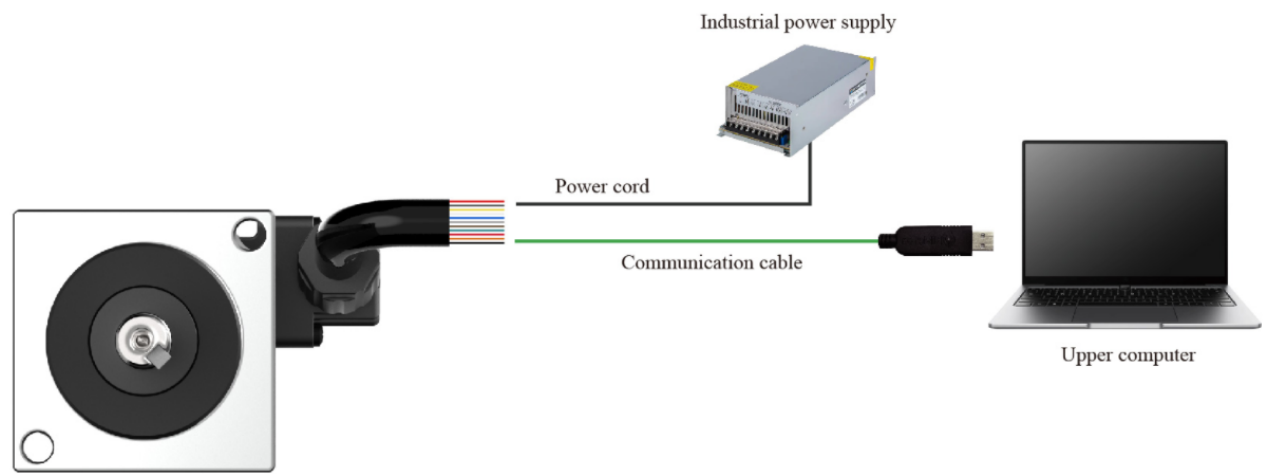


Figure4-3 Debugging wiring connection

4.4.3 External Control Wiring

Control via communication bus

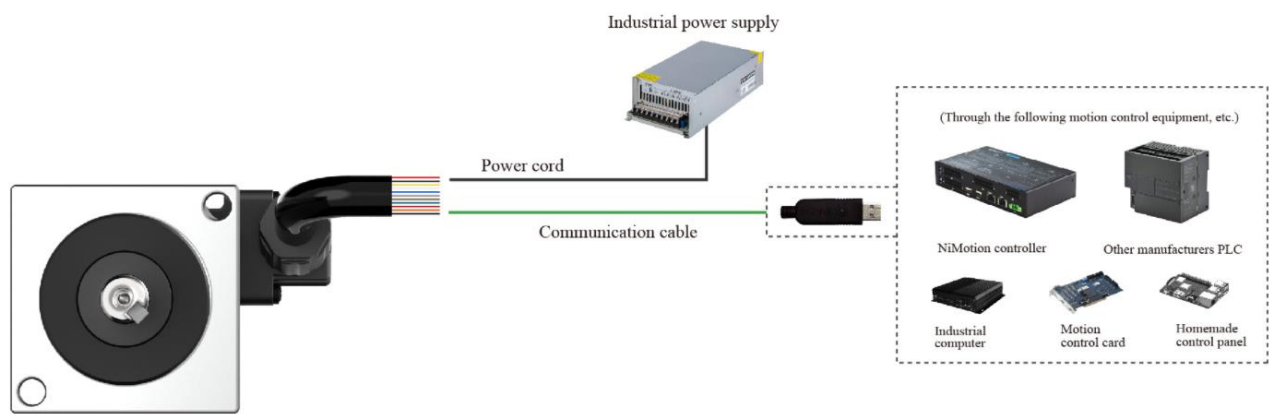


Figure4-4 External control wiring connection (Control via communication bus)

4.4.4 Communication Networking Wiring

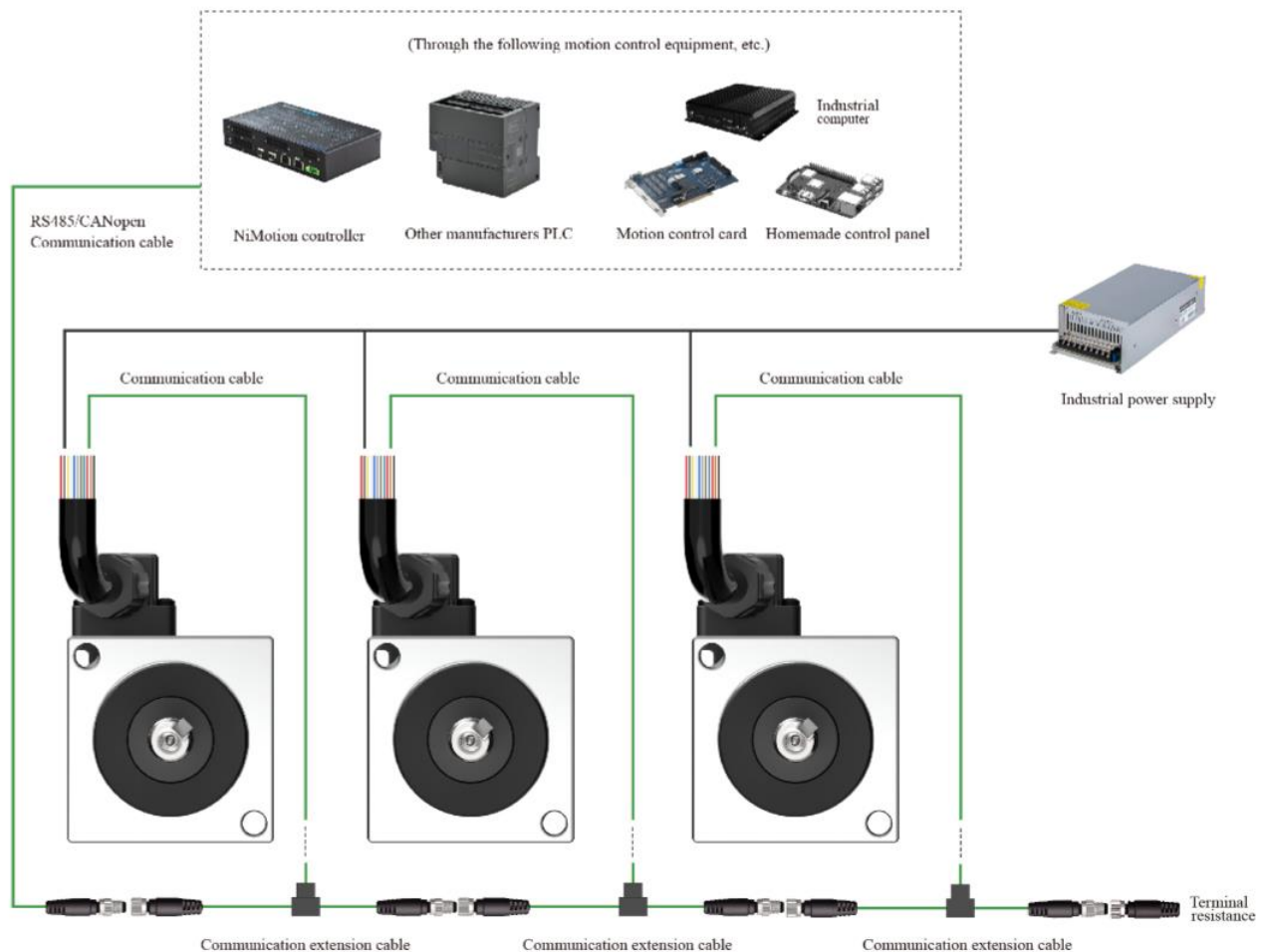


Figure4-5 Network topology (CANopen&RS485)

4.4.5 Network wiring requirements

a. RS485 networking requirements

- ① RS485 can use a variety of types of media for transmission, but should use in accordance with the "GBT 19582.2-2008 Modbus protocol implementation guide on serial links" standard cable.
- ② RS485 bus please be sure to use Daisy chain connection, all nodes RS485 signal reference connected together.
- ③ The terminal matching resistor must be configured at the end of the cable to prevent RS485 signal from reflection.
- ④ The node branch should be as short as possible: long branches cause obvious characteristic impedance mismatch, and then cause signal reflection, so the branch should be ensured as short as possible, generally not more than 30cm.
- ⑤ The number of bus nodes: depends on the actual application conditions and transmission media hardware characteristics.

b. CAN networking requirements

- ① Cables shall be connected in accordance with GBT 41588.3-2022 Road Vehicle Controller LAN (CAN) Part 3: Low-Speed Fault-tolerant, media-related Interfaces.
- ② The CAN bus please be sure to use Daisy chain connection, and the reference ground of CAN signal of all nodes is connected together.
- ③ The terminal matching resistor must be configured at the end of the cable to prevent CAN signal reflection.

-
- ④ The length of the branch node should not be too long, generally not more than 30cm.
 - ⑤ The number of bus nodes: depends on the actual application conditions and transmission media hardware characteristics.

5. Product Selection

5.1 Cable Selection

Table 5-1 Cable Selection

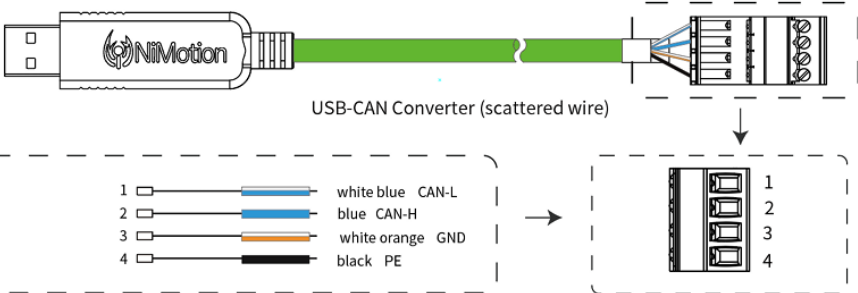
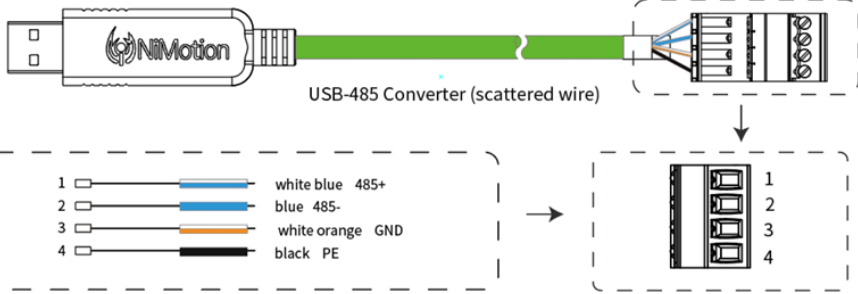
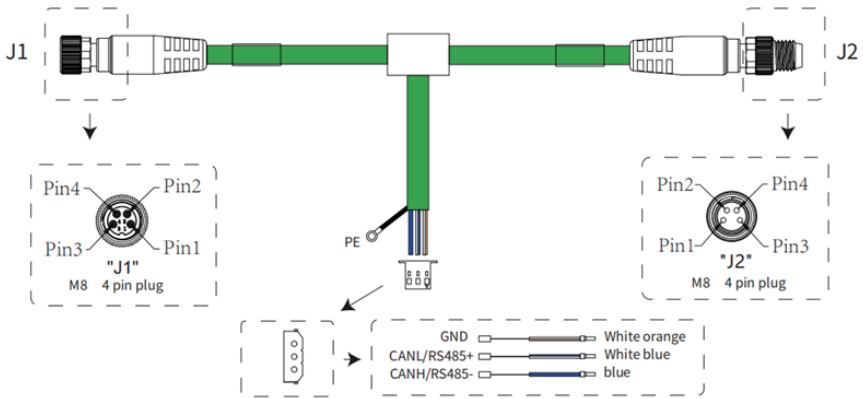
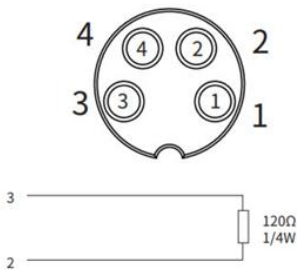
PMMP40L series integrated servomotor cable selection table	
Cable type	Cable appearance
SCM-USBCANI-L Converter	
SCM-USB485A-L Converter	

Table 5-2 Cable Selection

PMMP40L series integrated servomotor cable selection table	
Cable	Cable appearance
Communication extension line SDCX001	
Terminal Resistor STR001-120	 
1. Communication converter: Used for RS485/CANopen communication, the integrated servo motor is connected to the computer for parameter setting and debugging. 2. Communication cable: Used for RS485/CANopen integrated servo motor communication. 3. Communication extension cable: Used to extend the communication cable according to the actual application condition. 4. Terminal resistance: Used to connect at the end of the communication bus lines, improve the anti-interference ability.	

6. Alarm Function

Table6-1 Alarm Function

Alarm Code	Alarm Contents	Default Alarm Type	Self reset or not
0x2300	Motor overcurrent alarm	Fault	No
0x4012311	Motor overload alarm	Alarm	Yes
0x3002312	Motor stalled alarm	Pause and lock the shaft	No
0x1013210	Power supply overvoltage alarm	Fault	Yes
0x1013220	Power undervoltage alarm	Fault	Yes
0x1003221	Power supply failure	Fault	No
0x14210	Overtemperature alarm	Fault	Yes
0x14220	Low temperature alarm	Fault	Yes
0x5080	Drive failure	Fault	No
0x5540	Flash operation failure	Fault	No
0x5541	Flash initialization failure	Fault	No
0x4005542	Flash validation error warning	Alarm	No
0x5543	No parameters in flash user area	Fault	No
0x4005544	Power failure position storage anomaly	Alarm	No
0x6000	Hardware initialization failure	Fault	No
0x16320	Parameter setting error	Fault	Yes
0x6321	Registration failure	Fault	No
0x7305	Z pulse fault	Fault	No
0x4017307	Encoder warning	Alarm	Yes
0x17310	Overspeed	Fault	Yes
0x3017501	Communication failure	Alarm	Yes
0x4017502	Illegal address	Alarm	Yes
0x4017503	Illegal data value	Alarm	Yes
0x4017505	Confirmation in communication	Alarm	Yes
0x4017506	Slave in communication	Alarm	Yes
0x401750C	Request data is larger than mapping data	Alarm	Yes
0x401750D	The number of request data is not equal to the number of mapping data	Alarm	Yes

Table6-2 Alarm Function

Alarm Code	Alarm Contents	Default Alarm Type	Self reset or not
0x401750E	The address of the packet node is incorrect	Alarm	Yes
0x8610	The origin regression timeout	Fault	No
0x8611	Out of position	Fault	No
0x3018613	Software limit error	Pause and lock the shaft	No
0x3018614	The limit switch is incorrect	Pause and lock the shaft	No
0x4018615	Curve planning calculation error	Alarm	Yes
0x18616	Target location overflow	Fault	No
0x5018617	Curve planning parameters are too small	ignore	Yes
0xFF01	Motor parameter identification failure	Fault	No
0x0401FF02	Parameter saving fault	Alarm	Yes

Note: Please refer to the corresponding communication manual for more details of alarm failure.

7. Daily Inspection and Maintenance

Table7-1 Daily Inspection and Maintenance

Inspection Items	Inspection Time	Key points of inspection and maintenance	Note
Vibration and sound inspection	Everyday	Visual and auditory judgment	-
Fixing and connecting	At least once a week	Periodically check whether the screws at the motor installation site, the motor rotor and the mechanical connection, the screws at the terminal station and the mechanical part are loose.	-
Inspection of appearance	Once a week	Wipe with cloth or clean with air gun.	-
Replace oil seal	At least every 5000h/ time	Remove the motor from the machine and then replace the oil seal	Motors with oil seal only
Comprehensive inspection	At least once every 20,000 hours or every 5 years	-	-

Version Change Record

Version	Description of Revised Content	Date
A	Establish	2026-1-27

- It is forbidden to reprint or copy all or part of this manual.
- Product performance, specifications and appearance are subject to change without prior notice due to improvement, please forgive me.
- We strive to make the contents of the manual as accurate as possible. If you find any problems, errors or omissions, please contact Beijing NiMotion Control Technology Co., Ltd.

Beijing NiMotion Control Technology Co., Ltd.
Building 3, No. 12 Jinxing Road, Daxing District, Beijing
WhatsApp: +1 626 203 5767
Mail: nimotion-al@nimotion.com
Website: <http://www.nimotion.com>