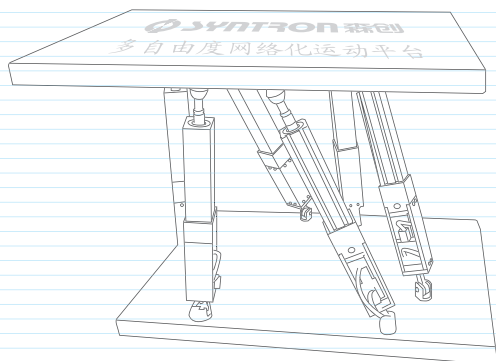
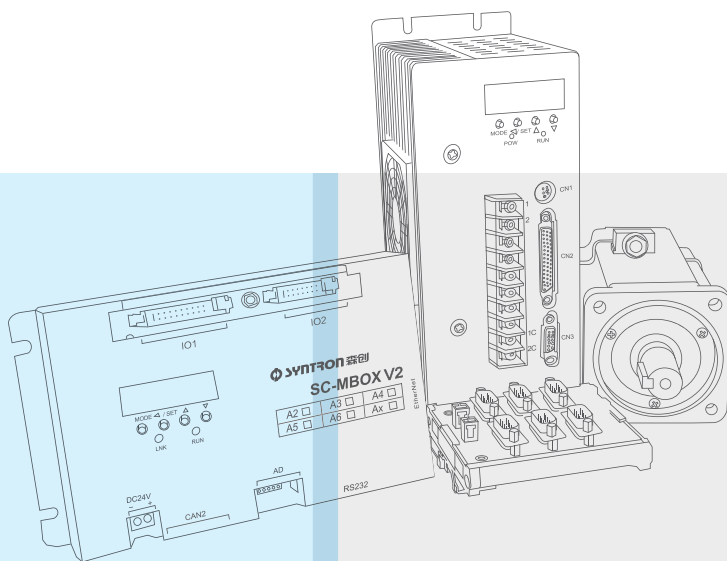




SC-MBOX动感平台系统

使用手册



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version number10/2014

Explanation of safety-related symbols



Use this mark when incorrect use of the described content may cause danger and may result in personal injury or death.



Use this label when incorrect use of the described content may cause danger and may result in mild or moderate personal injury and equipment damage. However, this standard
It is something to pay attention to. Depending on the situation, it may also cause a major accident.




Indicates things that are prohibited and cannot be done.




Although some matters do not fall into the scope of [Danger] and [Caution], the matters that users are required to comply with are also marked in the relevant chapters.

Safety Precautions

- open box to check


 Notice	
Damaged drives and drives with missing parts must be Do not install	Risk of internal injury


- install **Pack**

 Notice	
Please install it on a metal plate that is not easy to burn. Do not install near combustibles	There is a risk of fire
Be sure to tighten the drive mounting screws	The mounting screws are loose, which may cause the drive to fall or someone to injured
Do not install in an environment with flammable gases	prone to explosion

Safety Precautions

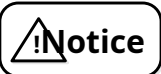
- match Wire

<div> Danger</div>	
Please make sure the power is off before wiring	Risk of electric shock and fire
When working on the main circuit terminals of the driver, be sure to cut off the power supply. 15Minutes or more, confirm that the capacitor discharge is complete before proceeding.	Risk of electric shock
Ask professional electrical engineers to perform wiring work	Risk of electric shock and fire
The ground terminal must be reliably grounded (ground resistance4Ωthe following)	Risk of electric shock and fire
It is prohibited toP/BandPEThe terminals are directly connected, and it is prohibited to connect the neutral line toPEon the terminal	Cause the rectifier bridge to short circuit and burn out the main circuit
It is prohibited to connect high-voltage lines to the control terminals of the driver	Cause the control board to burn out
Please set up emergency stop and lock circuit outside the controller	Risk of injury (responsibility for wiring lies with the user)
After turning on the power, do not touch the main circuit terminals directly	Risk of electric shock and short circuit

<div> Notice</div>	
Please confirm the main circuit AC input power supply and the rated current of the driver. Is the pressure consistent?	Risk of injury and fire
Please do not perform voltage withstand and insulation tests on the driver at will.	It will cause damage to the semiconductors and other devices inside the driver.
Please connect the external braking resistor according to the wiring diagram.	There is a risk of fire
Do not connect the AC input power cord to the main circuitU,V, Won the output terminal	Will cause internal damage to the controller
Please use appropriate torque to tighten the main circuit and control circuit of the driver. terminal	There is a risk of fire and driver malfunction.
Do not connect phase-shifting electrolytic capacitors andLC/RCThe noise filter is connected to the output loop	Will cause internal damage to the drive
Do not connect electromagnetic switches and electromagnetic contactors to the output circuit. Connecting or disconnecting the load	When the driver is running with load, surge current will cause Activate the driver's protection circuit

- Trial run

	
After turning on the power, do not touch the main circuit terminals directly	Risk of electric shock and short circuit
Confirm input and output signals to ensure work safety	System malfunction may cause casualties, as well as workpieces and surroundings. damage to equipment
Only after confirming that the enable signal is cut off can the alarm be cleared. Clearing the alarm in the enabled state will cause a sudden restart.	Risk of injury
For drives that have been stored for a long time, make sure there is no water or condensation	Risk of burning out the drive
If placed in a low temperature environment for a long time, it should be at least 0°C Leave the above environment for a period of time	Risk of burning out the drive
It is prohibited to touch the terminals and rotors of the driver with your hands during operation. moving motor shaft	There is a risk of electric shock, which may cause personal injury or death

	
The driver and motor may have a high temperature rise after starting operation. Please do not touch at will	Risk of burns
The external braking resistor will have a high temperature rise due to discharge, please do not touch it.	Risk of burns and electric shock
Do not change driver settings at will	May cause equipment damage and accidents, resulting in danger
Please pay attention to the modification of internal parameters during operation and other operations.	Operation errors may cause equipment damage, accidents, and dangers.

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Chapter 1 Product Overview

1.1. Dynamic platform system overview

In this manual, MBOX Dynamic platform system refers specifically to an electric cylinder multi-degree-of-freedom platform system driven by a servo motor. It can be widely used in motion simulations, robots, aircraft space rendezvous and docking simulators, ship and automobile simulators, new processing machine tools, satellites, missiles, etc. Accurate motion simulation of aircraft, and 4D Dynamic seats, six-degree-of-freedom platforms, etc. are indispensable and important equipment for national defense and military, aerospace, automobile manufacturing, machinery industry, and various complex environment testing and training.

MBOX The core of the dynamic platform system is the application of networked servo control system technology. In addition to the electromechanical actuator composed of servo motors and electric cylinders, it is mainly provided by Hollysys Motor Technology Co., Ltd. HSSeries of networked servo drives and MBOX The communication control board constitutes the core control component.

1.2. Networked servo control system

Servo is an automatic control system that enables the output controlled quantities such as the position, orientation, and state of an object to follow any changes in the input target (or given value). Its main task is to amplify, transform and regulate the power according to the requirements of the control command, so that the torque, speed and position output by the drive device can be controlled very flexibly and conveniently. Modern AC servo drives based on permanent magnet synchronous motors are developing very rapidly and widely. Their performance and functions are constantly improving and their prices are getting cheaper. They have entered large-volume and wide-ranging industrial applications from the early CNC field.

The control modes of AC servo drives are generally divided into position mode, speed mode and torque mode. For currently popular servo drives, the control interfaces that implement these three control modes are still hard-wired interfaces, namely pulse direction, digital I/O and analog mode. This hard-wired interface mode is suitable for applications with short distances and small number of units. When joint applications of dozens or even hundreds or even thousands of units are required, engineering wiring, long-distance transmission, control signal attenuation or even distortion, troublesome troubleshooting problems will follow. Under such application conditions, networked AC servo drives will become the replacement for traditional PLC. New solutions that give priority to control solutions.

The network interface of the AC servo drive is divided into high-end fast bus system and low-end general bus system. High-end bus systems, such as those of Germany's Beckhoff EtherCAT, which can provide rapid and synchronized information transmission, but the price is very high and the technology is complex, so it is not suitable for general ordinary applications. Low-end bus systems such as RS485. The system is not very real-time and has limited networking capabilities. Launched by Hollysys Electric HSA series of networked servo drives and Ethernet communication controllers have proposed a complete set of application solutions for the low-cost and high-speed requirements of servo networked applications. Through the Ethernet bus and CAN. The two-level network topology of the bus realizes high-speed, high-capacity and low-cost networking application solutions, which has been applied and verified in multiple projects.

1.3. HSSeries networked servo drives

HSThe series of networked servo drives is a new generation of cost-effective, simple-looking, practical and reliable all-digital AC servo drives launched by Beijing Hollysys Motor Technology Co., Ltd. The company is in 2009. The technical research results of AC servo spindle driver research and development carried out during the major national science and technology projects in 2016 have been authorized. 4 National patented technology (3 inventions and 1 item utility model) .



picture1-1 Senchuang H5 Series servo driver appearance

This networked servo drive adopts TI New 32-bit dual-core digital signal processing chip with floating-point computing capability, adopts a new motor control algorithm to accurately control the position, speed, acceleration and output torque of the permanent magnet synchronous servo motor. It is suitable for industrial automation industries and fields such as machining centers, CNC servo control, and textile machinery.

H5 Series of networked servo drives have the following characteristics:

- 1) Universal motion control functions: position/speed/torque control, mode switching
- 2) fast current loop floating point CLARK kernel processing, with good dynamic followability
- 3) Built-in grid voltage compensation control, automatically adapts to grid voltage fluctuations
- 4) built-in 2-selectable resonant low-pass filtering, and 2-stage resonance notch filter, effectively dealing with mechanical resonance
- 5) Built-in proprietary intelligent regenerative braking control technology
- 6) Built-in torque observer technology, automatically adapts to load changes
- 7) control gain switchable or internal adaptive matching
- 8) Built-in dynamic braking control provides additional safety protection for the drive
- 9) has an overload automatic load reduction algorithm, which can parameterize whether to select overload protection, and parameterize automatic smooth load reduction and recovery.
Repeated overload capacity
- 10) support MODBUS, RS232 and RS485 Communication interface, communicate directly with host computer and touch screen, etc.
- 11) support CANBus interface, built-in proprietary communication protocol, convenient for customer customization
- 12) The control port supports software allocation, logic settings, and programmable filtering, making it flexible, convenient and reliable to use.
- 13) Pulse analog interface, the pulse input frequency can be up to 1MHz
- 14) 2A channel of analog output can observe the internal status of the driver and facilitate on-site debugging.
- 15) Built-in power device temperature monitoring and overcurrent, overvoltage and overheating protection to ensure reliable driving
- 16) Has reliability management functions such as historical fault records

1.4. SenchuangMBOXCommunication controller

second generationMBOX-V2is a product designed forHSAAn Ethernet-based servo network control application developedCANBidirectional data transfer on the bus, containingtwenty fourdigital output,2analog output,8digital input,6analog input, andMODBUS communication monitoringRS232interface and other multi-functional application boards. one of themCANThe bus uses electrical isolation technology to ensure the reliability and safety of the bus driver.



picture1-2MBOX-V2Communication controller

1.5. HSServo drive andMBOXSingle platform dynamic platform control system

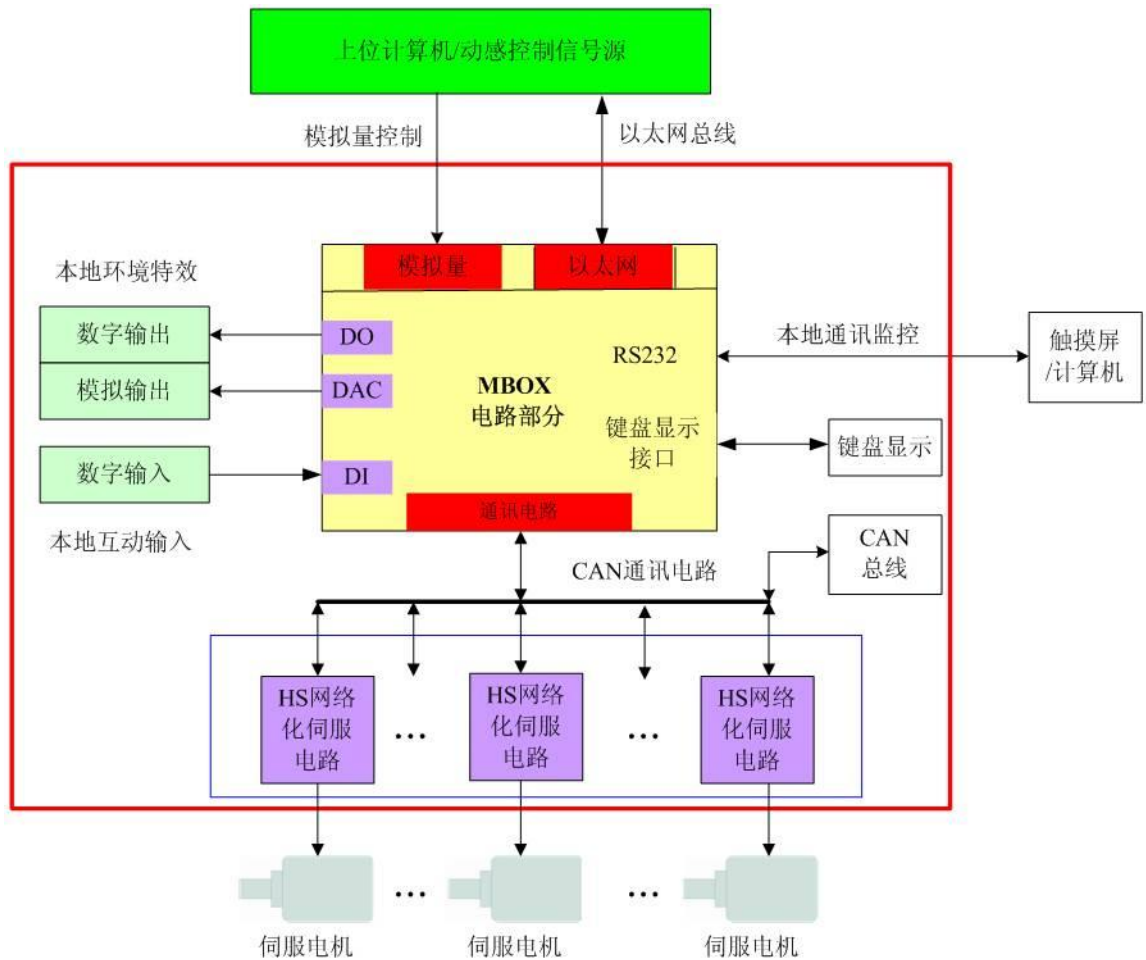
HSSeries of networked servo drives, providing3bus interfaces, includingRS232,RS485as well asCANbus. inRS232The interface is a standard configuration communication interface.RS485andCANThe bus is an optional communication interface that adopts electrical isolation and transient voltage suppression protection technology and has good electromagnetic compatibility and reliability.RS232andRS485The communication protocol of the interface is commonly used in industryMODBUS RTUprotocol.CANThe communication protocol of the bus interface is our company's independent intellectual property rights (invention patent has been obtained)CANBus communication method[2].

HSThe series of networked servo drives strengthen the control function in bus mode and supportRS232,RS485as well asCAN Multiple bus mode controls for bus interfaces, including:

- 1) Torque mode control of bus interface
- 2) Speed mode control of bus interface
- 3) Relative position mode control of bus interface
- 4) Absolute position mode control of bus interface

Standard configurationRS232Interface implementationHSPoint-to-point communication between the servo drive and the host computer or touch screen can realize HS Servo drive status monitoring, parameter reading and writing, and bus mode control are often used for parameter configuration and operation monitoring of servo drives. When the user requestsHSWhen the networked servo drive is running in a network, you can chooseRS485bus orCANbus. Generally speaking,CANThe flexibility and reliability of the bus make it more suitable for networked real-time control.MODBUSBecause communication can carry large data packets, it is more suitable for large-capacity parameter transfer and data monitoring that do not require high real-time performance.

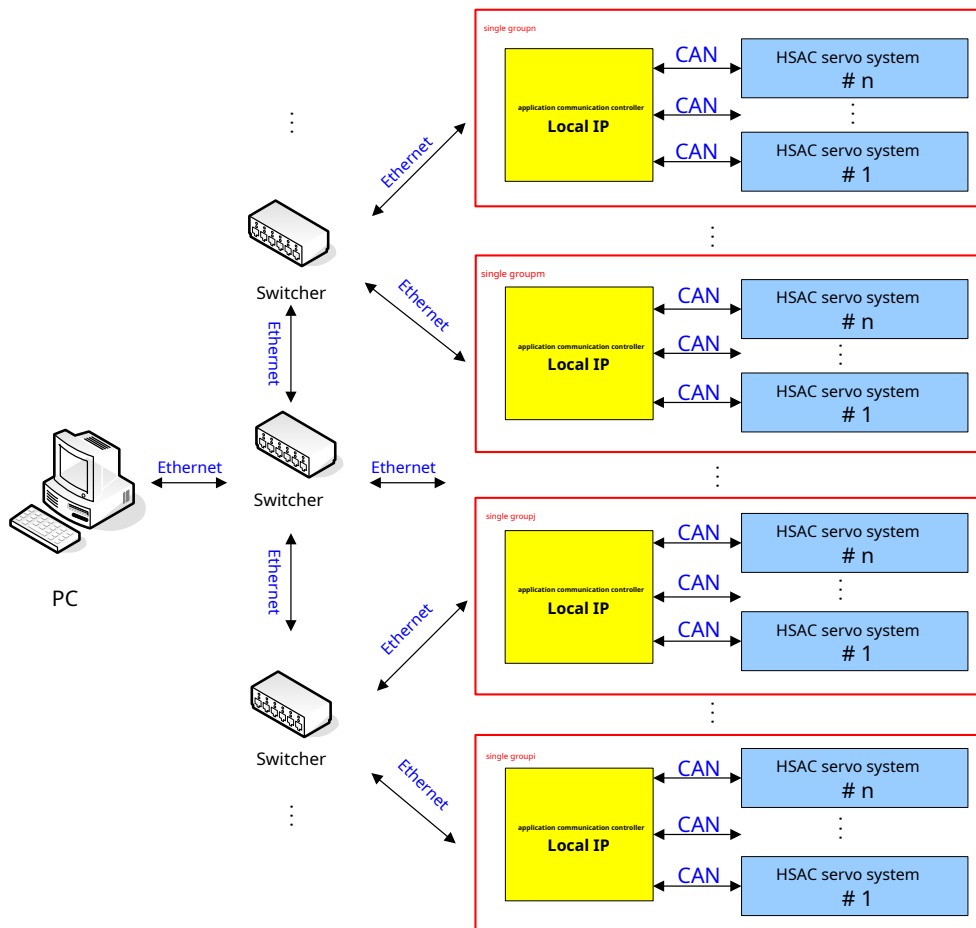
The picture below is HSUse of networked servo drives CANbus sum MBOXCommunication controllers form the typical architecture of analog or Ethernet control systems. MBOXCommunication with the host computer is achieved through Ethernet switches. MBOXandHSImplemented between servos CANBus communication, in addition, MBOXCan also be implemented with a local computer or touch screen based on RS232Waiting for interface MODBUS communication for easy monitoring and debugging. at the same time, MBOXAlso available 8digital input, twenty fourdigital output and 2Analog output interface facilitates low-cost digital and analog interface data acquisition and control through the Ethernet bus.



picture1-3HS servo CANbus networking and MBOX single platform dynamic platform control system composed of control board

1.6. Multi-platform control application solution based on Ethernet for dynamic platform

each MBOX of CAN. The maximum number of nodes on the bus is related to the transmission distance and baud rate. Common application node numbers include: 3, 6, 9, 16. The Ethernet interfaces are connected together through switches, and when the ports of one switch are not enough, they can be expanded through another switch. In the application, each MBOX allocates a ID No., the ID No. using Ethernet IP Address, for example: 192.168.1.100. each MBOX The control node constitutes, as a whole, the external connection line only needs 1 individual 220V The power cord and an Ethernet network cable greatly simplify the implementation of on-site wiring projects. In addition, Ethernet communication uses 10M/100M Implemented in an adaptive manner, it has the characteristics of high-speed data transmission, reliability and large capacity.

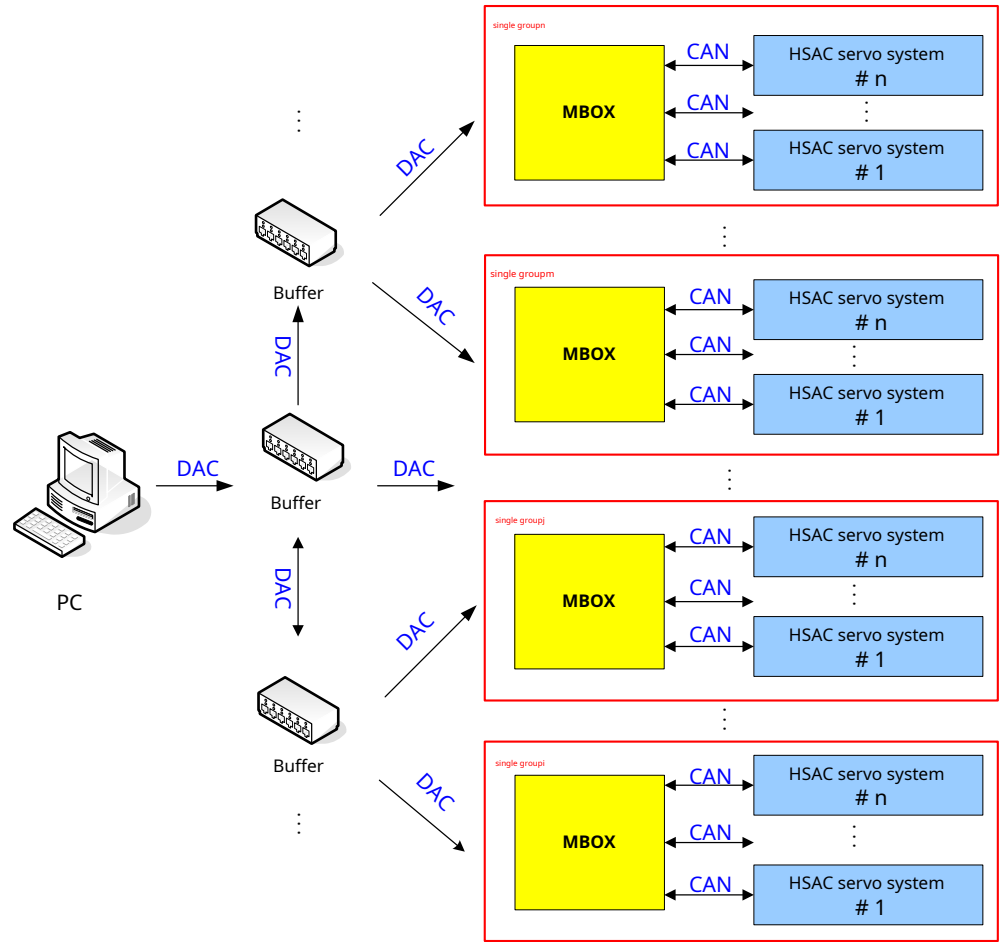


picture1-4Networked servo control solution for multiple Ethernet control nodes

1.7. Analog-based multi-platform control application solution for dynamic platform

The program is mainly easy to use DACThe host computer control technical route of board control method.

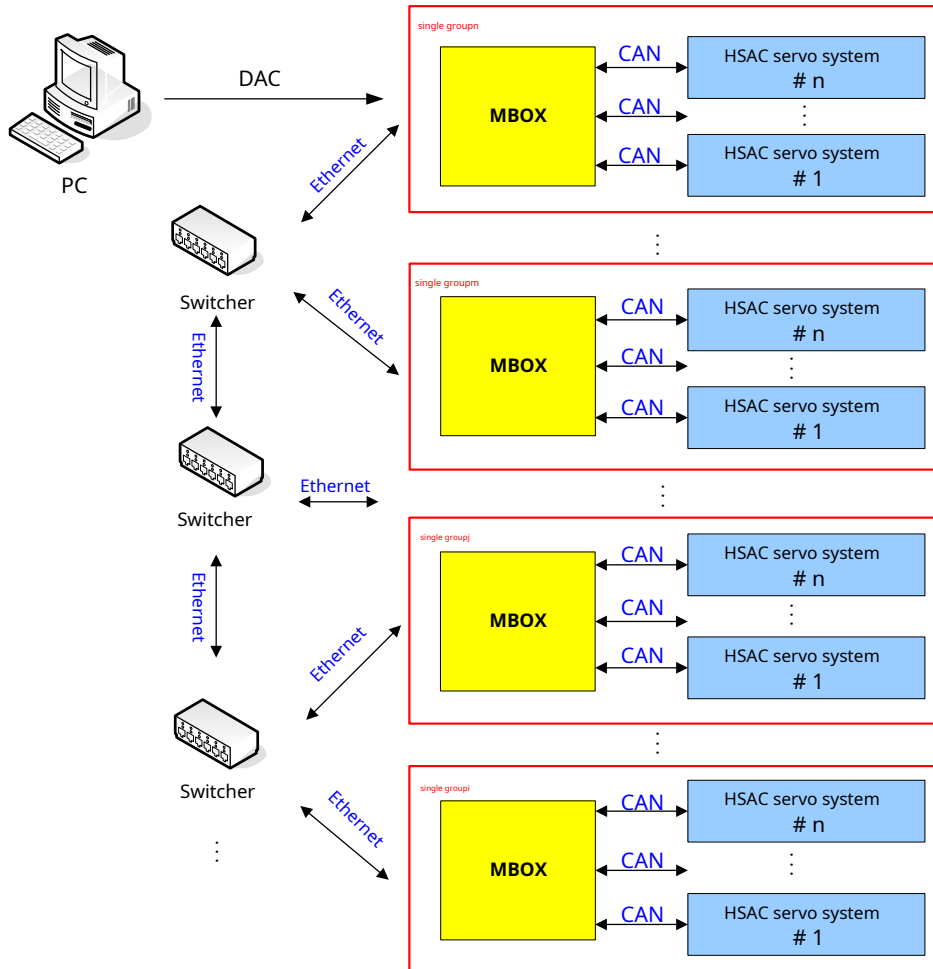
MBOXThe analog interface passes through the host computerDACThe output buffer circuits are connected together and the analog interface0~10V, the electric cylinder position corresponding to the analog quantity can be passedMBOXparameters to set. The following is an application program using analog control.



picture1-5MBOXApplication solutions for controlling nodes using analog quantities

1.8. Dynamic platform's multi-platform control application solution based on hybrid analog and Ethernet

The first one MBOX The analog interface passes through the host computer DAC The output buffer circuits are connected together and the analog interface 0~10V, working in analog interface mode MBOX Will automatically output similar to the host computer Ethernet UDP The data packet can be used for other subsequent router cascades. MBOX synchronized motion control. The advantage of this method is that it simplifies the software development work of the host computer, but at the same time retains the advantages of the Ethernet solution.



picture1-6MBOXMulti-platform control application solution based on analog and Ethernet hybrid

1.9. Dynamic platformMBOXController naming and selection

at presentMBOXDynamic platform controller support1~6Application of axis mode: Commonly used are3axis as well as6Application of axis mode.
MBOXThe controllers are named as follows:

SC-MBOX-V2-A6	
轴数	A2: 2轴 A3: 3轴 A4: 4轴 A5: 5轴 A6: 6轴 Ax: 定制
版本	设计版本号
动感平台	Motion Box
控制	Controller
森 创	和利时电机 产品品牌 SYNTRON

1.10. MBOXandHSTypical dynamic platform application cases composed of servo

As shown belowHSNetworked servo drives andMBOXTypical application of communication control board on six-degree-of-freedom platform.



picture1-7HSNetworked servo drives andMBOXCommunication control board for six-degree-of-freedom platform

For more large-scale and wide-ranging application solutions on the three-degree-of-freedom platform, HSNetworked servo drives and MBOXCommunication control boards is as follows:



picture1-8HSNetworked servo drives and MBOXCommunication control board for three-degree-of-freedom platform

1.11. summary

HSNetworked servo drives and MBOXcommunication control board CANCommunication and Ethernet technology is a solution design for customized development and application of general technology products. The advantages of this solution include:

- 1) High-speed and large-capacity communication
- 2) Networking is convenient and flexible, with high reliability
- 3) Strong scalability and simple on-site wiring
- 4) Monitoring and diagnosis are easy
- 5) The price/performance ratio is better than traditional PLC and control board solution

This solution can be widely used in industrial automation network assembly line control, using the dynamics of electric cylinders (4D/5D/7D) cinemas and six-degree-of-freedom platforms, as well as pan-industrial application fields of special effects control such as stages and fountains. The servo drive network control customized solution not only meets user needs, but also achieves the best engineering realization of technical solutions and target projects. Hollysys Electric strongly supports technology development and engineering implementation such as customized application solutions according to customer needs.

Chapter 2 Installation and Wiring of Dynamic Platform System

2.1.

HSThe servo is directly connected to the external limit sensor

In the dynamic platform system, for safety protection, the electric cylinder is usually installed at both ends.2limit sensor. The limit sensor is generally connected to the overtravel input of the servo driver to implement forward and reverse rotation prohibition protection actions to avoid overtravel use of the electric cylinder. Under normal circumstances, the upper limit sensor does not need to be connected to save costs. In this case, the user can also setMBOX The soft limit parameters of the electric cylinder are used to achieve soft protection.

In some application engineering practices of the dynamic platform, it is hoped that completely unlimited sensors and electronic scale feedback can be achieved to simplify system implementation.MBOXThe dynamic platform controller supports the initial positioning and normal operation of the dynamic platform with completely unlimited sensors, but does not include applications under the following combinations:

1. The electric cylinder does not have the function of an anti-rotation device.
2. The electric cylinder and the moving part of the platform are connected by a ball shaft connection.

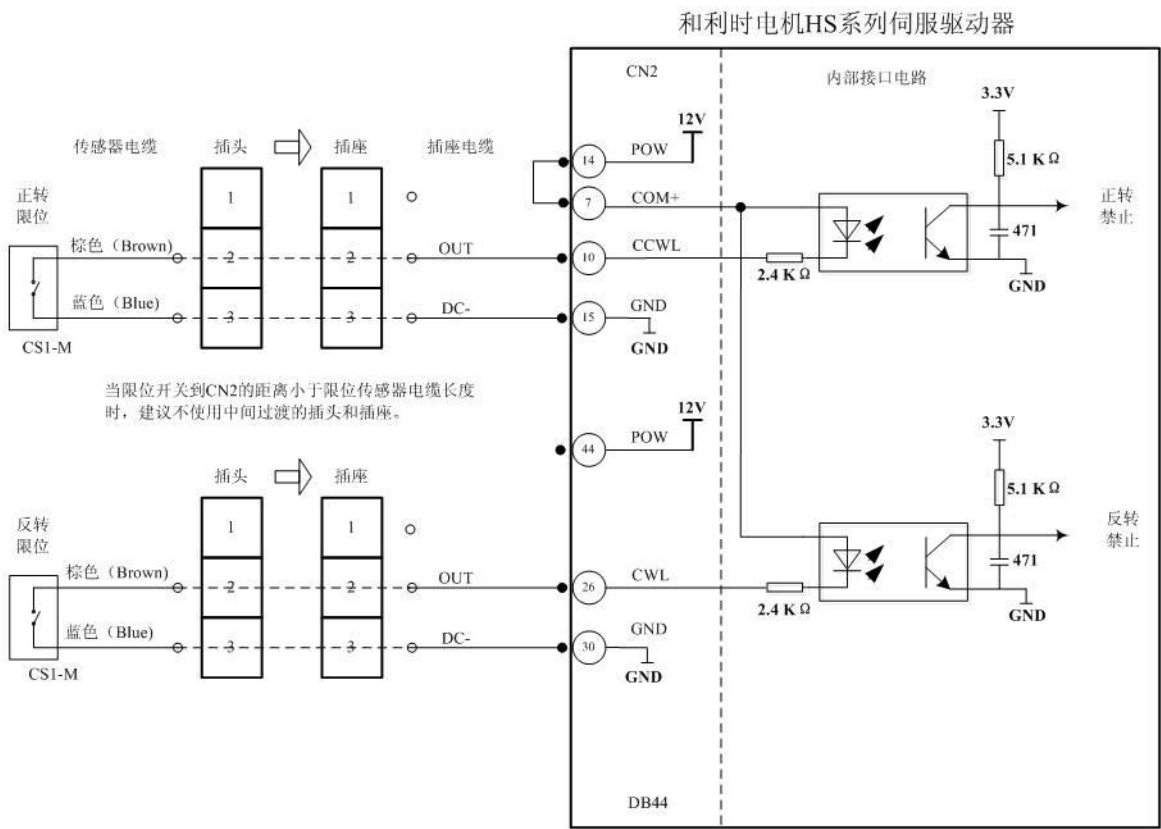
When the electric cylinder and its installation are used in the above combination, there is no repeatable positioning capability between the linear motion of the electric cylinder and the rotational motion of the motor. The reciprocating rotational motion of the motor will cause the linear motion of the electric cylinder to continuously slip in one direction and accumulate. The top cylinder situation occurs. This situation generally occurs when the electric cylinder manufacturer cancels the anti-rotation device due to cost considerations, while the electric cylinder integrated application manufacturer adopts a ball shaft connection structure. (If the connecting part adopts a fisheye structure or a universal joint structure, it will also prevent the electric cylinder from slipping and accumulating into the top cylinder).

For additional safe operation protection, or to prevent the electric cylinder from slipping and accumulating, causing the cylinder to jack up and causing damage to the driver and motor, the electric cylinder is generally installed at both ends.2limit sensor. The limit sensor is generally connected to the overtravel input of the servo driver to implement forward rotation prohibition and reverse rotation prohibition protection actions to avoid overtravel use of the electric cylinder.

When the user decides to install a limit sensor on the electric cylinder, there is no need to configure an additional external power supply. due to useHSServo drives available12V(100mApower supply within), so the external limit switch andHSThe direct connection of the servo drive eliminates the cost and wiring of external power supply.

2.1.1.Passive limit sensor connectionHSServo drive schematic diagram

The picture below shows the use ofCS1-MConnection diagram in case of passive limit switch. When the limit switch reachesCN2When the distance is less than the limit sensor cable length, it is recommended not to use intermediate transition plugs and sockets.

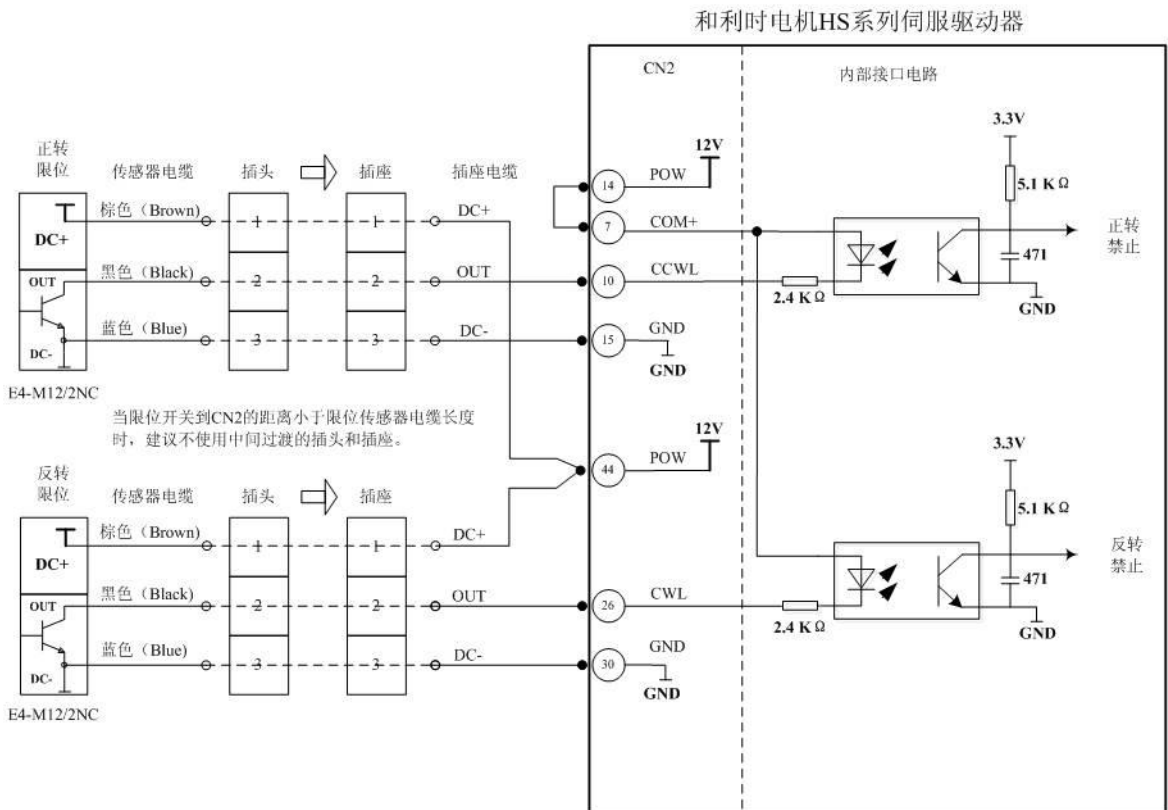


picture2-1Passive limit sensor connectionHSServer Driver

Install wiring

2.1.2.Active limit sensor connectionHSServo drive schematic diagram

The picture below shows the use of E4-M12/2NC Connection diagram in the case of active limit switches. When the limit switch reaches CN2 When the distance is less than the limit sensor cable length, it is recommended not to use intermediate transition plugs and sockets.



picture2-2Active limit sensor connectionHsserver Driver

2.1.3.Limit sensor connectionHSServo drive instructions and notes

useMBOXandHSWhen the dynamic platform system is composed of servo, it is allowed to connect only the lower limit sensor or completely unlimited sensor mode. It can effectively reduce the cost of dynamic platform systems and significantly improve reliability.

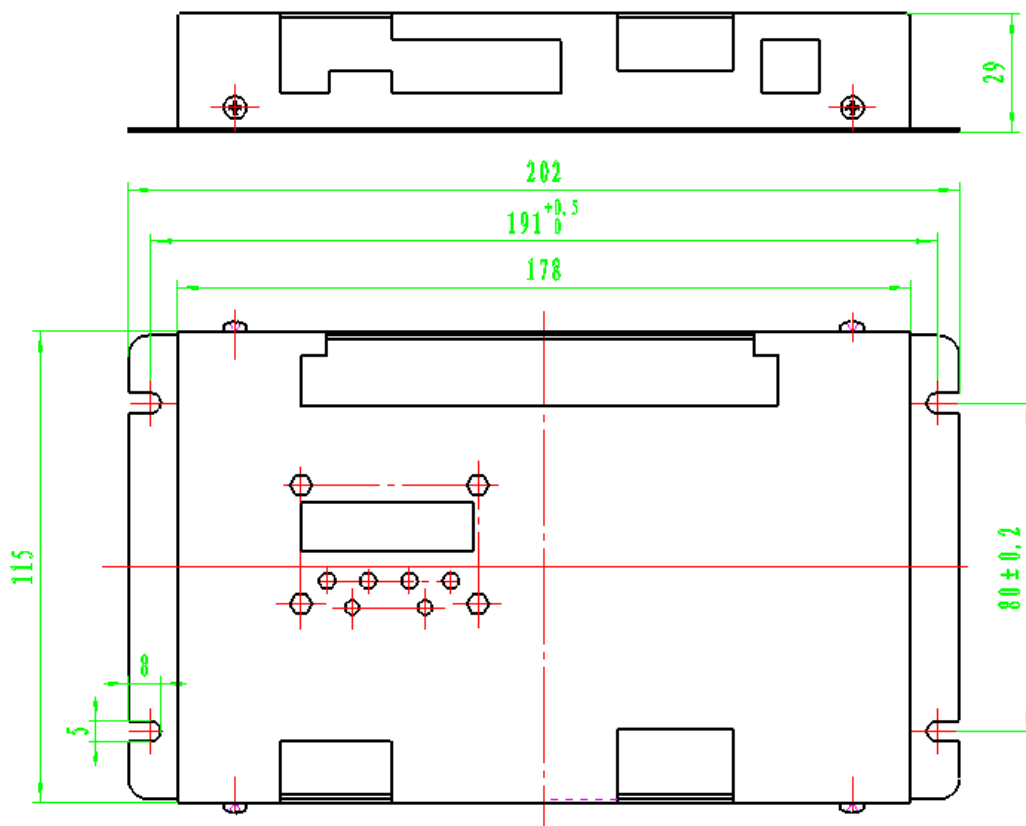
2.2. MBOX-V2Communication controller

MBOX is a product based on DSPA multi-functional interface application circuit board built with a chip as the core. Equipped with Ethernet interface, CAN bus and RS232 interfaces, as well as digital input and output functions, etc.

second generation version MBOX-V2 The physical diagram and the interface functions of each port part are shown below.



picture2-3MBOX-V2Physical picture of the appearance of the shell



picture2-4MBOX-V2Installation dimension drawing

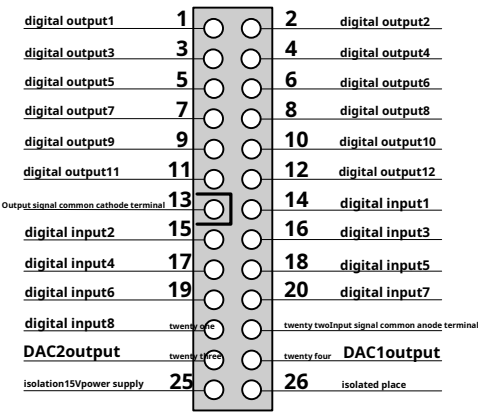
2.2.1.Input and output portsIO

Input and output ports include 2 ports: IO1 and IO2. in:

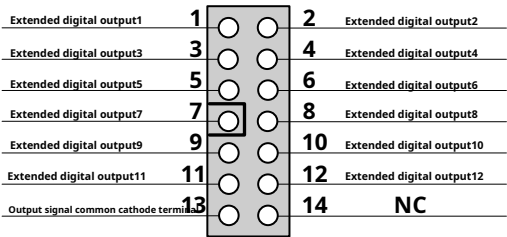
IO1 include 12 isolated digital output, 8 way isolated digital inputs as well as 2 isolated analog output IO2

Includes additional extensions 12 isolated digital output

The signal interface is defined as follows:



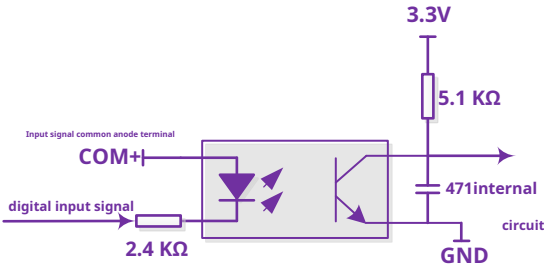
picture2-5Universal input and output interfaceIO1Schematic diagram



picture2-6Extended input and output interfaceIO2Schematic diagram

A.Digital input signals use common anode (standard models use common anode wiring, optional customization uses common cathode wiring) optocoupler isolation

The plan has been connected in series internally.2.4 kΩThe current limiting resistor can satisfy the use of12V~24VThe power supply interface is required. When the optocoupler of the digital input is turned on, the input physical signal is defined as1(or high/H) .



picture2-7MBOXDigital input interface

Install wiring

B.The digital output signal usesOCOptocoupler isolation solution, maximum drive capacity of optocoupler output:DC30V/DC50mA.

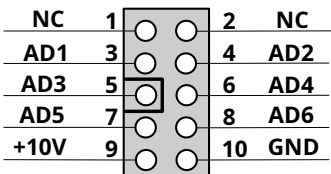


picture2-8MBOXDigital output interface

C.MBOXSupport two-way isolationDACOutput,CN2Isolation in interfaces15VPower supply and isolated groundDACof Power supply.DACOutputs can be used for Ethernet remote analog control andMBOXObservation of internal states,DACThe output range is0V~+10V.

2.2.2. ADAnalog port definition

ADAnalog ports are used to support based on0~10VDynamic platform control with analog interface. Can support up to6Road analog is used for6 Freedom platform.



picture2-9Analog input interfaceADSchematic diagram

pin port	Pin definition	illustrate
1	NC	Internally reserved and prohibited from use by users
2	NC	
3	AD1	six routes0~10V Analog position input signal
4	AD2	
5	AD3	
6	AD4	
7	AD5	
8	AD6	
9	+10V	provided externally10VReference power supply
10	GND	

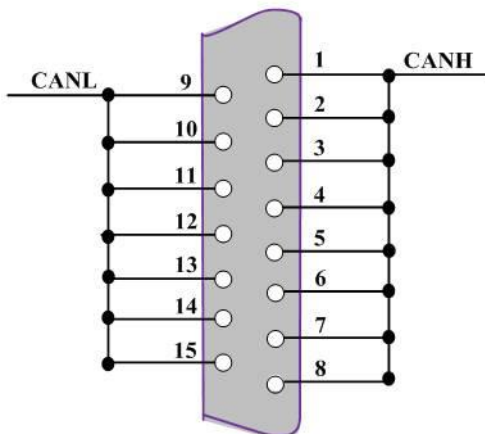
2.2.3. CANbus interface

MBOX-V2have2core interfaceCAN1port, which can be expanded through an external communication portCOM-EXT-X (X=3or6) for cascading expansion.

To facilitate direct connection of the servo driveCANbus interface,MBOX V2Also providedDBPort formCAN2port. CAN1andCAN2ofCANH(orCANL) is the same signal inside the circuit board.

In the signal annotation, "L"means low (CAN_L), "H"means high (CAN_H) ；

Note: inMBOXInternally, already installed2individual120OhmicCANBus matching resistor. No additional configuration is required by the user.



picture2-10 CANCommunication InterfaceCAN2Schematic diagram

2.2.4.Ethernet port

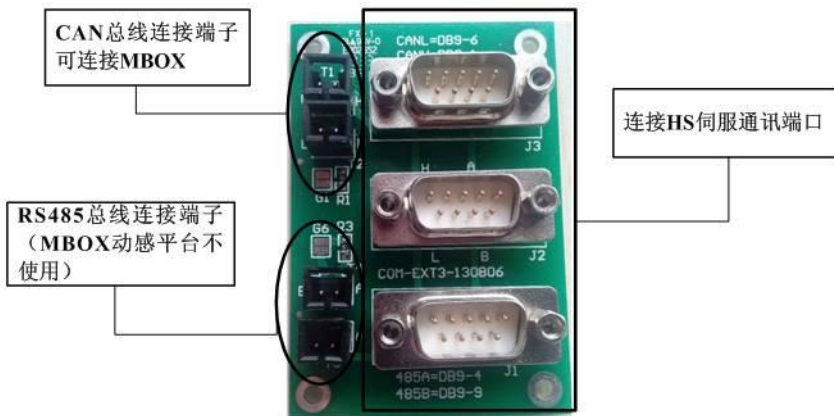
MBOXSupport standard10/100MStandard Ethernet interface, the same as the standard Ethernet used in computersRJ45interface.

2.2.5.power port

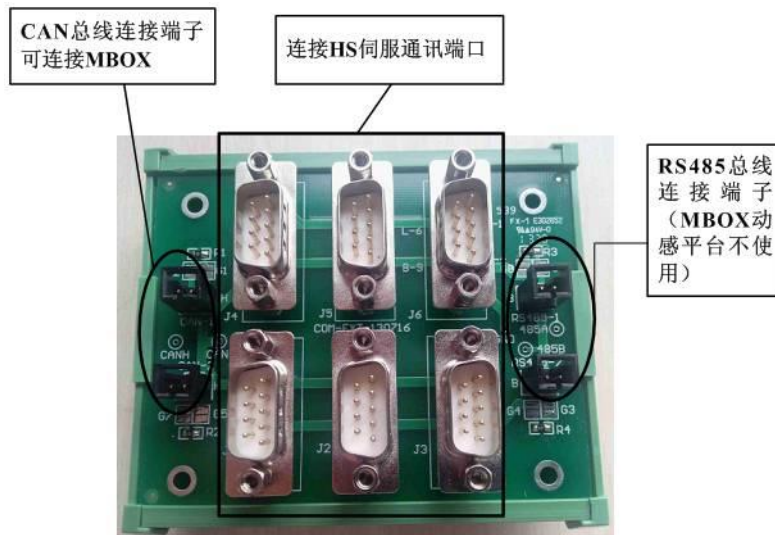
POW: Power port, user provided24V DCJust enter it.

2.3. COM-EXTPort usage

for convenienceMBOXcircuit board withHSservo drive for communication connection, specially designed to provideCOM-EXT-3and COM-EXT-6respectively used for3axis dynamic platform and6axis dynamic platform.



picture2-11 COM-EXT-3

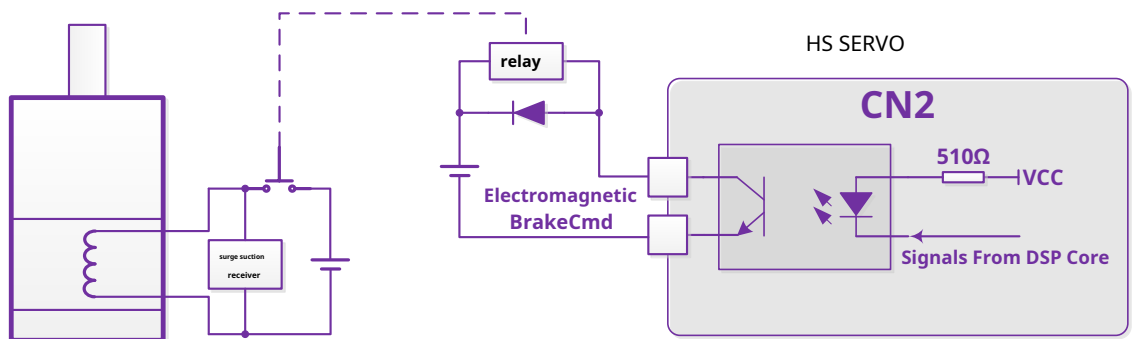


picture2-12 COM-EXT-6

2.4. HSServo external electromagnetic brake (brake) relay

In the application of medium and large dynamic platforms, in order to prevent the platform from falling due to gravity (or external force) when the servo motor is not powered on, powered off or malfunctioned, it is necessary to use a servo with an electromagnetic brake (brake). motor.

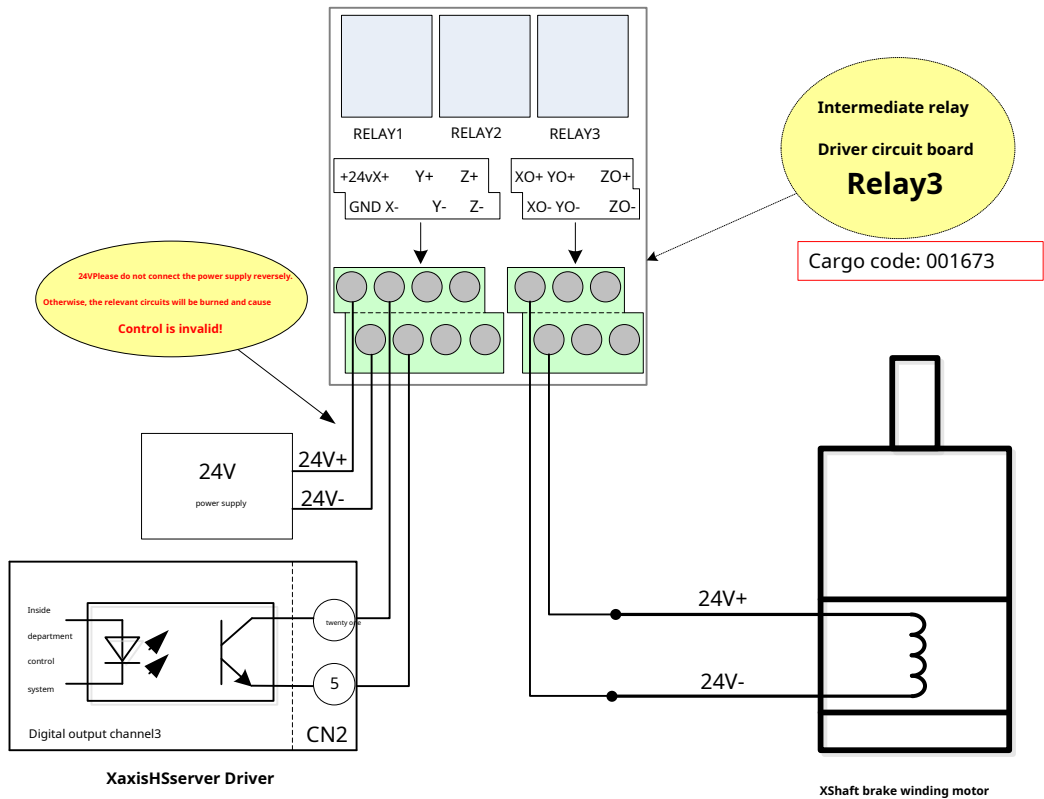
useHSWhen the series servo driver controls the electromagnetic brake, theHSServoCN2portSignalOut 1~4Any digital output signal port is configured with electromagnetic brake control (BRK-OFF) signal, and controls the on and off of the motor brake coil through an external relay and power supply to achieve the purpose of controlling the electromagnetic brake, as shown in the figure below.



picture2-13HSPrinciple diagram of external electromagnetic brake control of servo drive

for convenienceHSUsers of series servo drives can directly connect and control the electromagnetic brake. Our company has developed a matching3 Intermediate relay driver circuit board. As shown in the figure below: useXAxis servo drive digital output channel3, to achieve controlX Electromagnetic brake for shaft brake winding motors. Because it is usingHSServo digital output channel3used for electromagnetic braking, therefore, it is also necessary toHSServo Fn_032The parameters are configured as -7(Electromagnetic brake release, seeHSServo user manual: Chapter corresponding to the allocation of user output signal ports).

This relay circuit board provides a total of 3 intermediate relay drive, can also be used for intermediate relay drive in general-purpose situations.



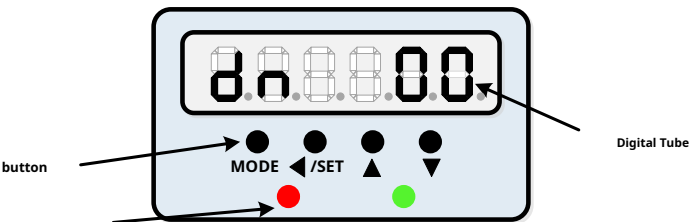
picture2-14useHSServo drive digital output channel3Control brake winding connection example diagram

Remark:

HSFor the digital output configuration of series servo drives, please refer to "Full Digital AC Servo Drives"HSSeries User Manual".

third chapter keyboard display interface

3.1.Panel display



picture3-1Diagram of the operation panel

As shown in the picture, the operation panel mainly consists of 2-bit indicator light, 4-bit keys and 6-bit digital display tube. Indicator light with digital tube indication shows the current running status, the buttons are used to select and edit parameters. The digital tube is used to display the current operating status, function codes and parameter values. The numerical and alphabetical display comparison table is as follows.

number	1	2	3	4	5	6	7	8	9	0	decimal point	
Character	A	b	c	d	E	F	G	H	J	L	n	o
mother	P	q	r	S	T	U	V	y	Null	-		

3.2.Panel description

The digital tube display interface is divided into three layers: current running status interface, function code selection interface (including "Fn xxx" configuration parameters and "Dnxx" state parameters) as well as parameter observations ("Dnxx" status parameter value) edit ("Fn xxx" Configuration parameter value) interface, please refer to the following table for descriptions of each layer interface. The three-layer interface can be switched by pressing buttons.

[Note] Indicates that the current bit is flashing.

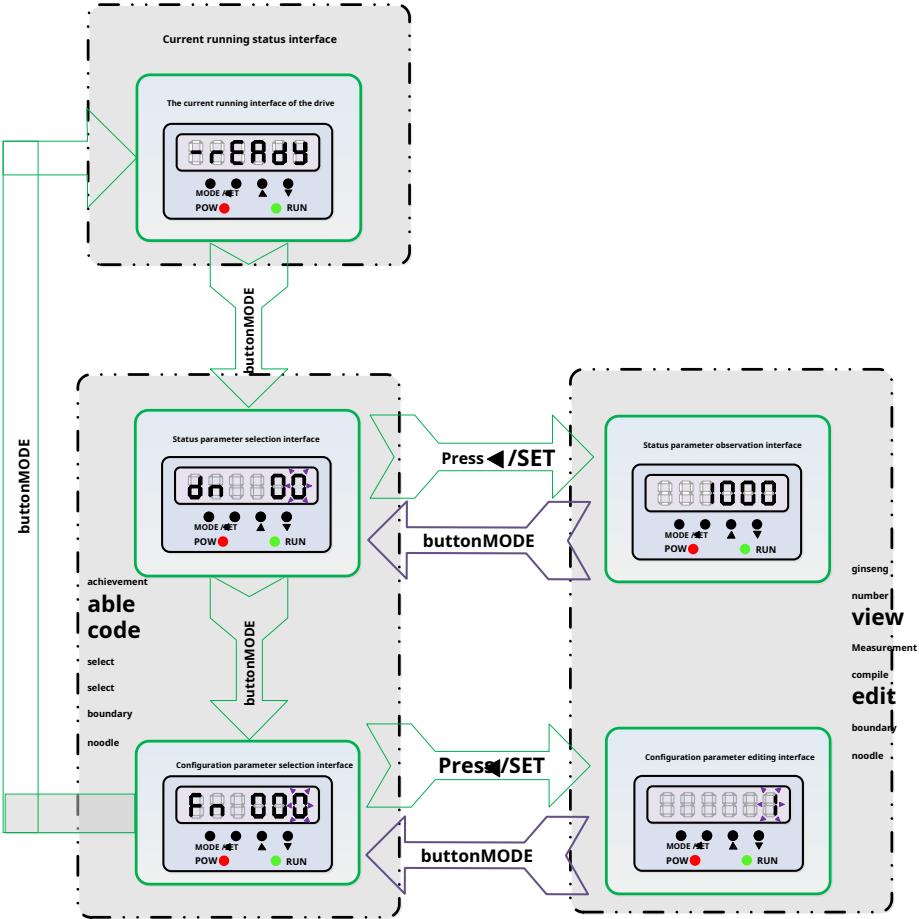
serial number	Show category	show definition	explain	bright
1	currently running status interface	Default state	MBOXThe self-test is completed, butCANtotal Line connection not established	CANBus connection established, dynamic flat station waiting to run
			When the dynamic platform is running, the current Previous runtime value or number of frames	When a fault warning occurs, the current alarm code
2	function code Select interface	status parameters		
		Configuration parameters		
3	Parameter observation	state parameter observations		
	Editing interface	Configuration parameter edit value		

surface3-1 Digital tube display instructions

3.3.Indicator light display description

The different states of the red and green indicator lights representMBOXThe different operating states of the dynamic platform are detailed in the table below:

indicator light	definition	Instructions
red	Ethernet indicator light	Off: Ethernet connection not established Lit: Ethernet connection established
green	Operating status indicator light	Off: The dynamic platform is in initial positioning Lit: The initial positioning of the dynamic platform is completed and waiting to run Slow flashing: The dynamic platform is running Flash Mob: Dynamic PlatformMBOXFault



picture3-2 Switching between digital tube display interfaces

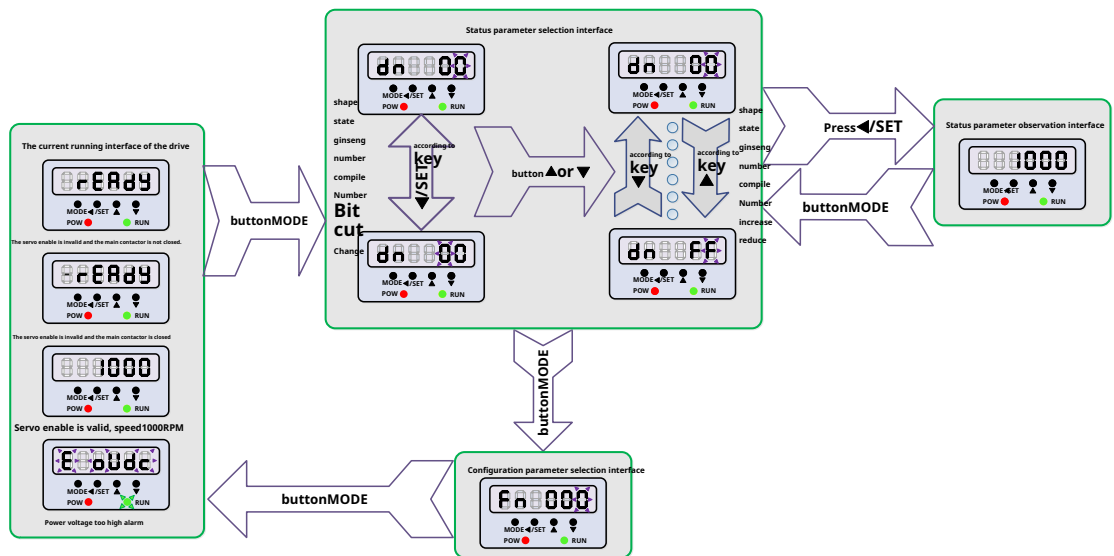
3.4.Button function definition

Buttons are provided for users to select, observe, and edit parameters. The specific definitions are shown in the table below.

button	definition	Instructions
MODE	interface switch	Switch between "current running status interface", "status parameter selection interface" and "configuration parameter selection interface" When observing or editing the internal parameters of the drive, it is used to return to the "Function Code Selection Interface" from the "Parameter Observation Editing Interface"
↵/SET	confirm & shift	In the "Function Code Selection Interface" and "Configuration Parameter Editing Interface", press the button normally and briefly to select the function code and the digital digit of the parameter value that need to be modified. At the same time, the "digit" selected for modification flashes. In the "Function code selection interface", if a parameter number is selected, keep pressing the key 1 seconds to enter the "Parameter Observation Editing Interface" In the "Configuration Parameter Editing Interface", keep pressing the key 1 seconds to confirm and save the modified parameter values.
▲	Increment button	In the "Function Code Selection Interface" and "Configuration Parameter Editing Interface", the flashing "bit" selected for modification is incremented by "1" to increase the digital value of the flashing "bit"
▼	Decreasing button	In the "Function Code Selection Interface" and "Configuration Parameter Editing Interface", the flashing "bit" selected for modification is incremented by "-1" to reduce the number of flashing "bits" of a digital value

3.5.Query status display example

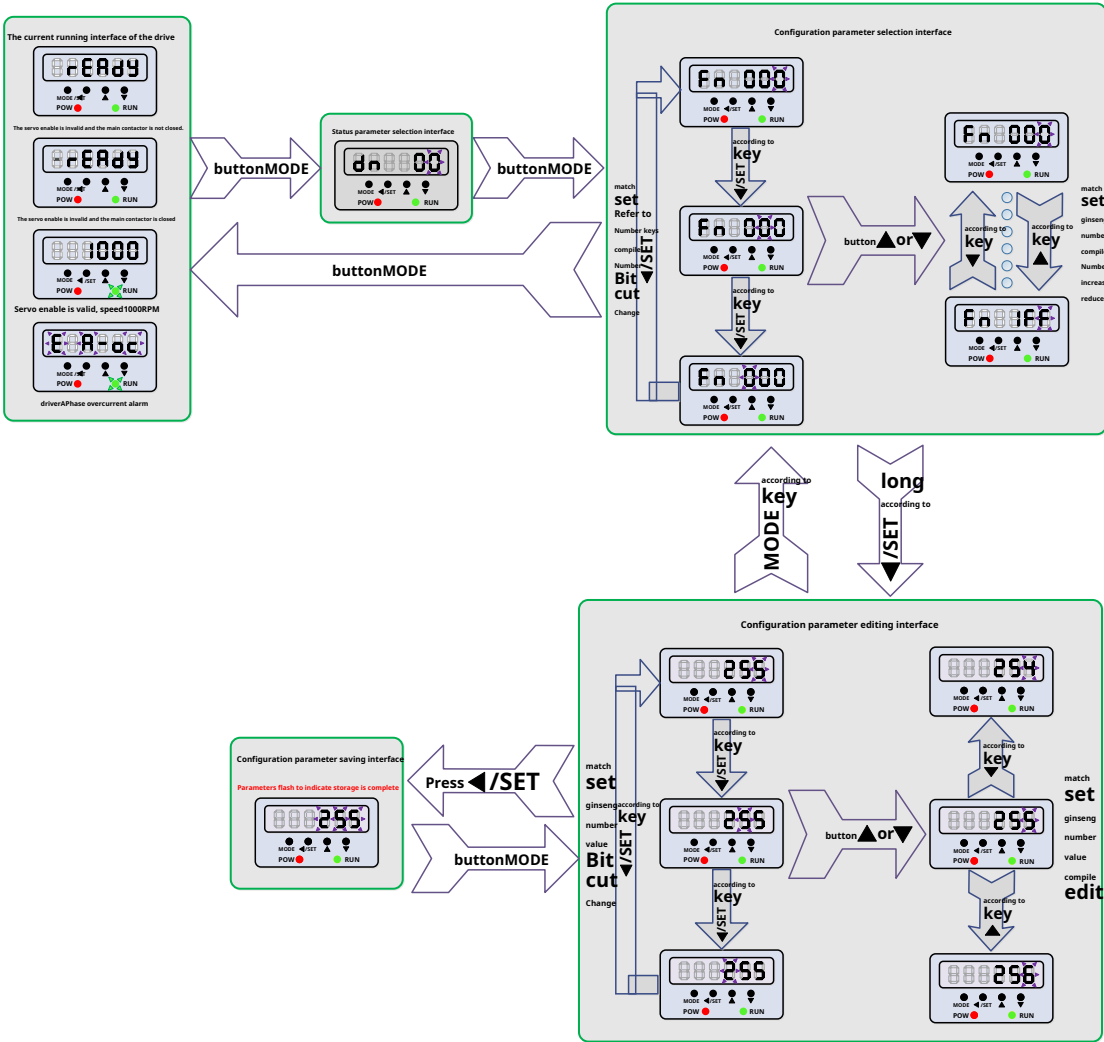
MBOXThe system status starts with "Dnxx" For identification, during debugging, you can pass "Dnxx" State parameters observe the state values of interest.



picture3-3General diagram of query status

3.6.Query edit parameter example

MBOXThe configuration parameters start with "Fn xxx"for identification, after purchasing the product, the user needs to set the relevant configuration parameters according to different applications. The following figure is a general example of querying and editing configuration parameters.



picture3-4 General diagram of querying and editing configuration parameters

Chapter 4 Ethernet bus communication protocol

4.1. MBOXEthernet communication overview

This system uses Ethernet LAN+CANThe bus control solution realizes networked servo control of the dynamic platform. in,MBOXEthernet data communication adoptsUDPPProtocol.

4.2.MBOXEthernet communication protocol

Introduced belowMBOXThe basic framework and specific communication protocols of Ethernet communication.

4.2.1.MBOXBasic framework of Ethernet communication

Ethernet data communication adoptsUDPPProtocol,UDPThe basic format is as follows. passMACAddress,IP address, as well as user-specificUDPThe source port number and destination port number implement flow control of Ethernet data. The control information of dynamic platform interaction is inUDPReflected in the data part.

MAC Header (14 Bytes)									
DA			SA				TYPE		
\$.\$.\$.\$.\$.			\$.\$.\$.\$.\$.				0x0800		

IP Header (20 Bytes)									
Ver	Diff	Total	ID	Flag	TTL	Protocol	Check	Souce	Destination
HeadLength	Services	Length		Offset		Type	Sum	IP	IP
0x45	\$	\$. \$	\$. \$	\$. \$	\$	0x11	\$\$	\$. \$. \$. \$	\$. \$. \$. \$

UDP Header (8 Bytes)			
Source Port	Destination Port		CheckSum
\$. \$	\$. \$		\$. \$

UDP Data		
AppControlField	AppWhoField	AppDataField
\$. \$. \$. \$. \$. \$. \$	\$. \$. \$. \$	\$. \$. \$. \$

MAC Frame Check Sequence (4 Bytes)			
\$. \$. \$. \$			

4.2.2.MBOXEthernet information transmissionUDPdata method

This communication method can realize point-to-point interaction and broadcast communication, as well as point-to-multipoint interaction and broadcast communication.MACAddress,IPAddress, port number to address. whenMACAll addresses are6individualFFWhen , it means physical address broadcast; whenIPThe segment address is4individualFFWhen , it means logical address broadcast.

In this article, Ethernet'sUPDThe data part is divided into3subdomains, respectively application control domains (AppControlField)application handler domain (AppWhoFiled) and the application data domain (AppDataField) .

UDP Data		
AppControlField	AppWhoField	AppDataField

The application control domain (AppControlField) is used for UDP Data message proceeds: Confirm (Confirm Code), encryption (PassCode), function selection (FunctionCode), object channel selection (ObjectChannel). As shown in the table below.

AppControlField			
Confirm	Pass	Function	Object
Code	Code	Code	Channel

The application handler domain (AppWhoField) is used to identify the recipient of the message. MBOX How to deal with it.

AppWhoField	
Who	Who
Accept	Reply
\$. \$	\$. \$

\$. in the table is used to represent 1 bytes of data. \$. \$ means 2 bytes of data, and so on. General, application handler domain WhoAccept The encoding is used to identify the recipient of the message and indicates the location selection of rows and columns. asff.ff When , it means full reception; xx.ff: Indicates column reception; ff.xx: Indicates row reception; xx.yy: Indicates point reception, 00.00 In the message sent by the broadcast computer master station, it is indicated that it does not need to be received; in MBOX The messages sent from the slave station only need to be received by the broadcasting computer master station.

General, application handler domain WhoReply The code used to identify the responder of the message indicates the row and column position selection. asff.ff When , it means full response; xx.ff: Indicates column response; ff.xx: Indicates line response; xx.yy: Indicates point response. 00.00 In the message sent by the broadcast computer master station, it is indicated that no response is required;

Through the row and column position information of different application processor fields, the playback computer can realize multiple MBOX The matrix combination consists of information interaction in full mode, row mode, column mode, and point mode in question and answer mode or broadcast mode.

Application data field (AppDataField) indicates the corresponding data information when selecting different function codes. MBOX supported UDP The basic operations of function codes and application data fields in data communication are as follows:

- 1) MBOX Proactively report specified status information
- 2) Playback computer master station reads MBOX Register operations
- 3) Playback computer master station writes MBOX Register operations
- 4) broadcast computer main station delivery MBOX Play data information

4.2.3. MBOX Proactively report specified status information

when MBOX During operation monitoring, when situations such as timing or failure that require active alarm occur, the operating status will be reported to the Ethernet master station.

The reported data is: DX Starting address + DX Data length. The starting address and data length are given by MBOX correspond FX Parameters to set, please refer to the chapter 1.5.6.

UDP Data								
AppControlField				AppWhoField		AppDataField		
Confirm	Pass	Function	Object	Who	Who	RegStart	Reg	Reg
Code	Code	Code	Channel	Accept	Reply	Address	Num	Data
\$. \$	\$. \$	\$. \$	\$. \$	\$. \$	\$. \$	\$. \$	\$. \$	\$. \$
0x55aa	0x0000	ReportReg	0:DX	0: Host	0:None	XX	XX	X..X
		0x1001		X: Don't Care	X: Don't Care			

4.2.4.readMBOXRegister operations

host requestUDPData Format

UDP Data								
AppControlField				AppWhoField		AppDataField		
Confirm	Pass	Function	Object	Who	Who	RegStart	Reg	Extra
Code	Code	Code	Channel	Accept	Reply	Address	Num	Data
\$. \$	\$. \$	\$. \$	\$. \$	\$. \$	\$. \$	\$. \$	\$. \$	\$. \$
0x55aa	0x0000	ReadReg	0:DX	0:None	0:None	XX	XX	X..X
		0x1101	1: FX	ff.ff:All	ff.ff:All			
				ff.xx:Num	ff.xx:Num			
				xx.ff:Group	xx.ff:Group			
				Mid: Me	Mid: Me			

MBOXCorrect answerUDPData Format

UDP Data								
AppControlField				AppWhoField		AppDataField		
Confirm	Pass	Function	Object	Who	Who	RegStart	Reg	Reg
Code	Code	Code	Channel	Accept	Reply	Address	Num	Data
\$. \$	\$. \$	\$. \$	\$. \$	\$. \$	\$. \$	\$. \$	\$. \$	\$. \$
0x55aa	0x0000	ReadReg RightReply	0:DX	0:Host	0:None	XX	XX	X..X
		0x1102	1: FX					

MBOXError responseUDPData Format

UDP Data								
AppControlField				AppWhoField		AppDataField		
Confirm	Pass	Function	Object	Who	Who	RegStart	Reg	Error
Code	Code	Code	Channel	Accept	Reply	Address	Num	Code
\$. \$	\$. \$	\$. \$	\$. \$	\$. \$	\$. \$	\$. \$	\$. \$	\$. \$
0x55aa	0x0000	ReadReg FalseReply	0:DX	0:Host	0:None	XX	XX	X..X
		0x1103	1: FX					

4.2.5.writeMBOXRegister operations

host requestUDPData Format

UDP Data								
AppControlField				AppWhoField		AppDataField		
Confirm	Pass	Function	Object	Who	Who	RegStart	Reg	Reg
Code	Code	Code	Channel	Accept	Reply	Address	Num	Data
\$. \$	\$. \$	\$. \$	\$. \$	\$. \$	\$. \$	\$. \$	\$. \$	\$. \$
0x55aa	0x0000	WriteReg	0: FXm	0:None	0:None	XX	XX	X..X
		0x1201	1: FX	ff.ff:All	ff.ff:All			
			2: CX	ff.xx:Num	ff.xx:Num			
				xx.ff:Group	xx.ff:Group			
				Mid: Me	Mid: Me			

MBOXCorrect answerUDPData Format

UDP Data								
AppControlField				AppWhoField		AppDataField		
Confirm	Pass	Function	Object	Who	Who	RegStart	Reg	Reg
Code	Code	Code	Channel	Accept	Reply	Address	Num	Data
\$. \$	\$. \$	\$. \$	\$. \$	\$. \$	\$. \$	\$. \$	\$. \$	\$. \$
0x55aa	0x0000	WriteReg	1: FX	0:Host	0:None	XX	XX	X..X
		RightReply	2: CX					

MBOXerror responseUDPData Format

UDP Data								
AppControlField				AppWhoField		AppDataField		
Confirm	Pass	Function	Object	Who	Who	RegStart	Reg	Error
Code	Code	Code	Channel	Accept	Reply	Address	Num	Code
\$. \$	\$. \$	\$. \$	\$. \$	\$. \$	\$. \$	\$. \$	\$. \$	\$. \$
0x55aa	0x0000	WriteReg	1: FX	0:Host	0:None	XX	XX	X..X
		FalseReply	2: CX					

one of themFXRepresents parameter register;CXRepresents the control register: it can control the running operation of playback, fault reset, etc.;

FXmIndicates modifying the parameter register, but does not perform the power-off save function.

4.2.6.MBOXPlay absolute time data operation (3axis platform mode)

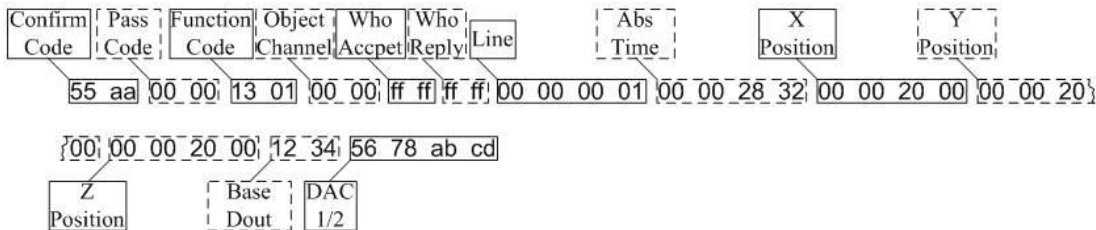
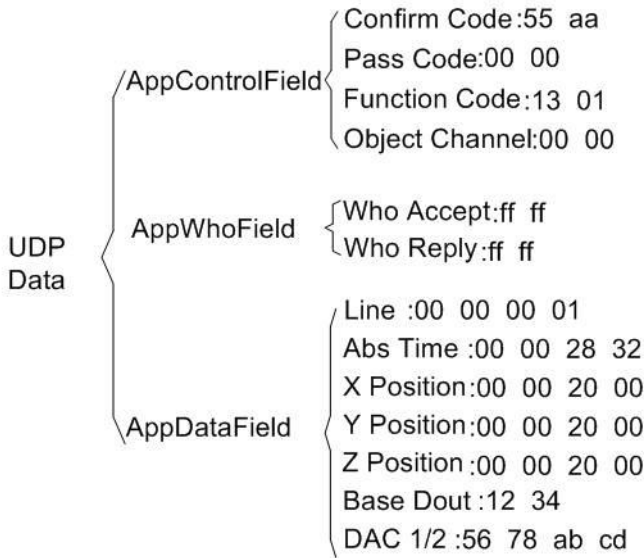
MBOXThe function code for playing position data in absolute time format is:1301;3The object channel corresponding to the axis dynamic platform is

0.

1.Host sendsUDPData Format

UDP Data											
AppControlField				AppWhoField		AppDataField					
Confirm	Pass	Function	Object	Who	Who	Line.	Abs Time	XYZ	Base	DAC	Ext
Code	Code	Code	Channel	Accept	Reply			Position	Dout	1/2	Dout
\$. \$	\$. \$	\$. \$	\$. \$	\$. \$	\$. \$	L.	L.	L..LL	\$. \$	\$. \$. \$. \$	\$. \$
0x55aa	0x0000	AbsTime	0:3Shaft mold	0:None	0:None	L.	L.	LLL	XX	\$. \$. \$. \$	XX
		PlayAll	Mode								
		0x1301		ff.ff:All	ff.ff:All						
				ff.xx:Num	ff.xx:Num						
				xx.ff:Group	xx.ff:Group						
				Mid: Me	Mid: Me						

MBOXPlay absolute time data operation (3axis platform mode)UDP DataExample



2.MBOXCorrect answerUDPData Format

UDP Data											
AppControlField				AppWhoField		AppDataField					
Confirm	Pass	Function	Object	Who	Who	Line.	Abs Time	XYZ	Base Dout	DAC 1/2	Ext Dout
Code	Code	Code	Channel	Accept	Reply			Position			
\$. \$	\$. \$	\$. \$	\$. \$	\$. \$	\$. \$	L.	L.	L..LL	\$. \$	\$. \$. \$. \$	\$. \$
0x55aa	0x0000	AbsTime PlayAllRight	0:3Shaft mold Mode	0:Host	0:Host	L.	L.	LLL	XX	\$. \$. \$. \$	XX
		0x1302									

3.MBOXError responseUDPData format (error reason: internal buffer full)

UDP Data											
AppControlField				AppWhoField		AppDataField					
Confirm	Pass	\$. \$	Object	Who	Who	Line	Abs Time	XYZ	Base Dout	DAC 1/2	Ext Dout
Code	Code	XX	Channel	Accept	Reply			Position			
\$. \$	\$. \$	\$. \$	\$. \$	\$. \$	\$. \$	L.	L.	L..LL	\$. \$	\$. \$. \$. \$	\$. \$
0x55aa	0x0000	AbsTime PlayAllErr1	0:3Shaft mold Mode	0:Host	0:Host	L.	L.	LLL	XX	\$. \$. \$. \$	XX
		0x1303									

4.MBOXError responseUDPData format (error reason: insufficient data length of data frame)

UDP Data											
AppControlField				AppWhoField		AppDataField					
Confirm	Pass	\$. \$	Object	Who	Who	Line	Abs Time	XYZ	Base Dout	DAC 1/2	Ext Dout
Code	Code	XX	Channel	Accept	Reply			Position			
\$. \$	\$. \$	\$. \$	\$. \$	\$. \$	\$. \$	L.	L.	L..LL	\$. \$	\$. \$. \$. \$	\$. \$
0x55aa	0x0000	AbsTime PlayAllErr2	0:3Shaft mold Mode	0:Host	0:Host	L.	L.	LLL	XX	\$. \$. \$. \$	XX
		0x1304									

4.2.7.MBOXPlay absolute time data operation (6axis platform mode)

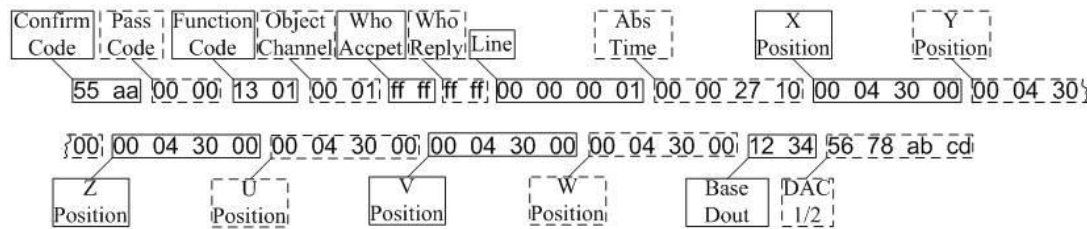
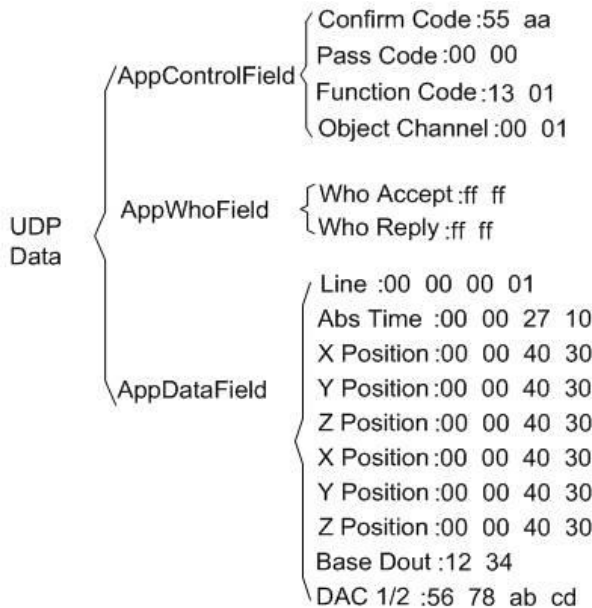
MBOXThe function code for playing position data in absolute time format is:1301;6The object channel corresponding to the axis dynamic platform is

0.

1.Host sendsUDPData Format

UDP Data											
AppControlField				AppWhoField		AppDataField					
Confirm	Pass	Function	Object	Who	Who	Line.	Abs Time	XYZUVW	Base Dout	DAC 1/2	Ext Dout
Code	Code	Code	Channel	Accept	Reply			Position			
\$. \$	\$. \$	\$. \$	\$. \$	\$. \$	\$. \$	L.	L.	LLLLLL	\$. \$	\$. \$. \$. \$	\$. \$
0x55aa	0x0000	AbsTime PlayAll	1:6Shaft mold Mode	0:None	0:None	L.	L.	LLLLLL	XX	\$. \$. \$. \$	XX
		0x1301		ff.ff:All	ff.ff:All						
				ff.xx: Num	ff.xx: Num						
				xx.ff: Group	xx.ff: Group						
				Mid: Me	Mid: Me						

MBOXPlay absolute time data operation (6axis platform mode)UDP DataExample



2.MBOXCorrect answerUDPData Format

UDP Data											
AppControlField				AppWhoField		AppDataField					
Confirm	Pass	Function	Object	Who	Who	Line.	Abs Time	XYZUVW	Base Dout	DAC 1/2	Ext Dout
Code	Code	Code	Channel	Accept	Reply			Position			
\$. \$	\$. \$	\$. \$	\$. \$	\$. \$	\$. \$	L.	L.	LLLLLL	\$. \$	\$. \$. \$. \$	\$. \$
0x55aa	0x0000	AbsTime PlayAllRight	1:6Shaft mold Mode	0:Host	0:Host	L.	L.	LLLLLL	XX	\$. \$. \$. \$	XX
		0x1302									

3.MBOXError responseUDPData format (error reason: internal buffer full)

UDP Data											
AppControlField				AppWhoField		AppDataField					
Confirm	Pass	Function	Object	Who	Who	Line	Abs Time	XYZUVW	Base Dout	DAC 1/2	Ext Dout
Code	Code	Code	Channel	Accept	Reply			Position			
\$. \$	\$. \$	\$. \$	\$. \$	\$. \$	\$. \$	L.	L.	LLLLLL	\$. \$	\$. \$. \$. \$	\$. \$
0x55aa	0x0000	AbsTime PlayAllErr1	1:6Shaft mold Mode	0:Host	0:Host	L.	L.	LLLLLL	XX	\$. \$. \$. \$	XX
		0x1303									

4.MBOXError responseUDPData format (error reason: insufficient data length of data frame)

UDP Data											
AppControlField				AppWhoField		AppDataField					
Confirm	Pass	Function	Object	Who	Who	Line	Abs Time	XYZUVW	Base Dout	DAC 1/2	Ext Dout
Code	Code	Code	Channel	Accept	Reply			Position			
\$. \$	\$. \$	\$. \$	\$. \$	\$. \$	\$. \$	L.	L.	LLLLLL	\$. \$	\$. \$. \$. \$	\$. \$
0x55aa	0x0000	AbsTime PlayAllErr2	1:6Shaft mold Mode	0:Host	0:Host	L.	L.	LLLLLL	XX	\$. \$. \$. \$	XX
		0x1304									

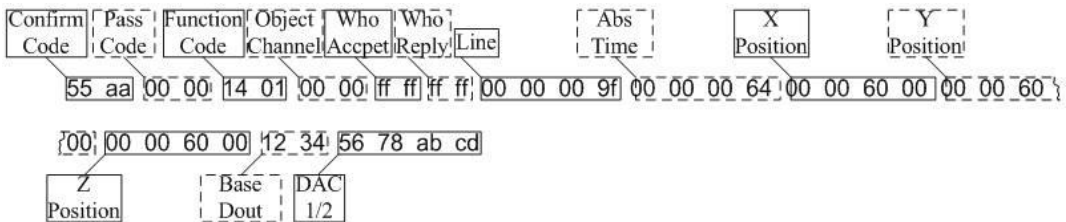
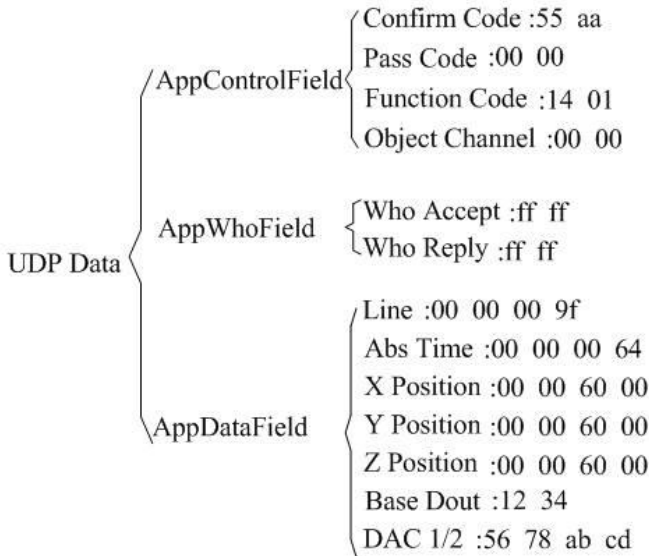
4.2.8.MBOXPlay relative time data operation (3axis platform mode)

MBOXThe function code for playing relative time format position data is:1401;3The object channel corresponding to the axis dynamic platform is0.

1.Host sendsUDPData Format

UDP Data											
AppControlField				AppWhoField		AppDataField					
Confirm	Pass	Function	Object	Who	Who	Line.	Delta	XYZ	Base	DAC	Ext
Code	Code	Code	Channel	Accept	Reply		Time	Position	Dout	1/2	Dout
\$. \$	\$. \$	\$. \$	\$. \$	\$. \$	\$. \$	L.	L.	L..LL	\$. \$	\$. \$. \$. \$	\$. \$
0x55aa	0x0000	DeltaTime	0:3Shaft mold	0:None	0:None	L.	L.	LLL	XX	\$. \$. \$. \$	XX
		PlayAll	Mode								
		0x1401		ff.ff:All	ff.ff:All						
				ff.xx:Num	ff.xx:Num						
				xx.ff:Group	xx.ff:Group						
				Mid: Me	Mid: Me						

MBOXPlay relative time data operation (3axis platform mode)UDP DataExample



2.MBOXCorrect answerUDPData Format

UDP Data											
AppControlField				AppWhoField		AppDataField					
Confirm	Pass	Function	Object	Who	Who	Line.	Delta Time	XYZ	Base Dout	DAC 1/2	Ext Dout
Code	Code	Code	Channel	Accept	Reply			Position			
\$. \$	\$. \$	\$. \$	\$. \$	\$. \$	\$. \$	L.	L.	L..LL	\$. \$	\$. \$. \$. \$	\$. \$
0x55aa	0x0000	DeltaTime PlayAll	0:3Shaft mold Mode	0:Host	0:Host	L.	L.	LLL	XX	\$. \$. \$. \$	XX
		0x1402									

3.MBOXError responseUDPData format (error reason: internal buffer full)

UDP Data											
AppControlField				AppWhoField		AppDataField					
Confirm	Pass	\$. \$	Object	Who	Who	Line	Delta Time	XYZ	Base Dout	DAC 1/2	Ext Dout
Code	Code	XX	Channel	Accept	Reply			Position			
\$. \$	\$. \$	\$. \$	\$. \$	\$. \$	\$. \$	L.	L.	L..LL	\$. \$	\$. \$. \$. \$	\$. \$
0x55aa	0x0000	DeltaTime PlayAll	0:3Shaft mold Mode	0:Host	0:Host	L.	L.	LLL	XX	\$. \$. \$. \$	XX
		0x1403									

4.MBOXError responseUDPData format (error reason: insufficient data length of data frame)

UDP Data											
AppControlField				AppWhoField		AppDataField					
Confirm	Pass	\$. \$	Object	Who	Who	Line	Delta Time	XYZ	Base Dout	DAC 1/2	Ext Dout
Code	Code	XX	Channel	Accept	Reply			Position			
\$. \$	\$. \$	\$. \$	\$. \$	\$. \$	\$. \$	L.	L.	L..LL	\$. \$	\$. \$. \$. \$	\$. \$
0x55aa	0x0000	DeltaTime PlayAll	0:3Shaft mold Mode	0:Host	0:Host	L.	L.	LLL	XX	\$. \$. \$. \$	XX
		0x1404									

Remarks: WhenDeltaTimefor0When, the internal jog time parameter is used instead. when

DeltaTimeless than0When, the internal rewind time parameter is used instead.

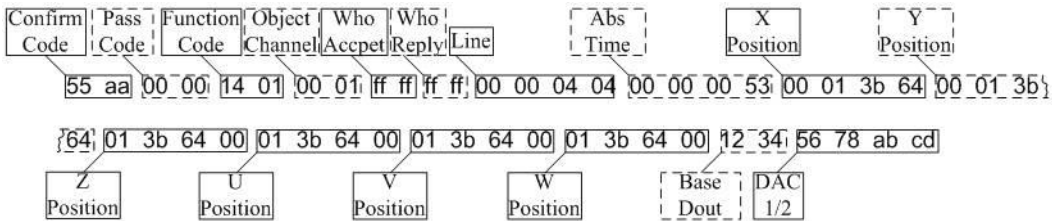
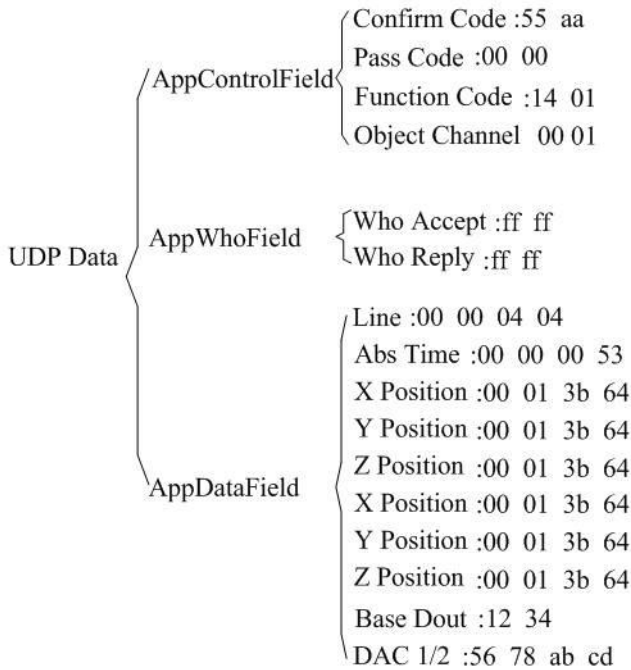
4.2.9.MBOXPlay relative time data operation (6axis platform mode)

MBOXThe function code for playing relative time format position data is:1401;6The object channel corresponding to the axis dynamic platform is1.

1.Host sendsUDPData Format

UDP Data											
AppControlField				AppWhoField		AppDataField					
Confirm	Pass	Function	Object	Who	Who	Line.	Delta	XYZUVW	Base	DAC	Ext
Code	Code	Code	Channel	Accept	Reply		Time	Position	Dout	1/2	Dout
\$. \$	\$. \$	\$. \$	\$. \$	\$. \$	\$. \$	L.	L.	LLLLLL	\$. \$	\$. \$. \$. \$	\$. \$
0x55aa	0x0000	DeltaTime	1:6Shaft mold	0:None	0:None	L.	L.	LLLLLL	XX	\$. \$. \$. \$	XX
		PlayAll	Mode								
		0x1401		ff.ff:All	ff.ff:All						
				ff.xx:Num	ff.xx:Num						
				xx.ff:Group	xx.ff:Group						
				Mid: Me	Mid: Me						

MBOXPlay relative time data operation (6axis platform mode)UDP DataExample



2.MBOXCorrect answerUDPData Format

UDP Data											
AppControlField				AppWhoField		AppDataField					
Confirm	Pass	Function	Object	Who	Who	Line.	Delta Time	XYZUVW	Base Dout	DAC 1/2	Ext Dout
Code	Code	Code	Channel	Accept	Reply			Position			
\$. \$	\$. \$	\$. \$	\$. \$	\$. \$	\$. \$	L.	L.	LLLLLL	\$. \$	\$. \$. \$. \$	\$. \$
0x55aa	0x0000	DeltaTime	1:6Shaft mold	0:Host	0:Host	L.	L.	LLLLLL	XX	\$. \$. \$. \$	XX
		PlayAll	Mode								
		0x1402									

3.MBOXError responseUDPData format (error reason: internal buffer full)

UDP Data											
AppControlField				AppWhoField		AppDataField					
Confirm	Pass	Function	Object	Who	Who	Line.	Delta Time	XYZUVW	Base Dout	DAC 1/2	Ext Dout
Code	Code	Code	Channel	Accept	Reply			Position			
\$. \$	\$. \$	\$. \$	\$. \$	\$. \$	\$. \$	L.	L.	LLLLLL	\$. \$	\$. \$. \$. \$	\$. \$
0x55aa	0x0000	DeltaTime	1:6Shaft mold	0:Host	0:Host	L.	L.	LLLLLL	XX	\$. \$. \$. \$	XX
		PlayAll	Mode								
		0x1403									

4.MBOXError responseUDPData format (error reason: insufficient data length of data frame)

UDP Data											
AppControlField				AppWhoField		AppDataField					
Confirm	Pass	Function	Object	Who	Who	Line.	Delta Time	XYZUVW	Base Dout	DAC 1/2	Ext Dout
Code	Code	Code	Channel	Accept	Reply			Position			
\$. \$	\$. \$	\$. \$	\$. \$	\$. \$	\$. \$	L.	L.	LLLLLL	\$. \$	\$. \$. \$. \$	\$. \$
0x55aa	0x0000	DeltaTime	1:6Shaft mold	0:Host	0:Host	L.	L.	LLLLLL	XX	\$. \$. \$. \$	XX
		PlayAll	Mode								
		0x1404									

4.2.10.MBOXcontrol registerCX

MBOXcontrol registerCX, used by the host computer to MBOXPerform communication control. eachCX

The register is16Bit format, currently defined functions are as follows:

Cn	serial number DEC	serial number HEX	definition	illustrate
Cn	0	0	MBOXPlayControlWord	MBOXPlay control words
Cn	1	1	MBOXDoutControlWord	MBOXDigital output control word
Cn	2	2	MBOXDac1ControlWord	MBOXAnalog output channel1control word
Cn	3	3	MBOXDac2ControlWord	MBOXAnalog output channel1control word
Cn	4	4	MBOXExtDoutControlWord	MBOXExtended digital output control word
Cn	5	5	Reserved	reserve
Cn	6	6	Reserved	reserve
Cn	7	7	Reserved	reserve

1) Cn_00:MBOXPlayback control word description

B15	B14	B13	B12	B11	B10	B9	B8	B7	B6	B5	B4	B3	B2	B1	B0
														SON	RST

B0:RST(FaultReset).	whenMBOXWhen a fault occurs, after the fault source is cleared, if this bit is set to1, then you can MBOXExit from a fault state.
B1:SON(SwitchOn)	whenSwitchOnfor0At this time, the dynamic platform can automatically find the zero position again through the communication instructions of the host computer.
B2-B15	reserve

2) Cn_01:MBOXDigital output control word

B15	B14	B13	B12	B11	B10	B9	B8	B7	B6	B5	B4	B3	B2	B1	B0
reserve				12digital output setting value											

3) Cn_02:MBOXAnalog output channel1control word

B15	B14	B13	B12	B11	B10	B9	B8	B7	B6	B5	B4	B3	B2	B1	B0
DAC1Output given value															

4) Cn_03:MBOXAnalog output channel2control word

B15	B14	B13	B12	B11	B10	B9	B8	B7	B6	B5	B4	B3	B2	B1	B0
DAC2Output given value															

5) Cn_04:MBOXExtended digital output control word

B15	B14	B13	B12	B11	B10	B9	B8	B7	B6	B5	B4	B3	B2	B1	B0
reserve				Expand12digital output setting value											

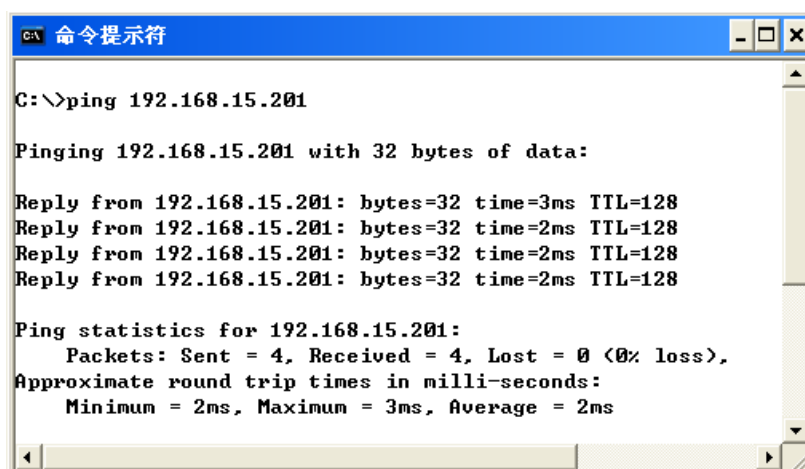
4.3MBOXEstablishing and monitoring connections to Ethernet

able to passPINGcommand (EthernetICMPagreement) to judgeMBOXWhether an Ethernet connection is established with the computer.

Additionally, you can passWiresharkSoftware to achieveMBOXPacket capture and monitoring of Ethernet operating data.

4.3.1. PINGCommand to implement Ethernet connection test

whenMBOXWhen connected to Ethernet, you can usePINGThe command tests whether the Ethernet is connected. Under normal circumstances, it is recommended to first connect the host computer toMBOXConfigure the same LAN segment. In the following example,MBOXofIPThe address is configured as:192.168.15.201

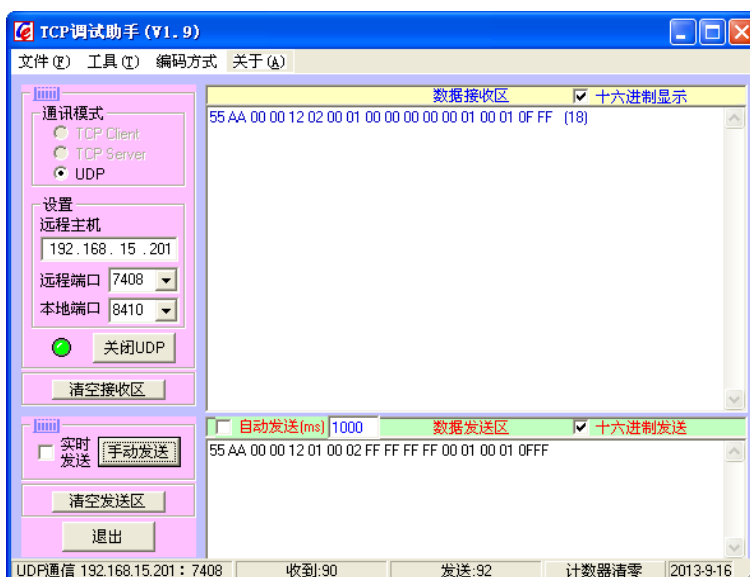


picture4-1 PINGCommand to query network connection status

abovePINGThe command test results show that the main control computer andMBOXThe connection is well established.

4.3.2.TCPDebugging assistant realizes debugging of Ethernet communication protocol

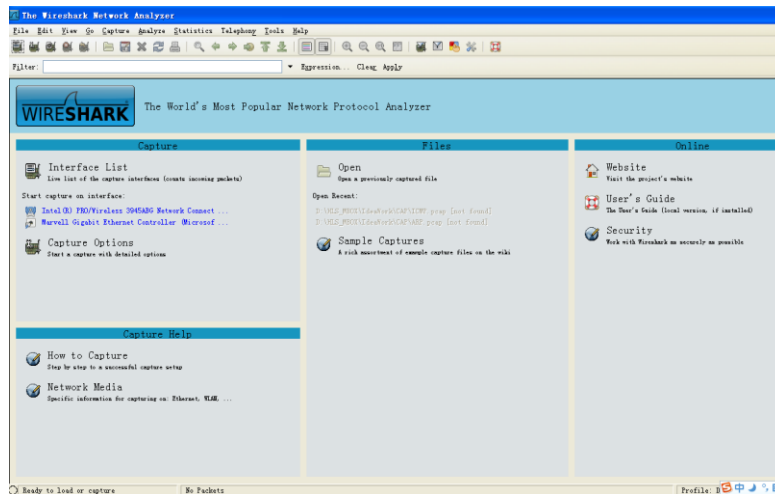
Through a person called "TCP"Debug Assistant" is a small software that can realize simple application testing and debugging of Ethernet communication protocols, providing convenience for subsequent writing of programs.



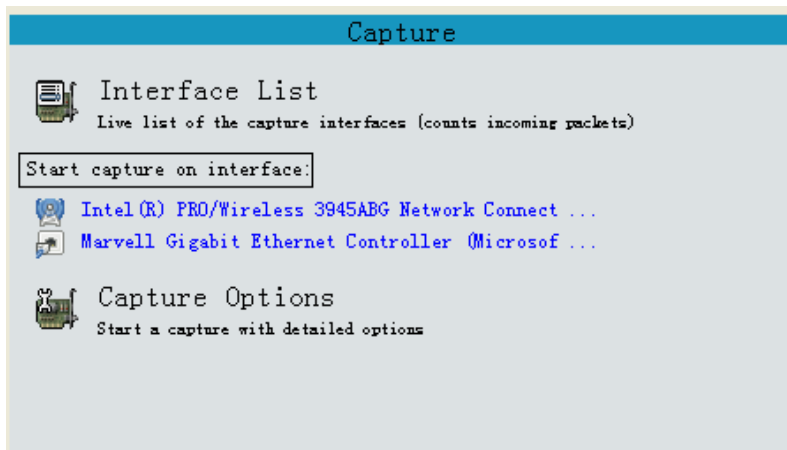
4.3.3. WireSharkRealize Ethernet communication monitoring

WireSharkThe software is an open source, free and easy-to-use Ethernet protocol operation monitoring software. Using this software, you can easily understand the communication protocol of this system, and effectively help program writing and testing of the main control computer.

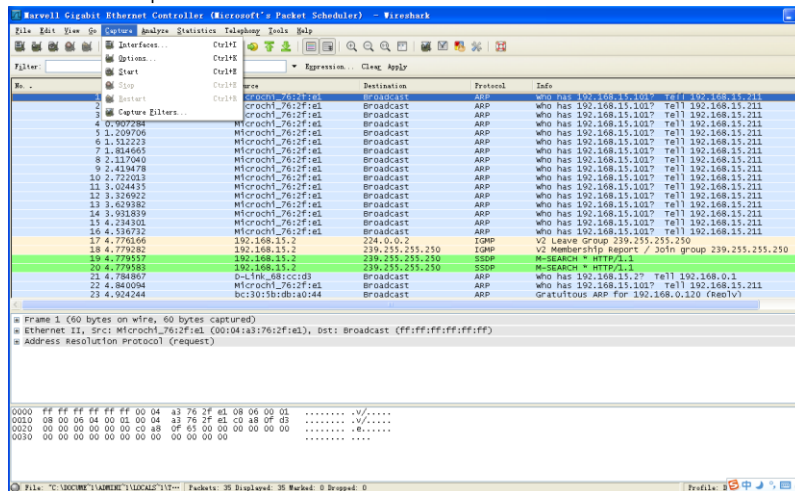
WireSharkStart interface



1, select the network card interface



2, choose CAPTURE packet capture action menu command



3,captureUDPdata pack

No.	Time	Source	Destination	Protocol	Info
1906	182.410770	Microsoft_76:2f:fe1	Broadcast	ARP	who has 192.168.15.101? Tell 192.168.15.211
1907	182.430768	192.168.15.98	255.255.255.255	UDP	Source port: 8410 Destination port: 7408
1910	182.439073	192.168.15.211	192.168.15.98	UDP	Source port: 7408 Destination port: 7408
1911	182.470032	192.168.15.98	255.255.255.255	UDP	Source port: 8410 Destination port: 7408
1912	182.472756	192.168.15.211	192.168.15.98	UDP	Source port: 7408 Destination port: 7408
1913	182.489749	192.168.15.98	255.255.255.255	UDP	Source port: 8410 Destination port: 7408
1914	182.500028	192.168.15.211	192.168.15.98	UDP	Source port: 7408 Destination port: 7408
1915	182.518158	Microsoft_76:2f:fe1	Broadcast	ARP	who has 192.168.15.101? Tell 192.168.15.211
1916	183.030138	192.168.15.98	255.255.255.255	UDP	Source port: 8410 Destination port: 7408
1917	183.038507	192.168.15.211	192.168.15.98	UDP	Source port: 7408 Destination port: 7408
1918	183.104162	192.168.15.98	255.255.255.255	UDP	Source port: 8410 Destination port: 7408
1919	183.166672	192.168.15.211	192.168.15.98	UDP	Source port: 7408 Destination port: 7408
1920	183.224548	Microsoft_76:2f:fe1	Broadcast	ARP	who has 192.168.15.101? Tell 192.168.15.211
1921	183.288621	192.168.15.98	255.255.255.255	UDP	Source port: 8410 Destination port: 7408
1922	183.290969	192.168.15.211	192.168.15.98	UDP	Source port: 7408 Destination port: 7408
1923	183.413147	192.168.15.98	255.255.255.255	UDP	Source port: 8410 Destination port: 7408
1924	183.415111	192.168.15.211	192.168.15.98	UDP	Source port: 7408 Destination port: 7408
1925	183.410798	Microsoft_76:2f:fe1	Broadcast	ARP	who has 192.168.15.101? Tell 192.168.15.211
1926	183.552881	192.168.15.98	255.255.255.255	UDP	Source port: 8410 Destination port: 7408
1927	183.552111	192.168.15.211	192.168.15.98	UDP	Source port: 7408 Destination port: 7408
1928	183.681899	192.168.15.98	255.255.255.255	UDP	Source port: 8410 Destination port: 7408
1929	183.688287	192.168.15.211	192.168.15.98	UDP	Source port: 7408 Destination port: 7408
1930	183.836923	Microsoft_76:2f:fe1	Broadcast	ARP	who has 192.168.15.101? Tell 192.168.15.211

Frame 1923 (92 bytes on wire, 92 bytes captured)
 Ethernet II, Src: Wistron_59:c4:09 (00:1d:72:59:c4:09), Dst: Broadcast (ff:ff:ff:ff:ff:ff)
 Internet Protocol, Src: 192.168.15.98 (192.168.15.98), Dst: 255.255.255.255 (255.255.255.255)
 User Datagram Protocol, Src Port: 8410 (8410), Dst Port: 7408 (7408)
 Data (50 bytes)
 Data: 55AA00013010001FFFFFFFF000000010000271000021000...
 [Length: 50]

4,UDPData packet marking and communication protocol comparison

1923 183.413147 192.168.15.98 255.255.255.255 UDP Source port: 8410 Destination port: 7408

Frame 1923 (92 bytes on wire, 92 bytes captured)
 Ethernet II, Src: Wistron_59:c4:09 (00:1d:72:59:c4:09), Dst: Broadcast (ff:ff:ff:ff:ff:ff)
 Destination: Broadcast (ff:ff:ff:ff:ff:ff)
 Source: Wistron_59:c4:09 (00:1d:72:59:c4:09)
 Type: IP (0x0800)
 Internet Protocol, Src: 192.168.15.98 (192.168.15.98), Dst: 255.255.255.255 (255.255.255.255)
 Version: 4
 Header length: 20 bytes
 Differentiated Services Field: 0x00 (DSCP 0x00: Default; ECN: 0x00)
 Total Length: 78
 Identification: 0x103e (4158)
 Flags: 0x00
 Fragment offset: 0
 Time to live: 64
 Protocol: UDP (0x11)
 Header checksum: 0x9a57 [correct]
 Source: 192.168.15.98 (192.168.15.98)
 Destination: 255.255.255.255 (255.255.255.255)
 User Datagram Protocol, Src Port: 8410 (8410), Dst Port: 7408 (7408)
 Source port: 8410 (8410)
 Destination port: 7408 (7408)
 Length: 58
 Checksum: 0xed60 [correct]
 Data (50 bytes)
 Data: 55AA00013010001FFFFFFFF000000010000271000021000...
 [Length: 50]

0000 ff ff ff ff ff ff 00 1d 72 59 c4 09 08 00 45 00 rY...E.
 0010 00 4e 10 3e 00 00 40 11 9a 57 c0 a8 0f 62 ff ff ..N>..@..W..b..
 0020 ff ff 20 da 1c f0 00 3a ed 60 55 aa 00 00 13 01 :U..
 0030 00 01 ff ff ff ff 00 00 00 01 00 00 27 10 00 024V..
 0040 10 00 00 02 10 00 00 02 10 00 00 03 10 00 00 024V..
 0050 10 00 00 02 10 00 12 34 56 78 ab cd4V..

4.4MBOXEthernet communicationMATLABroutine

Routines include:

readMBOXRegister operation reference code writing

MBOXRegister operation reference code writing

MBOXThe playback operation reference code has

detailed code explanation in the routine.

For specific codes, please contact Beijing Hollysys Motor Technology Co., Ltd. to apply.

4.5 MBOX Ethernet communication operation packet capture example

4.5.1 Reset operation of dynamic platform

4 8.120065 169.254.88.22 255.255.255.255 UDP Source port: 8410 Destination port: 7408

- Frame 4 (60 bytes on wire, 60 bytes captured)
- Ethernet II, Src: Wistron_59:c4:09 (00:1d:72:59:c4:09), Dst: Broadcast (ff:ff:ff:ff:ff:ff)
 - Destination: Broadcast (ff:ff:ff:ff:ff:ff)
 - Source: Wistron_59:c4:09 (00:1d:72:59:c4:09)
 - Type: IP (0x0800)
- Internet Protocol, Src: 169.254.88.22 (169.254.88.22), Dst: 255.255.255.255 (255.255.255.255)
 - Version: 4
 - Header length: 20 bytes
 - Differentiated Services Field: 0x00 (DSCP 0x00: Default; ECN: 0x00)
 - Total Length: 46
 - Identification: 0x84dc (34012)
 - Flags: 0x00
 - Fragment offset: 0
 - Time to live: 64
 - Protocol: UDP (0x11)
 - Header checksum: 0xf3ce [correct]
 - Source: 169.254.88.22 (169.254.88.22)
 - Destination: 255.255.255.255 (255.255.255.255)
- User Datagram Protocol, Src Port: 8410 (8410), Dst Port: 7408 (7408)
 - Source port: 8410 (8410)
 - Destination port: 7408 (7408)
 - Length: 26
 - Checksum: 0x582d [correct]
- Data (18 bytes)
 - Data: 55AA000012010000FFFFFFFF000000010000
 - Length: 18

写MBOX寄存器或生码 (FunctionCode=WriteReg)

0000	ff	ff	ff	ff	ff	ff	00	1d	72	59	c4	09	08	00	45	00	PY.....E
0010	00	2e	84	dc	00	00	40	11	f3	ce	39	fe	58	16	ff	ff
0020	ff	ff	20	da	1c	f0	00	1a	58	24	55	aa	00	00	12	01
0030	55	aa	00	00	12	01	00	00	00	00	00	00	00	00	01	00

对象通道为2表示命令寄存器 (ObjectChannel=2)

命令寄存器地址地址为0表示播放控制寄存器

命令寄存器长度为1表示只进行1个命令寄存器操作

命令寄存器数据为: 0x0000表示播放控制寄存器为0, 该设置可以实现动态平台的复位操作。

4.5.2 Emergency shutdown operation of dynamic platform

211 342.002033 169.254.88.22 255.255.255.255 UDP Source port: 8410 Destination port: 7408

- Frame 211 (60 bytes on wire, 60 bytes captured)
- Ethernet II, Src: Wistron_59:c4:09 (00:1d:72:59:c4:09), Dst: Broadcast (ff:ff:ff:ff:ff:ff)
 - Destination: Broadcast (ff:ff:ff:ff:ff:ff)
 - Source: Wistron_59:c4:09 (00:1d:72:59:c4:09)
 - Type: IP (0x0800)
- Internet Protocol, Src: 169.254.88.22 (169.254.88.22), Dst: 255.255.255.255 (255.255.255.255)
 - Version: 4
 - Header length: 20 bytes
 - Differentiated Services Field: 0x00 (DSCP 0x00: Default; ECN: 0x00)
 - Total Length: 46
 - Identification: 0x862e (34350)
 - Flags: 0x00
 - Fragment offset: 0
 - Time to live: 64
 - Protocol: UDP (0x11)
 - Header checksum: 0xf27c [correct]
 - Source: 169.254.88.22 (169.254.88.22)
 - Destination: 255.255.255.255 (255.255.255.255)
- User Datagram Protocol, Src Port: 8410 (8410), Dst Port: 7408 (7408)
 - Source port: 8410 (8410)
 - Destination port: 7408 (7408)
 - Length: 26
 - Checksum: 0x579e [correct]
- Data (18 bytes)
 - Data: 55AA000012010000FFFFFFFF009000010001
 - Length: 18

写MBOX寄存器或生码 (FunctionCode=WriteReg)

0000	ff	ff	ff	ff	ff	ff	00	1d	72	59	c4	09	08	00	45	00	PY.....E
0010	00	2e	86	2e	00	00	40	11	f2	7c	a9	fe	58	16	ff	ff
0020	ff	ff	20	da	1c	f0	00	1a	57	9e	55	aa	00	00	12	01
0030	55	aa	00	00	12	01	00	90	00	00	00	00	00	00	01	00

对象通道为0表示修改参数寄存器, 但不保存。 (ObjectChannel=0)

命令寄存器地址地址为0x0000表示: Fn 0900表示的寄存器输入控制参数进行写码

寄存器长度为1表示只进行1个参数寄存器操作

参数寄存器数据为: 0x0001这里相对于Fn 0900=1的操作, Fn 0900=1会发平台报警。

4.5.3. Emergency shutdown cancellation operation of dynamic platform

327 771.687652 169.254.88.22 255.255.255.255 UDP Source port: 8410 Destination port: 7408

- Frame 327 (60 bytes on wire, 60 bytes captured)
- Ethernet II, Src: Wlstron_59:c4:09 (00:1d:72:59:c4:09), Dst: Broadcast (ff:ff:ff:ff:ff:ff)
 - Destination: Broadcast (ff:ff:ff:ff:ff:ff)
 - Source: Wlstron_59:c4:09 (00:1d:72:59:c4:09)
 - Type: IP (0x0800)
- Internet Protocol, Src: 169.254.88.22 (169.254.88.22), Dst: 255.255.255.255 (255.255.255.255)
 - Version: 4
 - Header length: 20 bytes
 - Differentiated Services Field: 0x00 (DSCP 0x00: Default; ECN: 0x00)
 - Total Length: 46
 - Identification: 0x8717 (34583)
 - Flags: 0x00
 - Fragment offset: 0
 - Time to live: 64
 - Protocol: UDP (0x11)
 - Header checksum: 0xf193 [correct]
 - Source: 169.254.88.22 (169.254.88.22)
 - Destination: 255.255.255.255 (255.255.255.255)
- User Datagram Protocol, Src Port: 8410 (8410), Dst Port: 7408 (7408)
 - Source port: 8410 (8410)
 - Destination port: 7408 (7408)
 - Length: 26
 - Checksum: 0x579f [correct]
- Data (18 bytes)
 - Data: 55AA000012010000FFFFFFFF009000010000
 - Length: 18

写MBOX寄存器操作码 (FunctionCode=WriteReg)

0000	ff	ff	ff	ff	ff	00	1d	72	59	c4	09	08	00	45	00	rY....E.	
0010	00	2e	87	17	00	00	40	11	f1	93	a9	fe	58	16	ff	ff	0....X...
0020	ff	ff	20	da	1c	f0	00	1a	57	9f	55	aa	00	00	12	01	W...U....
0030	00	00	ff	ff	ff	ff	ff	00	90	00	01	00	00	00	00	00

对象地址为0表示紧急参数寄存器, 但不保存。 (ObjectChannel=0)

参数寄存器起始地址为0x0900表示对: Fa 0900表示的寄存器输入控制参数进行访问

寄存器长度为1表示只访问1个寄存器操作

参数寄存器数据为: 0x0000这里相对干让 Fa 0900=0的操作: Fa 0900=0 会使平台急停取消, 接着运行。

4.5.4. Special effects digital output operation of dynamic platform

9 11.253297 169.254.88.22 255.255.255.255 UDP Source port: 8410 Destination port: 7408

- Frame 9 (60 bytes on wire, 60 bytes captured)
- Ethernet II, Src: Wlstron_59:c4:09 (00:1d:72:59:c4:09), Dst: Broadcast (ff:ff:ff:ff:ff:ff)
- Internet Protocol, Src: 169.254.88.22 (169.254.88.22), Dst: 255.255.255.255 (255.255.255.255)
 - Version: 4
 - Header length: 20 bytes
 - Differentiated Services Field: 0x00 (DSCP 0x00: Default; ECN: 0x00)
 - Total Length: 46
 - Identification: 0x71fc (29180)
 - Flags: 0x00
 - Fragment offset: 0
 - Time to live: 64
 - Protocol: UDP (0x11)
 - Header checksum: 0x06af [correct]
 - Source: 169.254.88.22 (169.254.88.22)
 - Destination: 255.255.255.255 (255.255.255.255)
- User Datagram Protocol, Src Port: 8410 (8410), Dst Port: 7408 (7408)
 - Source port: 8410 (8410)
 - Destination port: 7408 (7408)
 - Length: 26
 - Checksum: 0x572d [correct]
- Data (18 bytes)
 - Data: 55AA000012010002FFFFFFFF0001000100FF
 - Length: 18

写MBOX寄存器操作码 (FunctionCode=WriteReg)

0000	ff	ff	ff	ff	ff	ff	00	1d	72	59	c4	09	08	00	45	00	rY....E.
0010	00	2e	71	fc	00	00	40	11	06	af	a9	fe	58	16	ff	ff	Q....0....X...
0020	ff	ff	20	da	1c	f0	00	1a	57	2d	55	aa	00	00	12	01	W...U....
0030	00	02	ff	ff	ff	ff	ff	00	01	00	01	00	00	00	00	00

对象地址为2表示命令寄存器 (ObjectChannel=2)

命令寄存器起始地址为1表示数字输出地址

命令寄存器长度为1表示只访问1个命令寄存器操作

命令寄存器数据为: 0x00ff表示数字输出的值为全输出1。

4.5.5. The host computer reads the digital input operation of the dynamic platform

The host computer sends a readMBOXStatus register opcode:

414 1083.953928 169.254.88.22 255.255.255.255 UDP Source port: 8410 Destination port: 7408

Frame 414 (62 bytes on wire, 62 bytes captured)

Ethernet II, Src: Wistron_59:c4:09 (00:1d:72:59:c4:09), Dst: Broadcast (ff:ff:ff:ff:ff:ff)

Destination: Broadcast (ff:ff:ff:ff:ff:ff)

Source: Wistron_59:c4:09 (00:1d:72:59:c4:09)

Type: IP (0x0800)

Internet Protocol, Src: 169.254.88.22 (169.254.88.22), Dst: 255.255.255.255 (255.255.255.255)

Version: 4

Header length: 20 bytes

Differentiated Services Field: 0x00 (DSCP 0x00: Default; ECN: 0x00)

Total Length: 48

Identification: 0x87b4 (34740)

Flags: 0x00

Fragment offset: 0

Time to live: 64

Protocol: UDP (0x11)

Header checksum: 0xf0f4 [correct]

Source: 169.254.88.22 (169.254.88.22)

Destination: 255.255.255.255 (255.255.255.255)

User Datagram Protocol, Src Port: 8410 (8410), Dst Port: 7408 (7408)

Source port: 8410 (8410)

Destination port: 7408 (7408)

Length: 28

Checksum: 0x58cc [correct]

Data (20 bytes)

Data: 55AA000011010000FFFFFFFF005E000200000000

[Length: 20]

读MBOX寄存器操作码 (FunctionCode=ReadReg)

对象通道为0表示Dn状态寄存器, (ObjectChannel=0)

状态寄存器起始地址为0x005E

寄存器长度为2表示访问2个寄存器操作

附加冗余数据, 无用。

状态寄存器地址0x005E表示MBOX的数字物理输入

状态寄存器地址0x005F表示MBOX的数字逻辑输入

MBOXOpcode to return status register:

415 1083.955692 192.168.15.201 169.254.88.22 UDP Source port: 7408 Destination port: 7408

Frame 415 (62 bytes on wire, 62 bytes captured)

Ethernet II, Src: Microchi_b2:54:51 (00:04:a3:b2:54:51), Dst: Wistron_59:c4:09 (00:1d:72:59:c4:09)

Destination: Wistron_59:c4:09 (00:1d:72:59:c4:09)

Source: Microchi_b2:54:51 (00:04:a3:b2:54:51)

Type: IP (0x0800)

Internet Protocol, Src: 192.168.15.201 (192.168.15.201), Dst: 169.254.88.22 (169.254.88.22)

Version: 4

Header length: 20 bytes

Differentiated Services Field: 0x00 (DSCP 0x00: Default; ECN: 0x00)

Total Length: 48

Identification: 0x0a00 (2560)

Flags: 0x00

Fragment offset: 0

Time to live: 64

Protocol: UDP (0x11)

Header checksum: 0x9e37 [correct]

Source: 192.168.15.201 (192.168.15.201)

Destination: 169.254.88.22 (169.254.88.22)

User Datagram Protocol, Src Port: 7408 (7408), Dst Port: 7408 (7408)

Source port: 7408 (7408)

Destination port: 7408 (7408)

Length: 28

Checksum: 0x8c41 [correct]

Data (20 bytes)

Data: 55AA00001102000000000000005E000200010001

[Length: 20]

MBOX寄存器读反馈操作码 (FunctionCode=ReadRegReply)

对象通道为0表示Dn状态寄存器, (ObjectChannel=0)

状态寄存器起始地址为0x005E

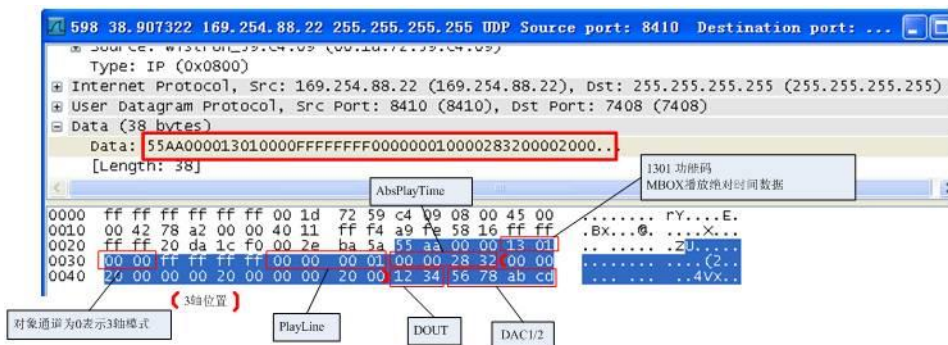
寄存器长度为2表示反馈2个寄存器操作

返回数据: Dn 05I= 0x0001 Dn 05F= 0x0001

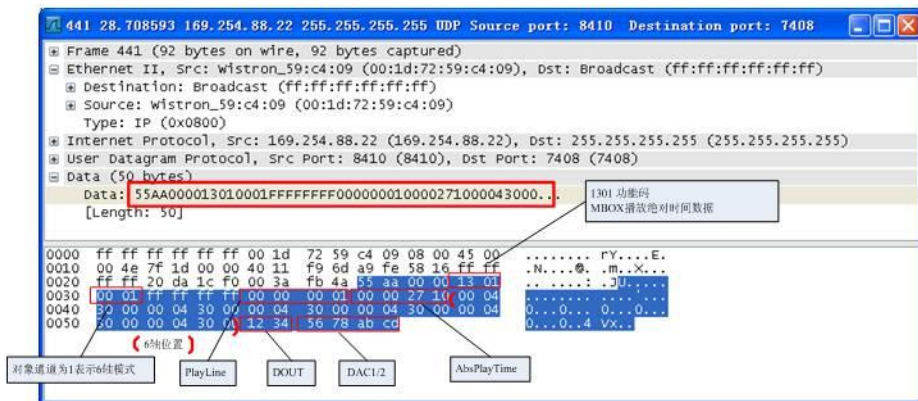
状态寄存器地址0x005E表示MBOX的数字物理输入

状态寄存器地址0x005F表示MBOX的数字逻辑输入

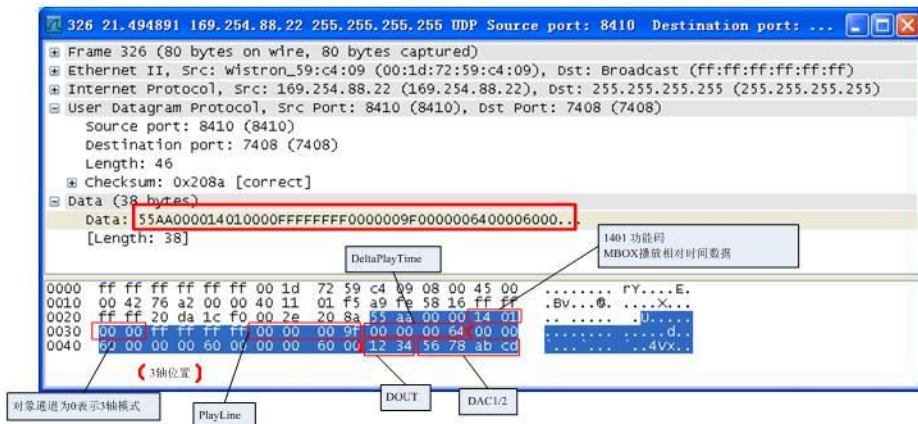
4.5.6.Dynamic platform playback absolute time data operation (3axis)



4.5.7.Dynamic platform playback absolute time data operation (6axis)



4.5.8.Dynamic platform playback relative time data operation (3axis)



Chapter 5 Operation Settings of Dynamic Platform

5.1 How to shut down the dynamic platform when it fails

MBOX When the dynamic platform controller detects a fault, it can have two shutdown methods as follows.

Parameter number	Parameter Description	Predetermined area	Set unit	Factory settings
Fn 00A	MBOX Methods to shut down after a fault is discovered: 0: Servo enable is turned off and stopped; 1: Servo maintains position and stops	0~1	-	1

Way 0 The shutdown mode can completely shut down the servo drive. When configured HS When the servo drive is configured with a dynamic brake and the relevant dynamic brake usage parameters are set, the mechanical part of the platform can be dynamically braked. Otherwise, the mechanical part of the platform is in a completely mechanically free state.

Way 1 The shutdown method can keep the mechanical parts of the platform related to the servo drive axis that are still running normally in the state when the failure occurred.

5.2 Initial positioning parameters of dynamic platform

When the dynamic platform is initially powered on, it first needs to perform initial positioning. MBOX Setting parameter package for initial positioning include:

Parameter number	Parameter Description	Predetermined area	Set unit	Factory settings
Fn 00B	Allowable error zone for initial positioning	100~10000	Pulse	500
Fn 00C	Motor initial positioning speed	10~1000	RPM	100/300
Fn 00D	Distance from motor positioning origin to overtravel point (unit: 100pulses). When the number is -1 When , it means that each axis of the dynamic platform independently sets the motor positioning origin to Super handicap distance.	- 1~10000	100Pulse	500

5.3 Playback control parameters of dynamic platform

5.3.1 MBOX digital output synchronization settings

Parameter number	Parameter Description	Predetermined area	Set unit	Factory settings
Fn 010	DOUT and PlayData Synchronous update running flag: for 1 Then from PlayData Updating DOUT data, otherwise, ignored PlayData medium data , Only from CX Updating	0~1	-	1

when MBOX When the digital output is used for the special effects of the dynamic platform body environment, Fn 010 Set as 1, in order to synchronize with the dynamic platform playback data.

MBOX The digital output can also be used independently for overall environmental effects. At this time, Fn 010 Set as 0, can be decoupled from the dynamic platform playback data, and the host computer can write MBOX register CX The operation mode can be controlled independently 12 digital output of environmental special effects.

5.3.2.MBOXAnalog output synchronization settings

Parameter number	Parameter Description	Predetermined area	Set unit	Factory settings
Fn 011	DACandPlayDataSynchronous update running flag: for1Then fromPlayData Updating DOUTdata, otherwise, ignored PlayDatadata, only fromCX Updating	0~1	-	1

whenMBOXWhen the analog output is used for the special effects of the dynamic platform body environment,Fn 010Set as1, in order to synchronize with the dynamic platform playback data.

MBOXThe analog output can also be used independently for overall environmental effects. At this time,Fn 010Set as0, can be decoupled from the dynamic platform playback data, and the host computer can writeMBOXregisterCXThe operation mode can be controlled independently2Road environment special effects simulation quantity.

5.3.3.MBOXPosition run synchronization settings

MBOXThere is a slight difference between the clock of the computer and the clock of the host computer. In order to ensure that the Ethernet playback data enters MBOXand execute it in time to ensure the synchronization of position control and playback. It can be modified byFn 012To speed up the completion of actions and avoid excessive data accumulation in the Ethernet data buffer, causing the execution of the dynamic platform to lag.

Parameter number	Parameter Description	Predetermined area	Set unit	Factory settings
Fn 012	MBOXPlayback action controls playback speed (to achieve acceleration and deceleration) less than1000:since Automatically adjust playback speed mode; greater than or equal to 1000:useFXSetting parameters.	- 1~10000	-	1200

When this parameter is1000When, it means operating at rated speed. The larger the value, the faster the playback execution speed, which may lead to a stepped feeling when the dynamic platform is running. The smaller the value, the slower the playback speed, which may cause the execution of the dynamic platform to lag. default value1200Generally, it can meet the synchronization and smoothness of platform playback actions at the same time.

whenFn 012less than1000, it means automatically adjusting the playback speed mode according to the desired lag time, as shown inMBOX Processed automatically. The relevant parameters are as follows:

Parameter number	Parameter Description	Predetermined area	Set unit	Factory settings
Fn 01D	MBOXPlayback action controls playback speed Automatically adjust delay tolerance time (unit: ms)	1~30000	ms	100
Fn 01E	MBOXPlayback speed controlKparameter	1~1000	0.01	50
Fn 01F	MBOXPlayback speed controlTparameter	0~10000	ms	50

5.3.4.MBOXjogging mode execution time setting

whenMBOXZero relative movement time is received; or new absolute time when playing dataPlayTimeIf there is no change at the time point, it is considered to be the point-to-point mode, which means that the internal parameters are directly used.Fn 013Changes the position at the specified time.

Operation settings of dynamic platform

Parameter number	Parameter Description	Predetermined area	Set unit	Factory settings
Fn 013	When the command time point does not change, directly change the power Movement time of machine position (used for jog mold (Formula) unit:ms	10~30000	ms	100

MBOXThe jog mode can easily debug the position and posture of the dynamic platform.

5.3.5.MBOXBack mode execution time setting

whenMBOXNegative relative movement time is received; or new absolute time when playing data, ifPlayTime If the time point is smaller than the previous time point, it is considered to be the backward mode, which means that the internal parameters are used directly.Fn 014Changes the position at the specified time.

Parameter number	Parameter Description	Predetermined area	Set unit	Factory settings
Fn 014	When the command time point is reversed (negative increment) time), when the movement of the motor position is directly changed Time (rewind time) unit:0.1s	1~300	0.1s	10

MBOXThe rewind mode allows you to easily control the return and replay of the dynamic platform.

5.3.6.MBOXFast forward mode judgment and execution time setting

whenMBOXWhen receiving new playback data, ifPlayDeltaTimeThe time value is greater than the set parameter value Fn 015, it is determined to be fast forward mode.

whenFn 015The value is0When , cancel the judgment of fast forward mode.

Parameter number	Parameter Description	Predetermined area	Set unit	Factory settings
Fn 015	When the instruction time point moves forward quickly, it is judged that the time point is fast Threshold value of forward command (fast forward judgment threshold) unit:0.1s	0~300	0.1s	30

Use internal parameters directly in fast forward modeFn 016Changes the position at the specified time.

Parameter number	Parameter Description	Predetermined area	Set unit	Factory settings
Fn 016	Directly changes the motor position in fast forward mode Movement time (fast forward time) unit:0.1s	1~300	0.1s	10

MBOXThe fast forward mode makes it easy to jump forward quickly on dynamic platforms.

5.3.7.MBOXEmergency stop mode execution time setting

whenMBOXThe emergency stop input switch (sensor) signal is detected orMBOXWhen the emergency stop is forced to be valid through communication, use the parameterFn017Set the execution time of emergency stop.

Parameter number	Parameter Description	Predetermined area	Set unit	Factory settings
Fn 017	Execution time when emergency stop is active, one Bit:0.1s	1~300	0.1s	10
Fn 018	Execution time when emergency stop is cancelled, one Bit:0.1s	1~300	0.1s	10

MBOXThe emergency stop mode can conveniently stop and hold the dynamic platform or automatically return to zero.

5.3.8.How Ethernet playback position data is processed

MBOXInternally, the Ethernet playback position command is first placed inFIFOBuffering. when hopeMBOX Always execute the latest playback position command whenFn 01CSet as0. When wishing to bring everything in via Ethernet MBOXWhen all playback position instructions are executed, theFn 01CSet as1.

Parameter number	Parameter Description	Predetermined area	Set unit	Factory settings
Fn 01C	UDP FIFOPosition command dataFIFOUse the allow flag.0:Do not useFIFO,Use the latest location data to ensure the latest instructions implement1: according toFIFOExecute position instructions in order to ensure the execution of all instructions;	0~1	-	1

5.4MBOXofIPAddress andUDPThe port number

MBOXofIPAddress and sending and receivingUDPThe port settings for the message are as follows:

5.4.1.MBOXofIPAddress setting

Parameter number	Parameter Description	Predetermined area	Set unit	Factory settings
Fn 020	MBOX_IPAddress settingsA	0~255	-	192
Fn 021	MBOX_IPAddress settingsB	0~255	-	168
Fn 022	MBOX_IPAddress settingsC	0~255	-	15
Fn 023	MBOX_IPAddress settingsD	0~255	-	201

5.4.2.MBOXofUDPPort settings

Parameter number	Parameter Description	Predetermined area	Set unit	Factory settings
Fn 024	MBOXsendUDPThe port number of the message	0~32767	-	7408
Fn 025	MBOXtake overUDPThe port number of the message	0~32767	-	7408

5.5 Host IP Address and UDP The port number

5.5.1. upper host IP Address setting

MBOX Can proactively report current operating information to the upper host. Report the target upper host IP The address settings are as follows:

Parameter number	Parameter Description	Predetermined area	Set unit	Factory settings
Fn 030	MBOX Report information target host IP Address settings A	0~255	-	192
Fn 031	MBOX Report information target host IP Address settings B	0~255	-	168
Fn 032	MBOX Report information target host IP Address settings C	0~255	-	15
Fn 033	MBOX Report information target host IP Address settings D	0~255	-	101

5.5.2. upper host UDP Port settings

The upper host sends and receives UDP The port settings for the message are as follows:

Parameter number	Parameter Description	Predetermined area	Set unit	Factory settings
Fn 034	Host sends/MBOX receiving host UDP Service sending port number	0~32767	-	8410
Fn 035	MBOX Host sending/receiving host UDP Service receiving port number	0~32767	-	8410

5.6 MBOX Proactive reporting information settings

MBOX The current running information can be proactively reported to the upper host. The specific reported information can be set as follows:

Parameter number	Parameter Description	Predetermined area	Set unit	Factory settings
Fn 040	MBOX Report mode. 0: reporting prohibited; 1 Proactively report regularly; 2: When a fault occurs, set timely reporting;	0~2	-	0
Fn 041	MBOX Reporting interval. Positive number: unit expand 1000, slow reporting; negative number: unit for 1, quick report.	- 30000~30000	-	3
Fn 042	MBOX Report DX initial address	0~255	-	0
Fn 043	MBOX Report DX length	0~32	-	32

5.7 MBOX Ethernet port indicator settings

MBOX Support standard 10/100M Ethernet. The Ethernet port has 2 An indicator light can be used to monitor the operating status of the Ethernet. Generally, the default value can be used.

Parameter number	Parameter Description	Predetermined area	Set unit	Factory settings
Fn 051	Ethernet indicatorAWorking mode configuration	0~15	-	2
Fn 052	Ethernet indicatorBWorking mode configuration	0~15	-	6

When used for special tests, the specific setting instructions are as follows: the status of the indicator light can be set as needed. The meaning of the setting value is as follows:

0	0000 = Off (pin is driven low)
1	0001 = On (pin is driven high)
2	0010 = Display link state; pin is driven high when linked
3	0011 = Display collision events; pin is temporarily driven high when a collision occurs
4	0100 = Display transmit events; pin is driven high while a packet is being transmitted
5	0101 = Display receive events; pin is driven high while a packet is being received
6	0110 = Display transmit and receive events; pin is driven high while a packet is either being received or transmitted
7	0111 = Display duplex state; pin is driven high when the PHY is in full duplex (PHYDPX (ESTAT<10>) is „1) and a link is present
8	1000 = Display speed state; pin is driven high when in 100 Mbps mode and a link is present
9	1001 = Display link state, transmit events; pin is driven high when a link is present and driven low while a packet is being transmitted
10	1010 = Display link state, receive events; pin is driven high when a link is present and driven low while a packet is being received
11	1011 = Display link state, transmit and receive events; pin is driven high when a link is present and driven low while a packet is being received or transmitted
12	1100 = Display link state, collision events; pin is driven high when a link is present and driven low temporarily when a collision occurs
13	1101 = Reserved
14	1110 = Display link and duplex state, transmit and receive events(1)
15	1111 = Display link and speed state, transmit and receive events(1)

5.8MBOXEthernet no playback data timeout detection

MBOXAt runtime, when a newUDPWhen playing command data, the keyboard display section will showUDPThe absolute time value or running frame value of the playback command. Nothing newUDPWhile playing data, the keyboard display section will show READY, indicating waiting for newUDPPPlay data command.

parameterFn053You can set the time window size for detecting the occurrence of new playback instructions.

Parameter number	Parameter Description	Predetermined area	Set unit	Factory settings
Fn 053	Ethernet no new playback data timeout detection parameters	50~10000	4ms	100

5.9MBOXofCANBus communication settings

MBOXpassCANBus andHSThe servo drive performs communication monitoring. When using, make sure toHSThe servo drive maintains the same baud rate.

Operation settings of dynamic platform

Parameter number	Parameter Description	Predetermined area	Set unit	Factory settings
Fn 061	MBOXcommunicating with the servoCANBus baud rate (unit:kbps)	1~1000	kbps	500

5.10MBOXof localMODBUSCommunication settings

MBOXSupport based onMODBUSCommunicationRS232(default hardware) orRS422/USBway of serial communication (COM). The parameters of communication settings are as follows:

Parameter number	Parameter Description	Predetermined area	Set unit	Factory settings
Fn 069	MODBUSCommunication baud rate	1~192	100bps	96
Fn 06A	MODBUSCommunication node address	1~255	-	1

useMODBUSCommunication can be easily carried outMBOXParameter batch setting and operating status monitoring.

5.11MBOXhistorical fault records

MBOXHistorical fault records are used to observe the latest8In the event of a failure, the user cannot modify the recorded value.

Parameter number	Parameter Description	Predetermined area	Set unit	Factory settings
Fn 070	up to date1Alarm fault code	-	-	0
Fn 071	up to date2Alarm fault code	-	-	0
Fn 072	up to date3Alarm fault code	-	-	0
Fn 073	up to date4Alarm fault code	-	-	0
Fn 074	up to date5Alarm fault code	-	-	0
Fn 075	up to date6Alarm fault code	-	-	0
Fn 076	up to date7Alarm fault code	-	-	0
Fn 077	up to date8Alarm fault code	-	-	0

[Remarks] The alarm fault code is0Indicates no fault. For specific fault code meanings and fault diagnosis, please refer to the chapter "Fault Diagnosis of Dynamic Platform" .

5.12MBOXAnalog output signal settings

MBOXof2analog output, from the host computer through EthernetUDPThe newsletter is updated and the latest data is stored inDX_ID_UdpDataEtherDAC1/2middle. When updated synchronously with playback data, the current data processed by the digital output buffer isDX_ID_UdpDataFifoDAC1/2.

DNIDname	DNIDserial number
DX_ID_UdpDataEtherDAC1	96
DX_ID_UdpDataEtherDAC2	97
DX_ID_UdpDataFifoDAC1	98
DX_ID_UdpDataFifoDAC2	99

MBOXcontain2isolated analog outputs that can be used for internal statusDXobservation. Users can set two channels through configuration parametersDACThe signal source and amplitude of the channel. two waysDACThe maximum output range is0~ +10V.

The analog output provides parameterizable output mode and channel selection, etc., which is convenient for users to debug and use.

5.13 Analog output signal range setting

Parameter number	Parameter Description	Predetermined area	Set unit	Factory settings
Fn 078	In normal modeDac1Maximum value setting/manual in test modeDACcommand value	1~32767	-	10000
Fn 079	In normal modeDac2Maximum value setting/manual in test modeDACcommand value	1~32767	-	10000

5.14 Channel settings for analog output signals

Parameter number	Parameter Description	Predetermined area	Set unit	Factory settings
Fn 07A	DAC1Signal source selection. -1:Sawtooth wave test mode;0-255:DXstate;256: Manual output mode	- 1~256	-	96
Fn 07B	DAC2Signal source selection. -1:Sawtooth wave test mode;0-255:DXstate;256: Manual output mode	- 1~256	-	97

【Remark】 Fn 07A/ Fn 07B=-1hour,DACChannel output sawtooth wave forDACSelf-test of output channels

Measurement.

5.15 Zero point setting of analog output signal

Parameter number	Parameter Description	Predetermined area	Set unit	Factory settings
Fn 07C	DAC1zero point	- 1000~1000	-	0
Fn 07D	DAC2zero point	- 1000~1000	-	0

5.16 Analog output signal bits and settings

Parameter number	Parameter Description	Predetermined area	Set unit	Factory settings
Fn 07E	DAC1Bits and parameters; used for development and testing. superior Automatically changes to default value after power-on. for status value bit observation	- 32768~ 32767	-	0xffff
Fn 07F	DAC2Bits and parameters; used for development and testing. superior Automatically changes to default value after power-on. for status value bit observation	- 32768~ 32767	-	0xffff

5.17 MBOX Digital output signal settings

MBOXcontain12Isolated digital output with maximum driving capability50mA/30V. The digital output provides parameterizable output mode and channel selection, etc., which is convenient for users to debug and use.

5.17.1 Digital output control mode selection

Parameter number	Parameter Description	Predetermined area	Set unit	Factory settings
Fn 080	Digital output mode. -1:Operating mode;0:Full output logic0test mode;1:Full output logic1test mode;2: Flip output logic test mode;	- 1~2	-	- 1

Operation settings of dynamic platform

【Remark】 MBOXThe digital output mode will be automatically set to the working mode after power-on. When set to 0, 1 and 2 It is generally only used for temporary debugging after power-on.

5.17.2 Digital output control channel selection

MBOXof 12 digital output from the host computer through EthernetUDP. The newsletter is updated and the latest data is stored in UdpDout middle. When updated synchronously with playback data, the current data processed by the digital output buffer is UdpFifoDout.

Parameter number	Parameter Description	Predetermined area	Set unit	Factory settings
Fn 08x	DOx Digital output selection. 1: Forced output; 0: Forced close; -1~-16: UdpDout Corresponding bit signal; -17~-32: UdpFifoDout Corresponding bit signal	- 32~-1	-	- 1

【Remark】 x=1,2,3,4,5,6,7,8,9,A,B,C Respectively DO1, DO2,,,, DO12.

5.17.3 Selection of digital output control logic

when MBOX When the external digital output requires negative logic, you can use Fn 08D to set directly without having to change the logic value of the digital output from the host computer.

Parameter number	Parameter Description	Predetermined area	Set unit	Factory settings
Fn 08D	Output XOR negation control bit. Use yours 0, 1 to set. 1 Represents negation.	0~4095	-	0

bit settings and DO The relationship between channels is as follows:

B11	B10	B9	B8	B7	B6	B5	B4	B3	B2	B1	B0
DO12	DO11	DO10	DO9	DO8	DO7	DO6	DO5	DO4	DO3	DO2	DO1

Example: when hope DO1 and DO4 When the output of is negative logic, then Fn 08D The set value is 9

Bit	B11	B10	B9	B8	B7	B6	B5	B4	B3	B2	B1	B0
DO	DO12	DO11	DO10	DO9	DO8	DO7	DO6	DO5	DO4	DO3	DO2	DO1
binary	0	0	0	0	0	0	0	0	1	0	0	1
decimal	9											

5.17.4 Selection of initial value and safety value of digital output

MBOX Digital output value. When the system is powered on and data communication with the host computer has not yet been established and you want to output a specific initial value, you can use the parameters Fn 08E to set.

Parameter number	Parameter Description	Predetermined area	Set unit	Factory settings
Fn 08E	Digital output initial value (for initial power-up conditions digital safety output)	- 32768~32767	-	0

MBOX Digital output value, when the system fails and you want to output a specific safe value, available parameters Fn 08F to set.

Parameter number	Parameter Description	Predetermined area	Set unit	Factory settings
Fn 08F	Digital output safety value (for faults etc. case digital safety output)	- 32768~32767	-	0

5.18 MBOX Setting and processing of digital input signals

MBOX contains 8 An isolated digital input. When the input optocoupler is turned on, the original value of the digital input corresponds to 1, otherwise 0. The original value of the digital input is available Dn_05E. Come observe.

DIN	DIN8	DIN7	DIN6	DIN5	DIN4	DIN3	DIN2	DIN1
Bit	B7	B6	B5	B4	B3	B2	B1	B0
Dn_05E	When the input optocoupler is turned on, the original value of the digital input corresponds to 1, otherwise 0							

5.19 Digital input signal logic inversion setting

When you want the input signal to be negative logic, you can pass the parameter Fn_09D. Implement inversion processing to obtain the logical value of the digital input.

Parameter number	Parameter Description	Predetermined area	Set unit	Factory settings
Fn_09D	Input XOR negation control bit input. Come on everyone of 0, 1 to set. 1 Represents negation.	0~255	-	0

The original value of the digital input is available Dn_05E. To observe, the logical value of the digital input is available Dn_05F. Come observe. $Dn_05F = Dn_05E \text{ xor } Fn_09D$ when $Fn_09D=0$, $Dn_05F = Dn_05E$

5.20 Setting and processing of digital input signal emergency stop signal

Parameter number	Parameter Description	Predetermined area	Set unit	Factory settings
Fn_090	Emergency stop input control. 0: Forced to close; 1: Forced enable; -1~-8: Depend on 8 digital input to determine enable;	- 8~1	-	0

[Remark] MBOX During the initial positioning process after power-on, if Fn_090 for 1, it will be automatically cleared to 0. Fn_090=0, indicating that the forced emergency stop signal is invalid, Fn_090=1, indicating that the forced emergency stop signal is valid. Fn_090= -n (n=1 ~ 8) Indicates that there is a digital input port to judge the emergency stop signal.

when MBOX Emergency stop detected (QuickStop) When the signal is valid, the dynamic platform will stop quickly. The parking method is determined by the parameters. Fn_091 To choose, as follows:

Parameter number	Parameter Description	Predetermined area	Set unit	Factory settings
Fn_091	Ways to stop quickly. 0: Return to initial positioning origin; 1: Keep current position; 2: Keep XY, Z, Current average position; -n: Horizontal n No. axis position (N=1, 2, 3)	- 3~2	-	1

when MBOX The emergency stop input switch (sensor) signal is detected or MBOX When the emergency stop is forced to be valid through communication, use the parameter Fn_017 Set the execution time of emergency stop using parameters Fn_018 Set the execution time of emergency stop cancellation.

Parameter number	Parameter Description	Predetermined area	Set unit	Factory settings
Fn_017	Execution time when emergency stop is active. one Bit: 0.1s	1~300	0.1s	10
Fn_018	Execution time when emergency stop is cancelled. one Bit: 0.1s	1~300	0.1s	10

MBOX The emergency stop mode can conveniently stop and hold the dynamic platform or automatically return to zero.

5.21 MBOX Expanded digital output signal settings

MBOX-V2Support additional extensions12Isolated digital output with maximum driving capability50mA/30V. The digital output provides parameterizable output mode and channel selection, etc., which is convenient for users to debug and use.

5.21.1 Expanded selection of digital output control modes

Parameter number	Parameter Description	Predetermined area	Set unit	Factory settings
Fn 0A0	Digital output mode. -1:Operating mode;0:Full output logic0test mode;1:Full output logic1test mode;2: Flip output logic test mode;	- 1~2	-	- 1

【Remark】 MBOXAfter power-on, the digital extended output mode will be automatically set to the working mode. When set to0,1 and2 It is generally only used for temporary debugging after power-on.

5.21.2 Digital output control channel selection

MBOXof12Expanded digital output from the host computer through EthernetUDPThe newsletter is updated and the latest data is stored inUdpExtDoutmiddle. When updated synchronously with playback data, the current data processed by the digital output buffer isUdpExtFifoDout.

Parameter number	Parameter Description	Predetermined area	Set unit	Factory settings
0Ax	ExtDOxExpanded digital output options.1: Forced output;0: Forced close;-1~-16:UdpExtDout Corresponding bit signal;-17~-32:UdpExtFifoDout Corresponding bit signal;	- 32~1	-	- 1

【Remark】 x=1,2,3,4,5,6,7,8,9,A,B,CRespectivelyExtDO1, ExtDO2, ...,ExtDO12

5.21.3 Expanded digital output control logic options

whenMBOXWhen the external extended digital output requires negative logic, you can useFn 0ADTo set directly, there is no need to change the logic value of the extended digital output from the host computer.

Parameter number	Parameter Description	Predetermined area	Set unit	Factory settings
Fn 0AD	Output XOR negation control bit. Use yours0,1 to set.1Represents negation.	0~4095	-	0

bit settings andExtDOThe relationship between channels is as follows:

B11	B10	B9	B8	B7	B6	B5	B4	B3	B2	B1	B0
DO12	DO11	DO10	DO9	DO8	DO7	DO6	DO5	DO4	DO3	DO2	DO1

Example: when hopeExtDO1andExtDO4When the output of is negative logic, thenFn 0ADThe set value is9.

Bit	B11	B10	B9	B8	B7	B6	B5	B4	B3	B2	B1	B0
DO	DO12	DO11	DO10	DO9	DO8	DO7	DO6	DO5	DO4	DO3	DO2	DO1
binary	0	0	0	0	0	0	0	0	1	0	0	1
decimal	9											

5.21.4 Expanded digital output initial value and safety value selection

MBOXExtended digital output value. When the system is powered on and data communication with the host computer has not yet been established and you want to output a specific initial value, you can use the parameters0AEto set.

Parameter number	Parameter Description	Predetermined area	Set unit	Factory settings
0AE	Extended digital output initial value (for initial power-on conditions digital safety output)	- 32768~32767	-	0

MBOXExtended digital output value, when the system fails and you want to output a specific safe value, available parametersFn 0Afto set.

Parameter number	Parameter Description	Predetermined area	Set unit	Factory settings
Fn 0AF	Extended digital output safety value (used in the event of an accident Digital safety output in case of failure, etc.)	- 32768~32767	-	0

5.22The electric cylinder body and its movement relationship with the servo motor

5.22.1Electric cylinder body parameters and stroke limits

Parameter number	Parameter Description	Predetermined area	Set unit	Factory settings
Fn 0C0	Effective stroke of electric cylinder (unit:0.1mm). when This parameter is0, it means that the electric cylinder will not be Maximum travel limit or protection.	0~30000	0.1mm	0

5.22.2Movement relationship between electric cylinder and servo motor

Parameter number	Parameter Description	Predetermined area	Set unit	Factory settings
Fn 0C1	Every time the electric cylinder moves1mmnumber of pulses. This parameter is the same asFn_0C0Parameters are combined to calculateMBOX Maximum allowed position value.	1~30000	Pulse	2000
Fn 0C2	Electric cylinder per revolution1The distance of the circle (unit: 0.1mm)(used to calculate the initial positioning required time)	1~1000	0.1mm	50

5.22.3 Electric cylinder initial positioning torque limit

When the electric cylinder has an infinite position sensor and uses the stall method to detect the zero point, the parameterFn 0C7Set the torque value for motor stall.

Parameter number	Parameter Description	Predetermined area	Set unit	Factory settings
Fn 0C7	Electric cylinder initial positioning torque limit percentage	1~300	-	50

5.23Accumulated running time limit of dynamic platform

The cumulative running time parameters of the platform are given byMBOXSystem internal settings cannot be modified by users under normal circumstances. Mainly used for recording and time limits.

5.23.1The cumulative running time of the dynamic platform

Parameter number	Parameter Description	Predetermined area	Set unit	Factory settings
Fn 0C8	Cumulative running time of the platform: days	0~30000	sky	0
Fn 0C9	Cumulative running time of the platform: hours	0~24	Hour	0
f 0CA	Cumulative running time of the platform: minutes	0~60	minute	0
Fn 0CB	Cumulative platform running time: seconds	0~60	Second	0

Operation settings of dynamic platform

5.23.2 Accumulated running time limit of dynamic platform

Parameter number	Parameter Description	Predetermined area	Set unit	Factory settings
Fn 0CF	Maximum number of days for continuous operation0: No limit n:nDay limit; will occur when time is upE_toutAlarm and shut down.	0~30000	sky	0

5.24 MBOX Analog input signal settings

Parameter number	Parameter Description	Predetermined area	Set unit	Factory settings
Fn 0FF	Analog position value low-pass filter processing time interval (unit:ms)	0~10000	ms	30
Fn 100	Sampling time interval of analog position value (single Bit:ms)	10~10000	ms	20
Fn 101	Analog input location1aisleADCZero drift	0~256	-	0
Fn 102	Analog input location2aisleADCZero drift	0~256	-	0
Fn 103	Analog input location3aisleADCZero drift	0~256	-	0
Fn 104	Analog input location4aisleADCZero drift	0~256	-	0
Fn 105	Analog input location5aisleADCZero drift	0~256	-	0
Fn 106	Analog input location6aisleADCZero drift	0~256	-	0
Fn 107	Analog input1Channel corresponds to motor pulse number	1~30000	100Pulse/v	200
Fn 108	Analog input2Channel corresponds to motor pulse number	1~30000	100Pulse/v	200
Fn 109	Analog input3Channel corresponds to motor pulse number	1~30000	100Pulse/v	200
Fn 10A	Analog input4Channel corresponds to motor pulse number	1~30000	100Pulse/v	200
Fn 10B	Analog input5Channel corresponds to motor pulse number	1~30000	100Pulse/v	200
Fn 10C	Analog input6Channel corresponds to motor pulse number	1~30000	100Pulse/v	200

5.25 MBOX Dynamic platform system software version number

MOXThe software version number of the dynamic platform system is in the parameterFn_1FFreflected in.

Parameter number	Parameter Description	Predetermined area	Set unit	Factory settings
Fn 01FF	System software version number	-	-	-

Chapter 6 Operation Monitoring and Diagnosis of Dynamic Platform

6.1 Dynamic platform running status list

6.1.1 HSServo drive operating status

X,Y,ZThe operating status of the three servo drives is as follows:

serial numberDEC	Dn	serial numberHEX	Definition
0	Dn	0	xAxis servo speed
1	Dn	1	yAxis servo speed
2	Dn	2	zAxis servo speed
3	Dn	3	xAxis servo load rate
4	Dn	4	yAxis servo load rate
5	Dn	5	zAxis servo load rate
6	Dn	6	xAxis motor absolute position (unit: encoder pulse)
7	Dn	7	
8	Dn	8	yAxis motor absolute position (unit: encoder pulse)
9	Dn	9	
10	Dn	A	zAxis motor absolute position (unit: encoder pulse)
11	Dn	B	
12	Dn	C	xAxis motor absolute position command (unit: encoder pulse)
13	Dn	D	
14	Dn	E	yAxis motor absolute position command (unit: encoder pulse)
15	Dn	F	
16	Dn	10	zAxis motor absolute position command (unit: encoder pulse)
17	Dn	11	
18	Dn	12	xAxis servo general status word
19	Dn	13	yAxis servo general status word
20	Dn	14	zAxis servo general status word
twenty one	Dn	15	xAxis servo application status word
twenty two	Dn	16	yAxis servo application status word
twenty three	Dn	17	zAxis servo application status word
twenty four	Dn	18	xAxis servo fault code
25	Dn	19	yAxis servo fault code
26	Dn	1A	zAxis servo fault code

U,V,WThe operating status of the three servo drives is as follows:

serial numberDEC	Dn	serial numberHEX	Definition
27	Dn	1B	UAxis servo speed
28	Dn	1C	VAxis servo speed
29	Dn	1D	WAxis servo speed
30	Dn	1E	UAxis servo load rate
31	Dn	1F	VAxis servo load rate
32	Dn	20	WAxis servo load rate
33	Dn	twenty one	UAxis motor absolute position (unit: encoder pulse)
34	Dn	twenty two	
35	Dn	twenty three	VAxis motor absolute position (unit: encoder pulse)
36	Dn	twenty four	
37	Dn	25	WAxis motor absolute position (unit: encoder pulse)
38	Dn	26	
39	Dn	27	UAxis motor absolute position command (unit: encoder pulse)
40	Dn	28	
41	Dn	29	VAxis motor absolute position command (unit: encoder pulse)
42	Dn	2A	
43	Dn	2B	WAxis motor absolute position command (unit: encoder pulse)
44	Dn	2C	
45	Dn	2D	UAxis servo general status word
46	Dn	2E	VAxis servo general status word
47	Dn	2F	WAxis servo general status word
48	Dn	30	UAxis servo application status word
49	Dn	31	VAxis servo application status word
50	Dn	32	WAxis servo application status word
51	Dn	33	UAxis servo fault code
52	Dn	34	VAxis servo fault code
53	Dn	35	WAxis servo fault code

6.1.2 MBOXRunning fault code status

serial numberDEC	Dn	serial numberHEX	Definition
56	Dn	38	Currently scanning system fault code
57	Dn	39	Upload the scanned system fault code
58	Dn	3A	MBOXWarning fault code
59	Dn	3B	MBOXSerious fault code

6.1.3 MBOXOperation control word and status word

serial numberDEC	Dn	serial numberHEX	Definition
62	Dn	3E	MBOXOverall system statusID
63	Dn	3F	MBOXinitial positioning processID
64	Dn	40	MBOXapplication control words
65	Dn	41	MBOXapplication status words
66	Dn	42	MBOXAuxiliary status word

6.1.4 MBOXPlayback operation speed

serial numberDEC	Dn	serial numberHEX	Definition
68	Dn	44	UDPThe time difference between the beginning and the end of the buffer data
69	Dn	45	(Actual) playback speed adjustment factor (base value:1000). as0when, it means UDPThe data hasn't come yet.

6.1.5 MBOXEthernet data status

serial numberDEC	Dn	serial numberHEX	Definition
72	Dn	48	UDPBuffer write pointer
73	Dn	49	UDPbuffer read pointer
74	Dn	4A	UDPData depth observation when the buffer receives new data
75	Dn	4B	UDPBuffer current data depth observation

6.1.6 MBOXEthernet port status

serial numberDEC	Dn	serial numberHEX	Definition
82	Dn	52	MBOXEthernet status
83	Dn	53	MBOXofMACaddress
84	Dn	54	
85	Dn	55	

6.1.7 MBOXanalog inputADCCConversion result status

serial numberDEC	Dn	serial numberHEX	Definition
86	Dn	56	ADCIN1Conversion result
87	Dn	57	ADCIN2Conversion result
88	Dn	58	ADCIN3Conversion result
89	Dn	59	ADCIN4Conversion result
90	Dn	5A	ADCIN5Conversion result
91	Dn	5B	ADCIN6Conversion result

6.1.8 MBOXdigital input status

serial numberDEC	Dn	serial numberHEX	Definition
94	Dn	5E	MBOXDigital input physical value (optocoupler conduction is1)
95	Dn	5F	MBOXDigital input logical value (physical valueXORnegate the value)

6.1.9 MBOXofDACData status

serial numberDEC	Dn	serial numberHEX	Definition
96	Dn	60	NewestDAC1Ethernet data
97	Dn	61	NewestDAC2Ethernet data
98	Dn	62	DACThe current data of the buffer area read head. only ifMBOXEnter OperationEnabledvalid.
99	Dn	63	DACThe current data of the buffer area read head. only ifMBOXEnter OperationEnabledvalid.

6.1.10 MBOXThe digital output data status of

serial numberDEC	Dn	serial numberHEX	Definition
100	Dn	64	DOUTLatest Ethernet data updates
101	Dn	65	DOUTThe current data of the buffer area read head. only ifMBOXEnter OperationEnabledvalid.
102	Dn	66	MBOXDigital output logic value
103	Dn	67	MBOXOutput physical value

6.1.11 MBOXofUDPInput position command monitoring

serial numberDEC	Dn	serial numberHEX	Definition
106	Dn	6A	UDP XAxis position command
107	Dn	6B	
108	Dn	6C	UDP YAxis position command
109	Dn	6D	
110	Dn	6E	UDP ZAxis position command
111	Dn	6F	
112	Dn	70	UDP UAxis position command
113	Dn	71	
114	Dn	72	UDP VAxis position command
115	Dn	73	
116	Dn	74	UDP WAxis position command
117	Dn	75	

6.1.12The cumulative running time of the dynamic platform

Parameter number	Parameter Description	Predetermined area	Set unit	Factory settings
Fn 0C8	Cumulative running time of the platform: days	0~30000	sky	0
Fn 0C9	Cumulative running time of the platform: hours	0~24	Hour	0
f 0CA	Cumulative running time of the platform: minutes	0~60	minute	0
Fn 0CB	Cumulative platform running time: seconds	0~60	Second	0

6.1.13The cumulative load rate weighted effective running time of the dynamic platform

For each servo drive of the dynamic platform, MBOXThe effective running time weighted by load factor can be accumulated, and the effective running time can be used for reliability management such as service life evaluation of servo motors or electric cylinders.

Parameter number	Parameter Description	Predetermined area	Set unit	Factory settings
Fn 0D0	xAxis motor/electric cylinder load factor weighted effective operating time	-	Second	0
Fn 0D1				0
Fn 0D2	yAxis motor/electric cylinder load factor weighted effective operating time	-	Second	0
Fn 0D3				0
Fn 0D4	zAxis motor/electric cylinder load factor weighted effective operating time	-	Second	0
Fn 0D5				0
Fn 0D6	uAxis motor/electric cylinder load factor weighted effective operating time	-	Second	0
Fn 0D7				0
Fn 0D8	vAxis motor/electric cylinder load factor weighted effective operating time	-	Second	0
Fn 0D9				0
Fn 0DA	wAxis motor/electric cylinder load factor weighted effective operating time	-	Second	0
Fn 0DB				0

Remark:32Bit accumulation time variable: low16in front, high16Behind. like:Fn 0D0means low16Bit, Fn 0D1means high16Bit.

6.2Local operation monitoring based on keyboard display

via keyboardFnxxxas well asDnxxxandEn xxxOKMBOXPerform parameter setting set status and fault monitoring according to the operating status.

6.3based onMODBUSlocal operation monitoring

MBOXofRS232port, supportMODBUSThe communication method allows for convenient local operation monitoring of the dynamic platform. Users can write their own host computer or touch screen monitoring program.

Beijing Hollysys Motor Technology Co., Ltd. provides local monitoring solutions based on touch screens. Please contact us if you need it.

6.4Remote operation monitoring based on Ethernet

MBOXThe Ethernet communication protocol supports all parameters and status access, and users can write their own remote monitoring programs for the host computer.

In order to facilitate users to become familiar with the use of this system, our company provides a free debugging and testing interface software for the dynamic platform MBOXPlay, please contact Beijing Hollysys Motor Company if needed.

6.5 Fault codes and diagnosis of dynamic platform

via keyboard, local MODBUS Monitoring or remote Ethernet monitoring program allows users to conveniently monitor and diagnose the operating faults of the dynamic platform. Common fault codes and their detailed descriptions are as follows.

error code	ledshow	Fault description
1401	E_dnRE	Motor drive no response error alarm.
1500	EB	EncoderABsignal alarm
1510	uE	EncoderUVWsignal alarm
1600	E_FrAE	FRAMData write operation verification error.
1700	E GEAr	Abnormal electronic gear parameters
2200	E LUd	Under voltage alarm
2500	E oc-A	APhase overcurrent alarm
2501	Eoc-b	BPhase overcurrent alarm
2502	E oc-C	CPhase overcurrent alarm
2510	oeLod	Overload alarm
2520	ESPE	Maximum speed limit exceeded
2530	oeLh	Overvoltage alarm
2600	AHr	FRAMParameter overflow error.
2610	E PEOU	Position deviation counter overflow
2620	E PHAS	Phase loss alarm
2630	E PHot	Power device temperature is too high
2631	E	Power device failure alarm
2640	EF	Power failure
2645	E PosE	Position out of tolerance alarm
2650	E PU	FRAMRead and write timeout
2660	E PS1E	1Phase currentADCZero point abnormality alarm
2661	E PS2E	2Phase currentADCZero point abnormality alarm
2900	E SPEE	Stall alarm
3000	E T	Temperature sensor disconnection alarm
3100	E Ubrt	Motor vibration alarm
3110	E USPn	The motor model code is not supported
3600	E 2LoS	EncoderZPulse loss error alarm
3601	E 2EtE	EncoderZToo many pulses error alarm
NONE	ConErr	Abnormal information display on the keyboard and alarm

appendix:HSCustom matching of servo parameters

A.1.HSOverview of parameter adjustment of servo drive

HSThe standard factory default parameters of the servo drive are drive system parameters that are suitable for most situations and are controlled using the traditional pulse plus direction method.HSThe default parameters of the servo drive can be set by changingFn_007Set as1, power on again to restore the default parameters.

whenHSServo drive cooperationMBOXUsed in networked servo control applications of dynamic platforms,HSThe servo drive needs to be adjusted from standard parameters to customized control parameters. For parameter adjustment methods, please refer to "HSSeries full digital AC servo drive instruction manual》

HSTo adjust the core parameters of the servo drive, you first need toFn_008The system password is set to the technical support password or development support password.

A.2.HSParameter adjustment of servo drive (required option)

HSWhen the servo standard driver is used in a dynamic platform system, the parameters that must be adjusted include:

A.2.1.Control mode parameters

need toFn_000Set as3,useCANImplementation of bus communication modeHSservo withMBOXcommunication control.

Parameter number	Parameter Description	Predetermined area	Set unit	Custom matching
Fn 000	Application working mode: 0:KeyboardMode: Internal debugging test mode; 1: ControlPanelMode:Usual control port hard-wired working mode;2:ModbusControlMode;3: CanRegVisitMode	0~3	-	3

A.2.2.Overtravel parameters

MBOXfrom31012After the version, the dynamic platform supports completely unlimited initial positioning and operation of the sensor. Under normal circumstances, the overtravel detection function can be set to0, indicating no overtravel (forward rotation prohibited/reverse rotation prohibited)

However, when the user chooses to connect an external limit sensor to the electric cylinder of the dynamic platform, the overtravel parameter needs to be turned on. First, you need to ensure that the overtravel detection function is in detection status and confirm the configuration.Fn_02Ffor1. as follows:

Parameter number	Parameter Description	Predetermined area	Set unit	Custom matching
Fn 02F	Forward and reverse limit detection function:0: No overtravel (forward rotation) inhibit/reverse inhibit) detection;1: Perform over-travel detection	0~1	-	1

HSCustom matching of servo parameters

The hardware connection ensures that the limit sensors for forward rotation prohibition and reverse rotation prohibition are connected to the corresponding connection port of the servo controller. Check whether its input configuration is correct, as follows:

Parameter number	Parameter Description	Predetermined area	Set unit	Custom matching
Fn 01E	Forward rotation prohibited (CCWL)set up 1: Internal enable;0: internally closed;-1~-8:By the digital input signal port (SignalIn 1~8)Sure	- 8~+1	-	0
Fn 01F	Inversion prohibited (CWL)set up 1: Internal enable;0: internally closed;-1~-8:By the digital input signal port (SignalIn 1~8)Sure	- 8~+1	-	recommend:-7 See description

When the overtravel detection function is enabled and the input signals of forward rotation prohibition and reverse rotation prohibition enter the servo drive from the digital input port, in order to ensure that the overtravel detection sensor of forward rotation prohibition or reverse rotation prohibition is disconnected will also function. For safety protection, generally the forward rotation prohibition and reverse rotation prohibition signals adopt a negative logic effective mode (that is, the effective mode is logically opposite to the digital port input mode such as enable). Generally, the output form of active limit switch is normally closed in normal state and open in limit state (Break-Contact), consistent with the use of negative logic.

In addition, in some cases, passive limit switches are used, which are normally open in the normal state and normally closed in the limit state. Then you need to modify the input signal logic of forward rotation prohibition and reverse rotation prohibition, and you can set the inversion through the digital input channel of the overtravel limit signal. That is: you can modify the configuration parameters "Fn 00E"and"Fn 00F"value to change the logic of the input signal, as shown in the following table:

Parameter number	Parameter Description	Parameter range	Custom matching
Fn 00E	Digital input XOR negation control bit1(Input signal portSignalIn 1~4) Thousands:SignalIn 4Input; hundreds digit:SignalIn 3Input; tens digit:SignalIn 2Input; units digit:SignalIn 1enter	0000~1111	0000
Fn 00F	Digital input XOR negation control bit2(Input signal portSignalIn 5~8) Thousands:SignalIn 8Input; hundreds digit:SignalIn 7Input; tens digit:SignalIn 6Input; units digit:SignalIn 5enter		See description
【example】 Fn 00F=0110, represented by the digital input channel6and7The input forward rotation prohibition and reverse rotation prohibition overtravel limit signals are logically inverted.			
Generally suitable for applications where passive limit switches are used for overtravel protection.			

A.2.3.Motor overload automatic load reduction parameters

Pass parametersFn_0E2You can choose how to handle the situation when the drive overload occurs, asFn_0E2=1When overload occurs, the driver will alarm and stop, and the alarm display will be displayed.E_oLod, consistent with general servo overload processing; whenFn_0E2=0, the driver will not stop when overload occurs, and the maximum torque of the motor will automatically reduce and recover, ensuring the safety of the motor and driver, at the cost of only slightly affecting the speed of motor motion control.

Parameter number	Parameter Description	Predetermined area	Set unit	Custom matching
Fn 0E2	Overload alarm enable:0: Overload protection (limited to rated speed torque output) but no alarm;1: Alarm and shutdown if overload occurs.	0~1	1	0

HSCustom matching of servo parameters

In addition, the switching process of automatic overload reduction can also be adjusted smoothly. When users have in-depth needs for this, they can contact us further.HSServo development and technical support personnel.

A.2.4.Motor stall detection parameters

Motor stall detection time parametersFn 0D4Used for judgment in case of stalling faults such as blocked rotor and phase loss. When the overload automatic load reduction function is started, it is generally necessary to set the motor stall detection timeFn 0D4This parameter adjustment is greater than 10000 (unitsms), to avoid that the motor has not entered the automatic load reduction stage, and the driver appears first.En_SPEEstall alarm. Normally, the overload is set to2times10SThe overload capacity, by practical testing, can be the motor stall detection timeFn 0D4 set as value15000.

(indicates the maximum allowed15SFully blocked)

Parameter number	Parameter Description	Predetermined area	Set unit	Custom matching
Fn 0D4	Motor stall detection time (used for stalling, phase loss, etc. Quick fault diagnosis)0:Remove speed protection.	0~30000	ms	recommend15000

A.2.5. CANBus settings

HSservoCANBus baud rateHS_Fn_0F3needs to be set toMBOXconsistent.MBOXofCANThe bus baud rate parameter isMBOX_Fn_061, the default value is500KHZ.

HSservoCANThe bus node number range is0~255, determined by the configuration parameter "Fn 0F4"The setting is determined by the network position number of the servo drive.

HSSeries servo drivesCANThe bus is equipped with a bus protocol that supports independent intellectual property rights (invention patents) and supports grouping operations. The number of group number allocations is determined by the configuration parameter "Fn 0F5"set up. This parameter is the same asMBOXWhen matching, just keep the original default value.

Parameter number	Parameter Description	Predetermined area	Set unit	Custom matching
Fn 0F3	CANBus baud rate	0~1000	KHz	default 500
Fn 0F4	CANbus node number	0~255	—	See description
Fn 0F5	CanRegThe number of assigned group numbers for the protocol	1~255	—	1

A.2.6.HSservoCANBus reporting mode configuration

need toHSservoFn_0F6Set as-1, in order to getMBOXControl the servo operation information of the servo drive. In addition, theFn_0F7Set as1250, basically every1250*0.4ms=500ms, the servo drive automatically sendsCAN A customized running status information on the bus, including the motor's position, speed, load rate and running status word information.

HSCustom matching of servo parameters

Parameter number	Parameter Description	Predetermined area	Set unit	Custom matching
Fn 0F6	CanRegVisitreporting modeDX[n]/DX[n+1]middle nSet value/address value. This parameter can be used to set the reporting mode data source. -1: Customized mode1, used forMBOX;	- 1~255	-	- 1
Fn 0F7	CanRegVisitReport mode data frame interval control parameter.0: Cancel the report mode function; n=1~30000: The time isn*0.4ms;n=-1~-30000: The time is abs(n)*4ms;	- 30000~ 30000	-	1250

A.3.HSPparameter adjustment of servo drive (optional)

A.3.1.External pulse input command exponential filter ratio coefficient

Parameter number	Parameter Description	Predetermined area	Set unit	Custom matching
Fn 056	External pulse input command exponential filter ratio coefficient (when filtering room =N*0.2ms) 0: Cancel exponential filtering	0-30000	0.2ms	recommend250

Note: Generally in dynamic platform applications, this parameter can be selected as50~500.

A.3.2.Motor control speed loop parameters

Under normal circumstances, the first gain is sufficient. You can first set a relatively mild speed loop adjustment parameter. For example: Speed loop proportional gain:Fn_087=5.00;

Speed loop integration time constant:Fn_088=10.00 When stronger rigidity is required, the proportional gain can be increased and the integral time constant reduced.

A.3.3.Motor control position loop parameters

Under normal circumstances, the first gain is sufficient. You can first set a relatively mild position loop adjustment parameter. For example:

Position loop proportional gain:Fn_05C=0.4

When stronger rigidity is required, the proportional gain can be increased.

A.3.4.Motor control current loop parameters

Under normal circumstances, you can first set a relatively mild current loop adjustment parameter. For

example: Current loop proportional gain:Fn_151=0.400

Current loop integration time constant:Fn_152=5.00ms When stronger rigidity is required, the proportional gain can be increased and the integral time constant reduced, but this may result in increased operating noise of the motor.

A.3.5.Position over-tolerance protection parameters

In order to ensure that even if the position is temporarily out of tolerance, it will not cause the driver to alarm and allow the dynamic action to run continuously without stopping, you can Fn_0DASet as0, cancel the alarm function of position out of tolerance.

HSCustom matching of servo parameters

Parameter number	Parameter Description	Predetermined area	Set unit	Custom matching
Fn 0DA	Deviation setting value of position out-of-tolerance (number of position feedback pulses) 0: Indicates canceling the position out-of-tolerance alarm. Deviation set value	1~32767:express 0~32767	Number of pulses	0

A.3.6.Regenerative braking operating point and resistance parameters

Under normal circumstances, the parameters related to regenerative braking have been configured and are sufficient. HSWhen an overvoltage alarm occurs in the servo drive, please contact the relevant technical personnel nearby, add an external regenerative braking resistor, and appropriately adjust the relevant parameters of the regenerative braking control, as shown below:

Parameter number	Parameter Description
Fn 169	DC bus voltage starting relief working point (unit:0.1V)
Fn 16A	Hysteresis value of DC bus voltage during braking (unit:0.1V)
Fn 16B	The resistance of the brake resistor (unit: ohms)
Fn 16C	Discharge the power of the braking resistor (unit:W)
Fn 16D	Allowable short-term overload impact time of braking resistor (unit:0.1s)

A.4.HSServo drive custom matching parameter retention and recovery

HSThe parameters of the servo drive, when customized for a specific application, can retain the current parameter values in the servo's user data storage area. by addingFn_007Set as-1, and power on again to change the currentFXThe entire operating parameters are retained in the user data storage area. It is recommended that users check the currentHSWhen the servo parameters are satisfactory, use this function to retain the parameters for later use.

HSThe standard factory default parameters of the servo drive can be set byFn_007Set as1, power on again to restore the default parameters. When the user wants to restore the self-retained parameters, he canFn_007Set as2, power on again to restore the standby reserved parameters.

A.5.HSQuickly adjust parameters of servo drive in batches

HSThe parameters of the servo drive support passingRS232orRS485way, useMODBUSThe communication protocol implements the data exchange function. After a new set of parameters is configured, subsequent drives do not need to be manually set through the keyboard display.1After the set of parameters is read in and stored, the communication interface is used for batch copy and write processing.

When multiple drives are networked, attention must be paid to the networking of different drives.IDThe difference between numbers. rightMBOXsupplementary HS Servo means setting up the servo for each axis.CANBus node number parameterFn_0F4. You can use the keyboard to display the interface, or you can update it in the communication download data.

for30916version afterHSServo drive, has started to supportMBOXThe dynamic platform applies the customized version of the motor parameter number, exceptCANBus node number parameterFn_0F4The parameters default to1, need to be configured on site according to actual conditions. Currently supported custom parameter numbers include:

HSCustom matching of servo parameters

for dynamic platformsHSServo customized motor number		
HSServoFn 006	Motor	limit switch
30001	60CB060C	Passive
30002	60CB060C	Active
30003	90CB120C	Passive
30004	90CB120C	Active

In order to further facilitate user configurationHSThe servo is used on the dynamic platform, for2014-10-31After the software versionHSThe servo driver can support fast one-click parameter matching for dynamic platform applications, in addition toCANBus node number parameterFn_0F4Parameters also need to be configured on site according to actual conditions. Configuration of other dynamic platform application parameters only requiresFn009Set it up once.

Currently supported fastFn009Quick one-click parameter configuration includes:

HSServoFn 009	limit switch
1	Passive limit switch applicationHSServo drive configuration
2	Active limit switch applicationHSServo drive configuration

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