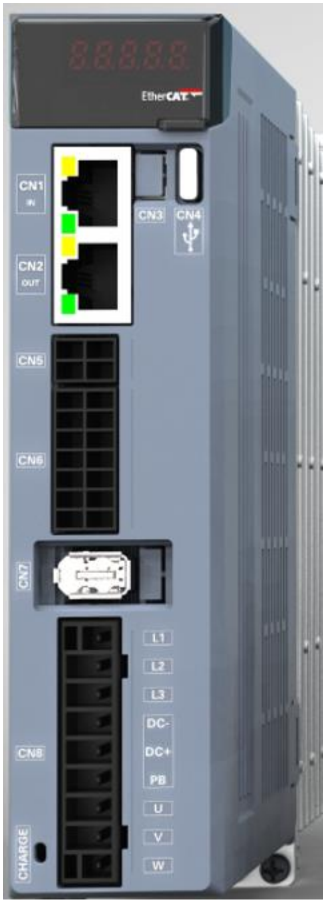
Yasaka YSK2 Servo Design Maintenance and Use Manual

YSK2 Servo Design And Maintenance Instructions



Product Information BrochureInformation code 19010002A01

Preface

First of all, thank you for purchasing the YSK2 Servo Drive product.

YSK2 series servo drive products are high performance small and medium power AC servo products.

The YSK2-E servo drive series adopts industrial Ethernet communication interface and supports EtherCAT communication protocol ,which can realize the network operation of multiple servo drives in cooperation with the host computer.;

The YSK2-D servo drive series adopts industrial Ethernet communication interface and supports Profinet communication protocol, which also can realize the network operation of multiple servo drives in cooperation with the host computer.

The YSK2-A is a special series for pulse control, and it can also realize cooperative control or monitoring of multiple servo drives through the RS485 interface

YSK2-A	YSK2-E	YSK2-D
Pulse	EtherCAT	Profinet

The YSK2 provides single parameter adjustment, parameter online self-learning, vibration suppression, low frequency vibration suppression and other functions, making servo commissioning easy to learn. Combined with the VM-TA series 23-bit encoder high response servo motor, the servo system runs quietly and smoothly, suitable for advanced manufacturing industries such as lithium-ion, photovoltaic, electronic non-standard, semiconductor, etc., to achieve fast and accurate positioning and trajectory control.

Chapter 1: Security Instructions

Thank you very much for using this product, this manual provides information about the YSK2-E drive.

We hope you will read this manual carefully before use and use this product correctly.

This manual is the user's manual for the YSK2-E Servo Drive and provides product safety information, drive and motor installation instructions, hardware wiring, and troubleshooting. For first time users, please read the manual carefully. If you have any doubts about some functions and performance, please consult our technical staff for assistance.

1 The information provided by our company is subject to change without notice due to our commitment to the continuous improvement of the Servo Drive.

caveat emptor
(1) To illustrate the detailed parts of the product, the diagrams in the manual are sometimes shown with the outer cover or safety cover removed. When using this product, be sure to install the housing or cover as specified and follow the instructions. (2) The diagrams listed in this manual are for illustration purposes only and may differ from the product you ordered. (3) The contents of this manual are subject to change due to product upgrades or specification changes, and for the convenience and accuracy of the manual.

2 When opening and inspecting the goods, please carefully confirm that.

Confirmation of projects	instructions
Does the product arrive with the model number you ordered?	The box contains the machine you ordered. Please confirm by the YSK2-E Servo Drive nameplate model number.
Is the product damaged in any way?	Please check the whole appearance of the machine and whether the product has been damaged during transportation. If you find some kind of omission or damage, please contact our company or your supplier to solve it quickly.

3 Security precautions:

Please read and follow these safety precautions when installing, operating, or maintaining the product.

For personal and equipment safety, follow all safety precautions as marked on the product and described in the manual when installing, operating and maintaining the product.

The "Cautions", "Warnings" and "Dangers" in the manual do not represent all safety matters to be observed, but are only supplementary to all safety precautions.

This product should be used in an environment that conforms to the design specifications, otherwise it may cause malfunction, and abnormal function or damage to parts caused by failure to comply with the relevant regulations is not covered by the product quality warranty. We will not assume any legal responsibility for personal safety accidents or property damage caused by non-compliant operation of the product.

Definition of security level ：

"Dangerous" means that death or serious bodily injury will result if the operation is not carried out in accordance with the regulations.

"Warning" indicates that death or serious bodily injury may result if not handled as specified.

"Caution" may result in minor bodily injury or equipment damage if not operated as specified.

unpacking and accepting
 Before opening the box, please check whether the outer packaging of the product is intact and free from damage, moisture, dampness, deformation, etc. Please open the package in hierarchical order, no pounding is allowed! When opening the box, please check the surface of the product and product accessories for any damage, rust, bruises, etc. After unpacking, please check carefully against the packing list to see if the product and

product accessories are complete in quantity and information.

WARNING

Please check the product and product accessories for damage, rust, signs of use, etc. before opening the box, do not install!

Do not install the product if you find water inside, missing parts or damaged parts when you open the box!

Please check the packing list carefully and do not install if you find that the packing list does not match the product name!

When storing and transporting

CAUTION

Please store and transport the product according to the storage and transportation conditions, with storage temperature and humidity meeting the requirements.

Avoid storage and transportation in places such as splashing rain, direct sunlight, strong electric field, strong magnetic field, strong vibration, etc.

Avoid storing the product for longer than 3 months; for longer storage times, perform tighter protection and necessary checks.

Please pack the products strictly for vehicle transportation, and closed boxes must be used for long distance transportation.

It is strictly forbidden to mix this product with equipment or articles that may affect or damage this product for transportation.

WARNING

Be sure to use professional handling equipment to move large or heavy equipment and products!

When handling the product with your bare hands, be sure to hold onto the product casing to avoid dropping the product parts, otherwise there is a risk of causing injury!

When handling the product, please be sure to carry it gently and keep an eye on objects under your feet at all times to prevent tripping or dropping, otherwise there is a risk of injury or product damage!

No one is allowed to stand or stay underneath the equipment when it is lifted by a lifting tool.

when installing

WARNING

Be sure to read the product's instructions and safety precautions carefully before installation! Modification of this product is strictly prohibited!

It is strictly forbidden to unscrew the fixing bolts and red marking bolts of the product parts and components!

Do not install this product in places with strong electric fields or strong electromagnetic wave interference!

When this product is installed in the cabinet or terminal equipment, the cabinet or terminal equipment needs to provide corresponding protective devices such as fireproof enclosure, electrical protective enclosure and mechanical protective enclosure, and the protection level should comply with the relevant IEC standards and local laws and regulations.

DANGER

Product installation, wiring, maintenance, inspection or part replacement by non-professionals is strictly prohibited!

Installation, wiring, maintenance, inspection or parts replacement of this product should only be carried out by professionals with adequate electrical knowledge who have been trained in the relevant aspects of electrical equipment!

The installer must be familiar with the product installation requirements and relevant technical data.

When you need to install equipment equipment with strong electromagnetic wave interference such as transformers, please install a shielding protection device to avoid false operation of this product!

When wiring

DANGER

Product installation, wiring, maintenance, inspection or part replacement by non-professionals is strictly prohibited!

Do not perform wiring work with the power on, as there is a risk of electric shock.

Before wiring, disconnect all power to the equipment. There is residual voltage in the capacitors inside the device after the power is cut off, so wait at least 15 minutes before wiring.

Always ensure that the equipment and product are well grounded, otherwise there is a risk of electric shock.

Follow the procedures specified in the electrostatic preventive measures (ESD) and wear an electrostatic hand ring for operations such as wiring to avoid damage to the equipment or the circuitry inside the product.

WARNING

It is strictly forbidden to connect the input power to the output of the device or product, otherwise it may cause damage to the device or even cause a fire.

When connecting the drive to the motor, be sure to pack the drive with the exact same phase sequence as the motor terminals to avoid causing the motor to rotate in reverse.

The cable used for wiring must meet the appropriate wire diameter and shielding requirements, and the shielding layer of shielded cables must be reliably grounded at one end!

After wiring is complete, make sure there are no dropped screws or exposed cables inside either the unit or the product.

On power up

DANGER

Before powering up, make sure that the equipment and product are well installed, wired securely, and that the motor unit is allowed to restart.

Before powering up, please make sure the power supply meets the requirements of the equipment to avoid causing damage to the equipment or starting a fire!

Before power is applied, the mechanism of the equipment or product may move suddenly, so be careful to keep away from the mechanism.

Do not open the door of the cabinet or the protective cover of the product after the power is applied, otherwise there is a risk of electric shock.

It is strictly forbidden to disassemble any device or part of the equipment and product while it is energized, otherwise there is a risk of electric shock!

runtime

DANGER

It is strictly forbidden to touch any terminal of the equipment in the operating state, otherwise there is a risk of electric shock!

It is strictly forbidden to disassemble any device or part of the equipment and product in the operating condition, otherwise there is a risk of electric shock!

Never touch the equipment housing, fan or resistor to test the temperature, as this may cause burns!

It is strictly forbidden for non-specialized technical equipment personnel to detect signals during operation, as this may cause personal injury or equipment damage!

WARNING

During operation, avoid dropping other objects or metal objects into the unit, as this may cause damage to the unit!

Do not use the contactor on/off method to control the start/stop of the unit, as this may cause damage to the unit!

when taking care of

DANGER

Installation, wiring, maintenance, inspection or part replacement of equipment by non-professional personnel is strictly prohibited!

It is strictly forbidden to carry out maintenance on the equipment while it is energized, otherwise there is a risk of electric shock!

After turning off the power to all equipment, wait at least 15 minutes before performing operations such as equipment maintenance.

WARNING

Please follow the equipment maintenance and care requirements for daily and periodic inspection and maintenance of equipment and products, and keep maintenance records.

During repairs

DANGER

Installation, wiring, maintenance, inspection or part replacement of equipment by non-professional personnel is strictly prohibited!

It is strictly forbidden to repair the equipment in an energized state, otherwise there is a risk of electric shock!

After disconnecting the power to all equipment, wait at least 15 minutes before performing equipment checks, repairs, etc.

WARNING

Please follow the product warranty agreement for equipment warranty.

In the event of equipment failure or damage, the equipment and products are troubleshot by professional personnel in accordance with maintenance instructions and maintenance records are kept.

Please follow the product wear parts replacement instructions.

Do not continue to use an already damaged machine as this will cause more damage.

After replacing the unit, be sure to perform the unit wiring check and parameter setting again.

at the time of retirement

WARNING

Please follow the relevant national regulations and standards for the scrapping of equipment and products to avoid property damage or casualties!

Please dispose of end-of-life equipment and products in accordance with industrial waste standards for recycling to avoid polluting the environment.

Chapter 2 : Models and Installation

2.1 About the Drive

2.1.1 Drive Models

YSK2	**-**	**075**	**A**	**-**
Product Series		**Power**	**Voltage level**	**Type**
YSK2 Series		040: 400W 075: 750W 100: 1KW 150: 1.5KW 200: 2KW 300: 3KW 450: 4.5KW 550: 5.5KW 750: 7.5KW	A: AC220V T: AC380V	Blank: Pulse type E: EtherCAT type S: Special version

2.1.2 Drive Part Name

Names of the drive components.

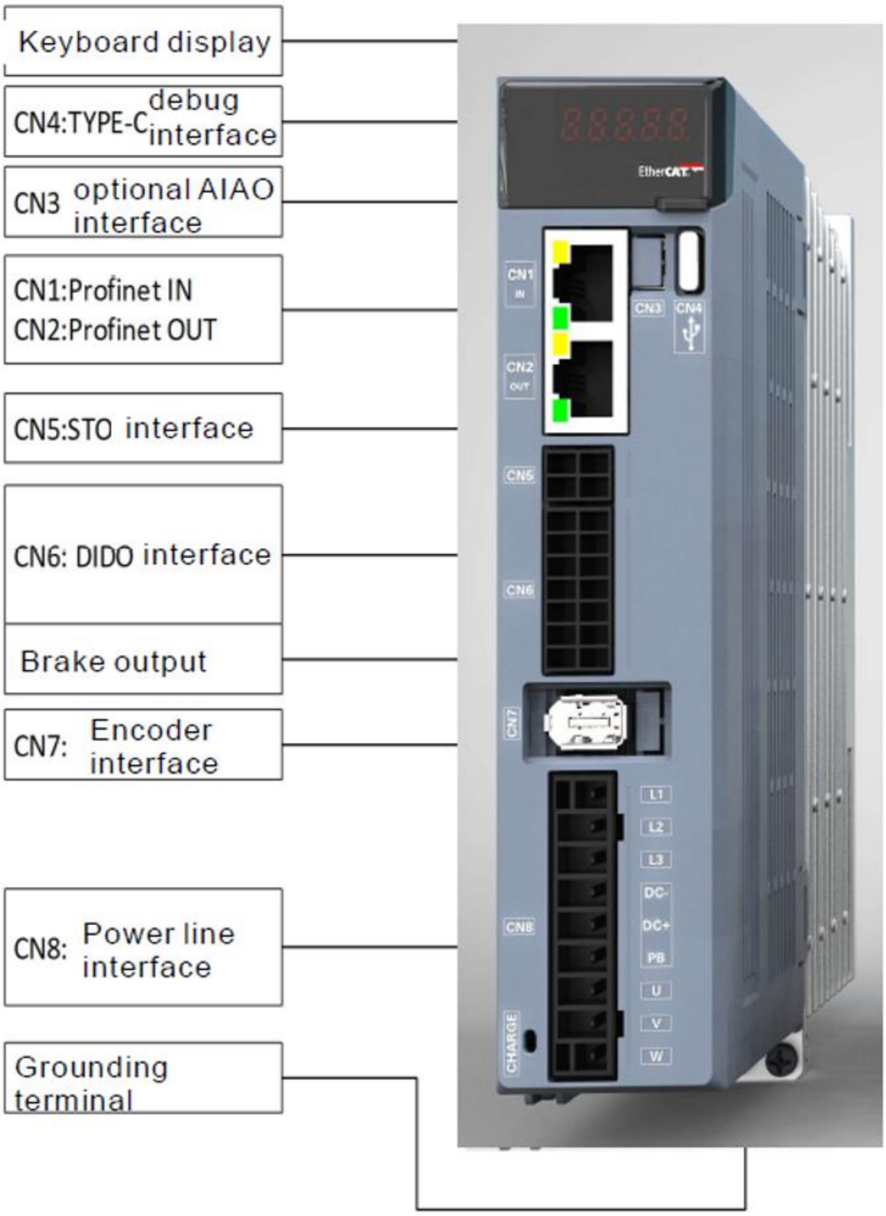


chart0-1 Name of each part of the drive

2.1.3 Braking resistor selection

The drive can choose to use the default braking resistor or an external braking resistor of another size.

(1) A braking resistor is connected by default between DC+ and PB on port CN8 with the following specifications.

Voltage input level 220V.

Drive power	50W	100W	200W	400W	750W	1kW	1.5kW	2kW
Braking resistor resistance value	50Ω	50Ω	50Ω	50Ω	50Ω	50Ω	30Ω	30Ω
Braking Allowable Power	50W	50W	50W	50W	50W	50W	80W	80W

Voltage input class 380V.

Drive power	1kW	2kW	3kW	5kW	7.5kW
Braking resistor resistance value	80Ω	80Ω	80Ω	50Ω	50Ω
Braking Allowable Power	80W	80W	80W	120W	120W

(2) Other sizes of braking resistors can also be connected between DC+ and PB on port CN8 according to the actual needs, selected as follows.

Voltage input level 220V.

Drive power	50W	100W	200W	400W	750W	1KW	1.5KW	2KW
Braking resistor resistance value	≥30Ω	≥30Ω	≥30Ω	≥30Ω	≥30Ω	≥30Ω	≥20Ω	≥20Ω
Minimum braking power	50W	50W	50W	50W	50W	50W	80W	80W

Voltage input class 380V.

Drive power	2KW	3KW	5KW	7.5KW
Braking resistor resistance value	≥60Ω	≥50Ω	≥30Ω	≥30Ω
Minimum braking power	120W	120W	180W	180W

When using an external braking resistor, you need to set drive parameters F01.18 (braking resistor configuration), F01.19 (external braking resistor power capacity), F01.20 (external braking resistor resistance value), and F01.21 (external braking resistor heat-up time constant).

Caution.

1. For applications requiring external braking resistors, please refer to the table above for installation of braking resistors.
2. the use of the above table of braking resistor resistance does not always guarantee performance.
3. When using external braking resistors, if the heating temperature is too high, please improve the heat dissipation condition of the resistor or choose a higher power resistor.

2.2 About the motor

YSK1	-	M	H	075		N	
①		②	③	④	⑤	⑥	⑦

No.	Name	Remarks	
①	**Product series**	YSK1 series	
②	**Product type**	M: motor	
③	**Inertia**	H: High inertia M: Low inertia	G: Medium inertia
④	**Rated power**	040: 400W 085: 850W 150: 1.5KW 180: 1.8KW	075: 750W 100: 1KW 130: 1.3KW 200: 2KW
⑤	**Rated voltage**	Blank: AC220V	B: AC380V
⑥	**Brake/Oil seal**	N: With oil seal B: With brake and oil seal	
⑦	**Encoder**	Blank: 17-bit incremental, magnetic 2: 23-bit, optical encoder	A: 17-bit absolute, magnetic 3: 23-bit multi-turn optical encoder

2.3 Selection table for drive and motor packages (continuously updated)

2.4 Cable Selection Table

The suffix -XX.X corresponds to the length L with one decimal, in m; the default fixed line, to which the suffix -T corresponds to the drag chain line is appended.

Chapter 3: Wiring Instructions

3.1 System Wiring Diagram

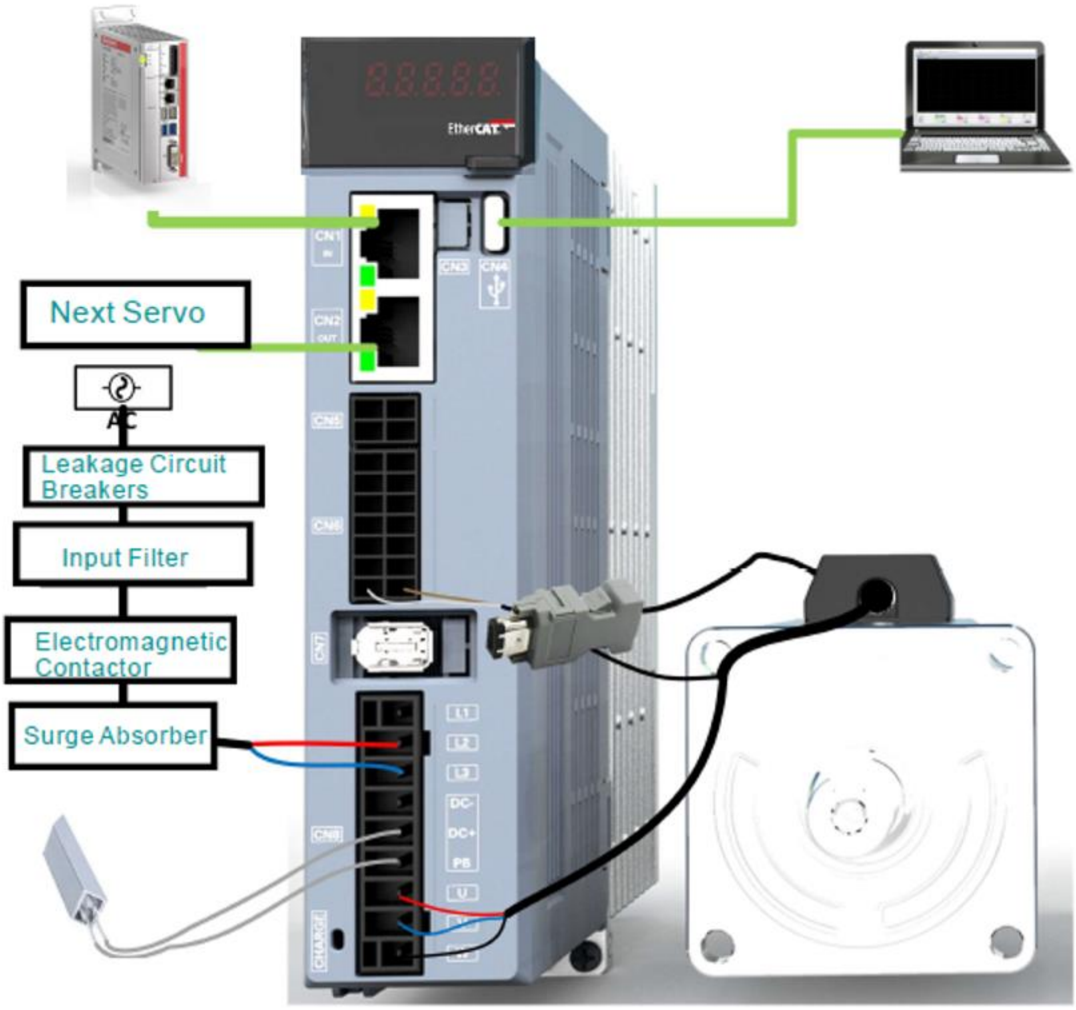


chart0-1 Servo system wiring diagram

Servo motor and drive system wiring instructions.

Item	Instructions
Peripheral machine composition	In order to comply with the European IEC standard, set up according to [Fig. 2.1.1 System wiring diagram] on the basis of the selected machine for each specification.

Setting the environment	The drive is set up in a contamination level 2 or contamination level 1 environment as specified in IEC 60664-1.
Power supply 1: AC200 to 240V (main and control circuit power)	Our products are intended for use in power supply environments in the overvoltage category II, as specified in IEC 60664-1.
Power supply 2: DC24V I/O power supply Motor brake disengagement power	The following conditions must be met for the selected DC24V external power supply specification. Use a SELV power supply (*) with a capacity of 150W or less. This is the condition when CE corresponds. ※SELV：safety extra low voltage (Safety special low/non-hazardous voltage, hazardous voltage with reinforced insulation)
wiring	Motor power cable, AC220V input cable, FG cable and main circuit in case of multi-axis composition Power distribution cable, please use AWG18/600V voltage resistant cable under 750W, over 1KW Please use AWG14/600V voltage resistant wire.
Earth leakage circuit breaker	To protect the power supply line, cut the circuit when overcurrent flows. Be sure to use UEC specifications and UL-approved circuit brakes between the power supply and the noise filter according to [Figure 2.1.1 System Wiring Diagram]. To comply with EMC standards, use our recommended circuit brakes with a leakage detection function.
Noise Filters	Prevents noise interference from the power cord. To comply with EMC standards, use our recommended noise filters.
Electromagnetic contactors	Perform mains power cutover (ON/OFF). Please connect an overvoltage protector for use.
Surge absorber	For EMC compliance, use our recommended overvoltage protector for use.
Signal Line Noise Filter /Ferrite Cores	To comply with EMC standards, use our recommended noise filters.
brake resistor	This product comes with an energy braking resistor, and other sizes of braking resistors can be connected as required. If the smoothing capacitor inside the power supply unit cannot adequately absorb and process regenerative power, a braking resistor is required. When the energy braking overload warning A.91 occurs during servo operation, connect another size of braking resistor, increase the resistor power and improve the heat dissipation conditions, and set the braking resistor related parameters.

	Braking resistor reference specification: Refer to [2.1.3 Braking resistor selection].
earth (electric connection)	The grounding of our products is performed using protective grounding terminals in protective boxes and electrical boxes with EMC measures in place. The protective earth terminal section is indicated using the symbols shown below. Please connect the ground terminal of the motor to the ground terminal of the drive and connect it to earth reliably to reduce the possibility of potential electromagnetic interference.

Wiring points.

(1) The control circuit power supply and the main power supply should be wired from the same AC220V power supply.

(2) 400W (rated 2.7A) and below power models only support single-phase input, from L2, L3 access to the main power; 750W and above power models main power can choose single-phase or three-phase AC220V input, when choose single-phase, L1, L2, L3 any two inputs.

(3) If the length of the user I/O cable exceeds 50 cm, use a twisted pair cable with a shield.

(4) The encoder cable length is 20m or less.

3.2 Description of port CN1/CN2

The definition of this network port is different for different drive models, so please check the model before using it. Port CN1/CN2 detail drawing.

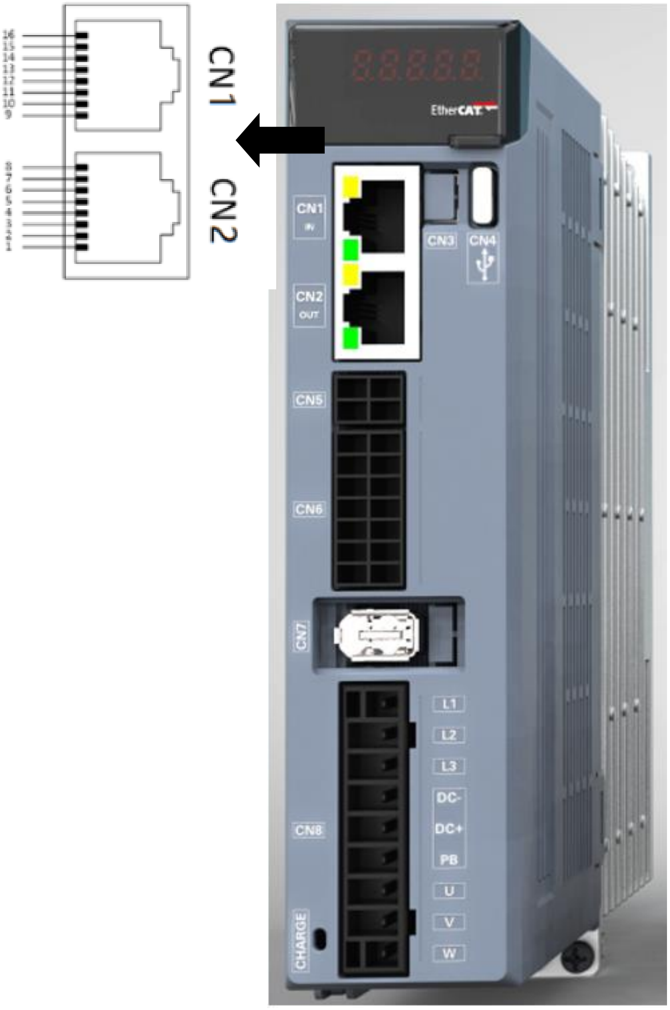


chart0-2 Detail view of CN1/CN2

The CN1/CN2 pins are defined as follows.
(1) Pulse type

models	markings	Terminal Number	Signal Name	elements
pulsed	CN1	1	NC	-
		2	NC	
		3	NC	
		4	RS485+	RS485+ signal from the upper control unit
		5	RS485-	RS485-signal from the upper control unit

		6	NC	-
		7	NC	
		8	NC	
	CN2	9	NC	-
		10	NC	
		11	NC	
		12	RS485+	RS485+ signal from the upper control unit
		13	RS485-	RS485-signal from the upper control unit
		14	NC	-
		15	NC	
		16	NC	

(2) Profinet or EtherCAT bus type

models	**markings**	**Terminal Number**	**Signal Name**	**elements**
Bus Type	CN1	1	TX+	TX+ signal from the upper control unit
		2	TX-	TX-signal from the upper control unit
		3	RX+	RX+ signal from the upper control unit
		4	NC	-
		5	NC	
		6	RX-	RX-signal from the upper control unit
		7	NC	-
		8	GND	GND signal from the upper control unit
	CN2	9	TX+	TX+ signal from the upper control unit
		10	TX-	TX-signal from the upper control unit
		11	RX+	RX+ signal from the upper control unit
		12	NC	-
		13	NC	
		14	RX-	RX-signal from the upper control unit
		15	NC	-
		16	GND	GND signal from the upper control unit

3.3 Description of port CN5(Only for YSK2-E and YSK2-D)

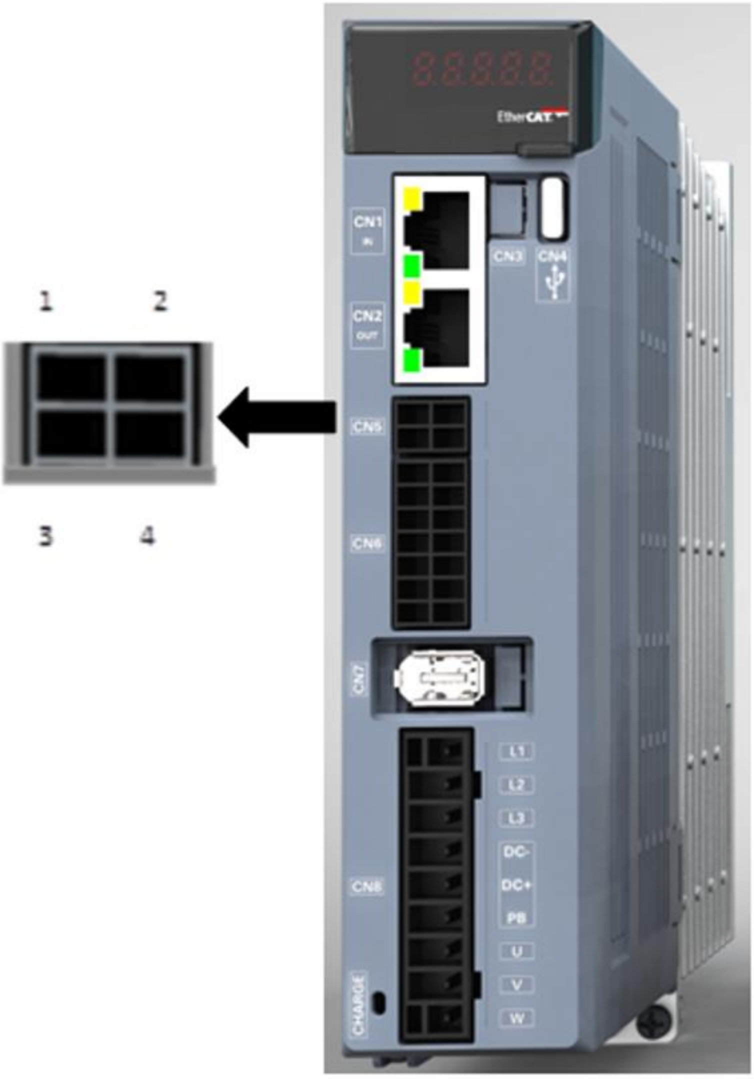


chart0-3 CN5 terminal detail drawing

Port CN5 Pin Name.

Terminal Number	instructions
1	STO1: STO1 input
2	STO2: STO2 input
3	+24V: Internal 24V power supply
4	G24V: Internal 24V power ground

(Caution： YSK2-A series drives are not configured with STO interface)

3.4 STO Wiring Instructions

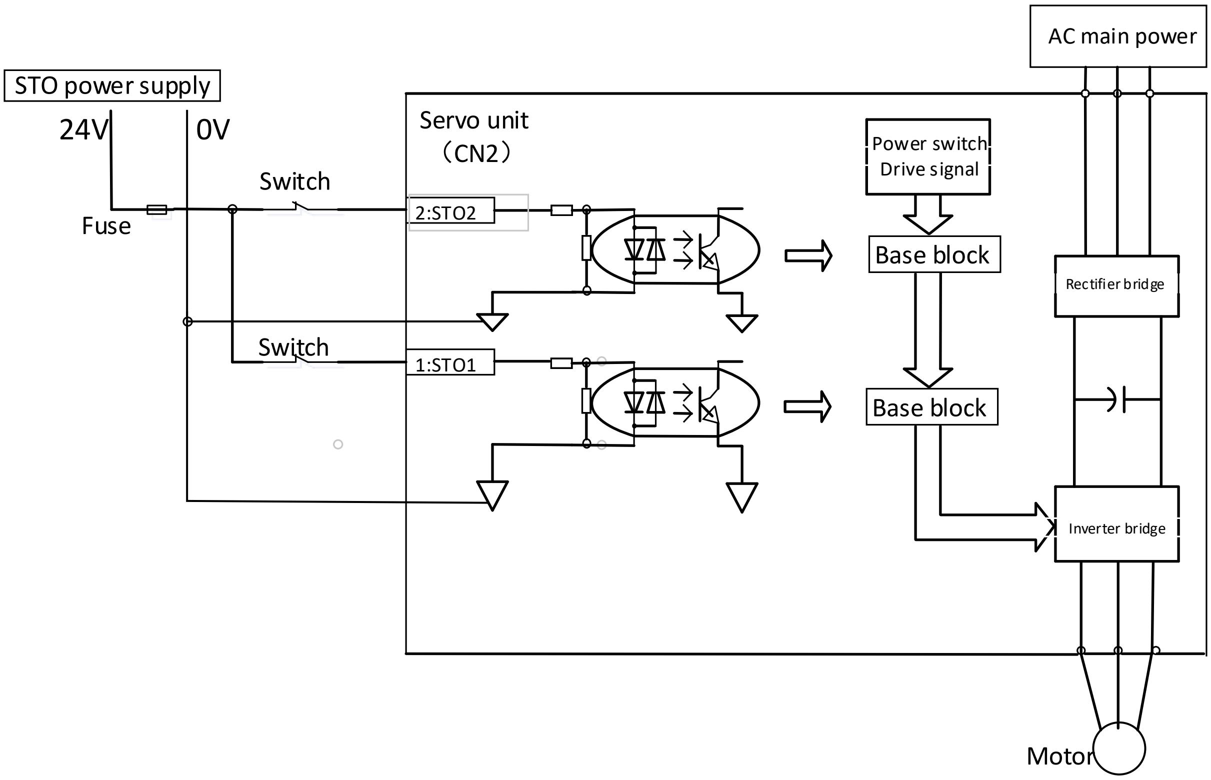


chart0-4 CN5 terminal (STO) wiring diagram

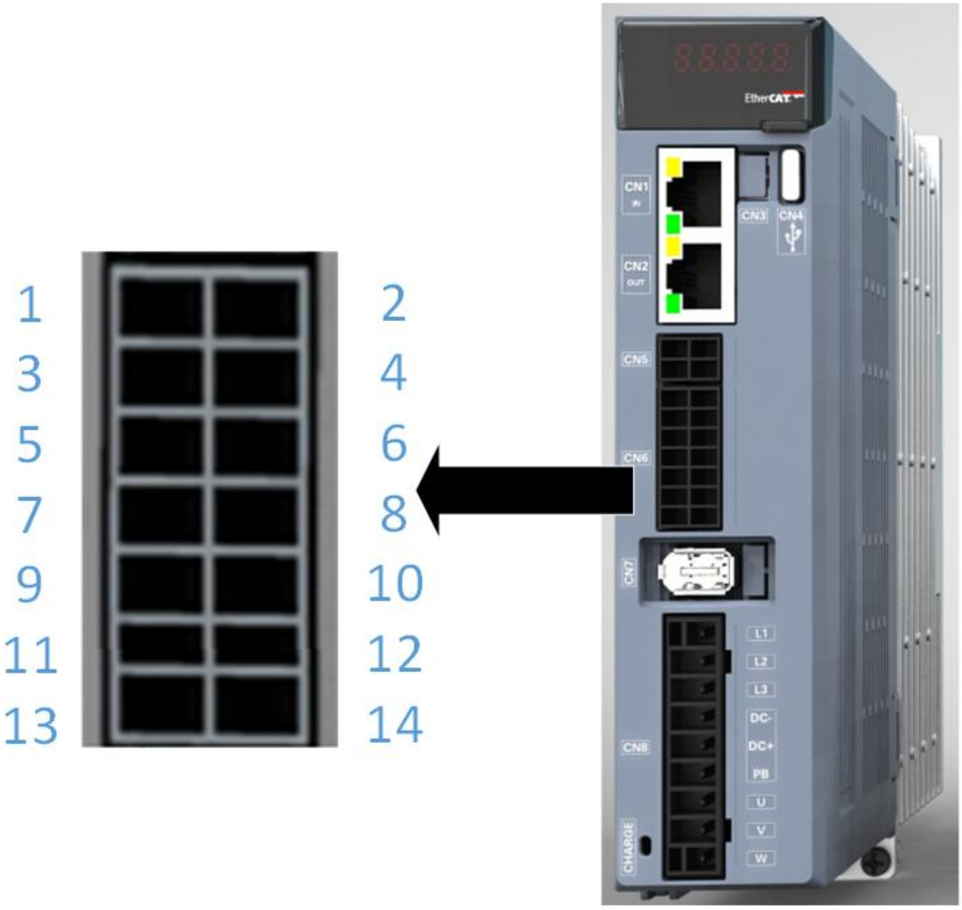
STO Functional Description.

The external power supply for the STO must use a 24V DC supply.The STO function logic is described in the following table.

STO1 status	STO2 status	base state	Servo ready signal (RDY)
Low: Ineffective	Low: Ineffective	block	Invalid output
Low: Ineffective	High: Effective	block	Invalid output
High: Effective	High: Effective	non-blockade	Output valid
High: Effective	Low: Ineffective	block	Invalid output

3.5 Description of port CN6

For YSK2-D and YSK2-E



For YSK2-D and YSK2-E

Figure 3.5 Detail view of port CN6

Port CN6 Pin Name.

Terminal Number	**instructions**		**Terminal Number**	**instructions**	
1	G24V	24V power ground	**2**	DIOP	Digital input common
3	+24V	24V power supply positive	**4**	DI5	Digital input 5
5	DO2-	Digital output 2	**6**	DI4	Digital input 4

		negative			
7	DO2+	Digital output 2 positive	**8**	DI3	Digital input 3
9	DO1-	Digital output 1 negative	**10**	DI2	Digital input 2
11	DO1+	Digital output 1 positive	**12**	DI1	Digital input 1
13	BZ+	Positive output of holding brake	**14**	BZ-	Holding brake output negative

CN6 wiring example.

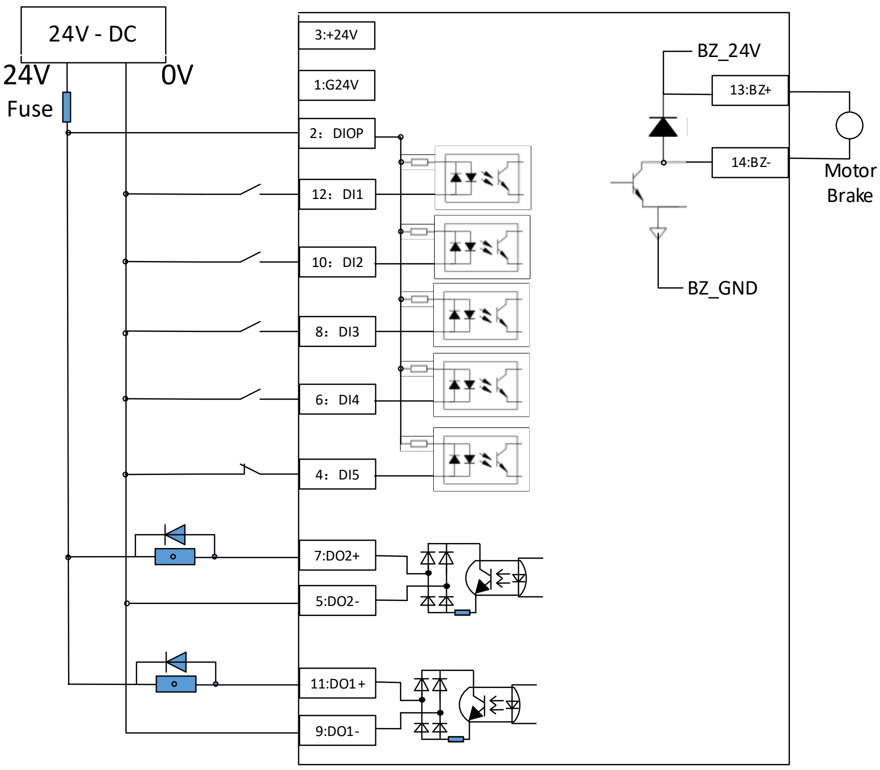


Figure0- 6 CN6 terminal (IO) wiring schematic

For YSK2-A

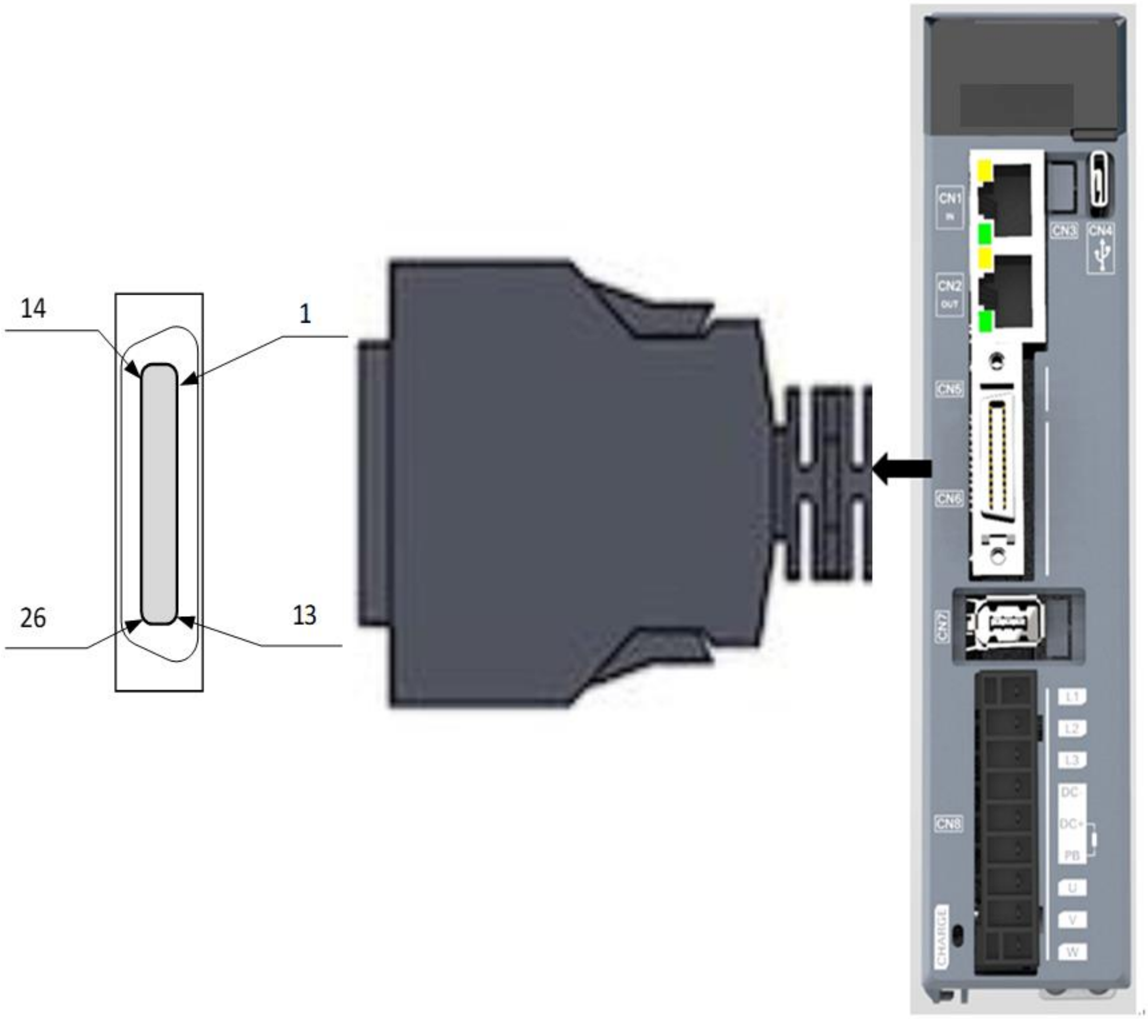


Figure 3.5 Detail view of port CN6

Port CN6 Pin Name.

Pin	Remarks		Pin	Remarks	
1	DIOP	Digital input common	14	DI1	Digital input 1
2	DI2	Digital input 2	15	DI3	Digital input 3
3	DI4	Digital input 4	16	+24V	24V power supply positive
4	DOCOM	Digital output common	17	DO1	Digital output 1
5	DO2	Digital output 2	18	DO3	Digital output 3
6	DI7	Digital output 7	19	G24V	24V power ground
7	OUT_A	Pulse A-phase positive	20	/OUT_A	Pulse A-phase negative
8	OUT_B	Pulse B-phase positive	21	/OUT_B	Pulse B-phase negative
9	OUT_Z	Pulse Z-phase positive	22	/OUT_Z	Pulse Z-phase negative
10	HSIGN	High-speed pulse input/HSIGN	23	/HSIGN	High-speed pulse input/HSIGN

11	HPULSE	High-speed pulse input/HPULSE	24	/HPULSE	High-speed pulse input/HPULSE
12	DI5	Digital input 5(High speed SIGN)	25	DI6	Digital input 6(High speed PLUS)
13	GND	5V power ground	26	OC_Z	Open collector pulse output Z

CN6 wiring example.

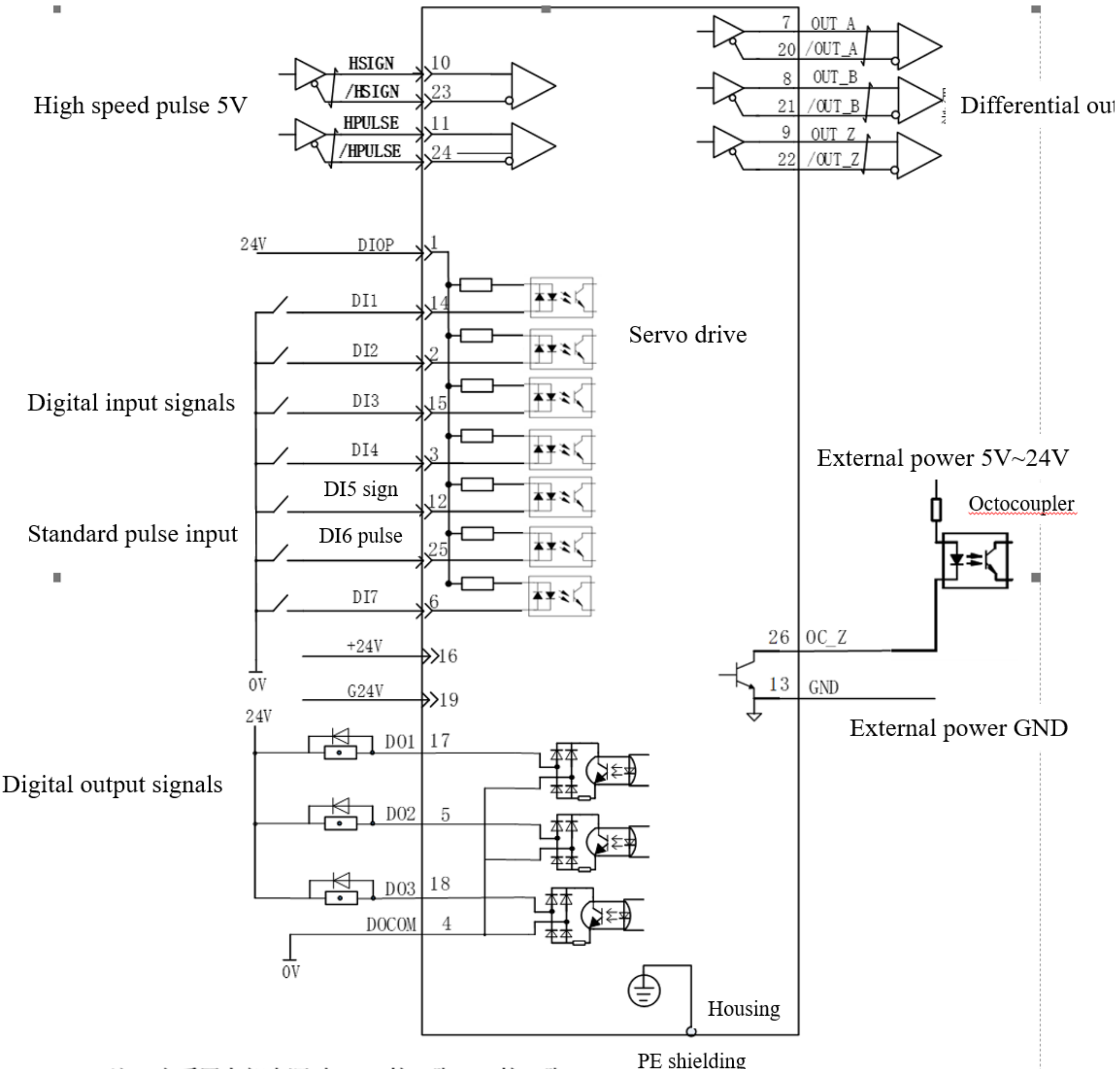


Figure0- 6 CN6 terminal (IO) wiring schematic

3.6 Description of port CN7

This port is used for driver and motor encoder connection, the cables need to be 30cm apart from the main circuit wiring during use.

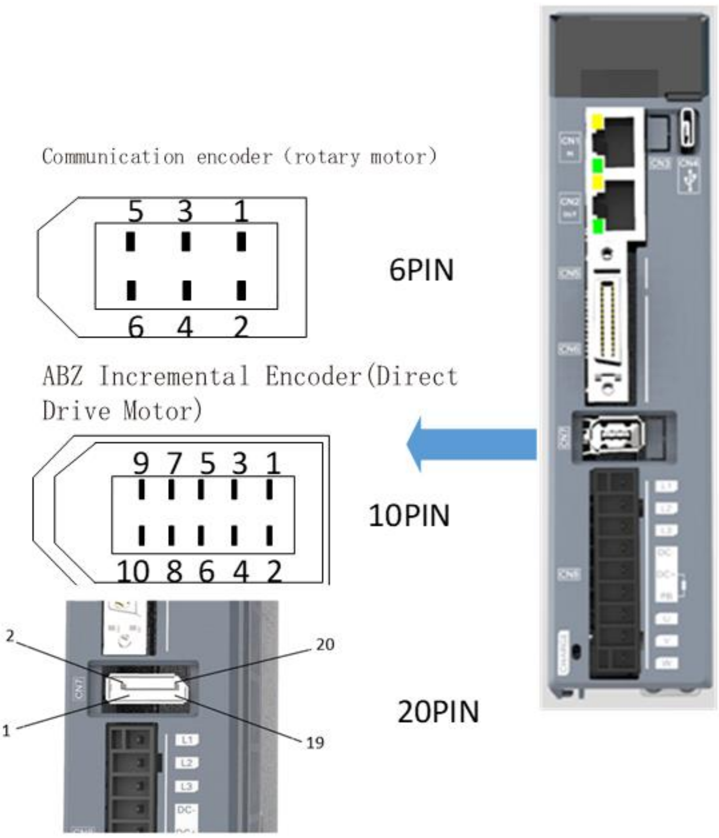


Figure0- 7 Detail view of port CN7

CN7 standard 6PIN port pin definition, generally connected to a rotary motor (with communicating encoder).

types	Terminal Number	instructions	
	1	VCC	Encoder power supply 5V output
	2	GND	Encoder power ground

Communication encoder	3	NC	-
	4	NC	-
	5	+D	Encoder signal: Data input and output
	6	-D	Encoder signal: Data input and output
	-	FG	Shield wire is connected to the metal part of the connector housing

CN7 optional 10PIN port pin definition, generally connected to linear motor or DDR motor (with ABZ incremental encoder).

Types	Terminal Number	instructions	
ABZ incrementa-l encoders	1	VCC	Encoder power supply 5V output
	2	GND	Encoder power ground
	3	Z+	Encoder signal: quadrature pulse Z-phase positive
	4	Z-	Encoder signal: quadrature pulse Z-phase negative
	5	A+	Encoder signal: quadrature pulse A-phase positive
	6	A-	Encoder signal: quadrature pulse A-phase negative
	7	B+	Encoder signal: quadrature pulse B-phase positive
	8	B-	Encoder signal: quadrature pulse B-phase negative
	9	NC	-
	10	NC	-
	-	FG	Shield wire is connected to the metal part of the connector

CN7 optional 20PIN port pin definition,， generally connected to linear motor or DDR motor (Compatible with ABZ incremental encoders with Hall signals):

Types	Terminal Number	instructions	
ABZ incrementa-l encoders	1	NC	
	2	NC	
	3	NC	
	4	NC	
	5	A−	Encoder signal: quadrature pulse A-phase negative
	6	A+	Encoder signal: quadrature pulse A-phase positive
	7	B−	Encoder signal: quadrature pulse B-phase negative
	8	B+	Encoder signal: quadrature pulse B-phase positive

	9	Z-	Encoder signal: quadrature pulse Z-phase negative
	10	Z+	Encoder signal: quadrature pulse Z-phase positive
	11	GND	Encoder power ground
	12	VCC	Encoder power supply 5V output
	13	GND	Encoder power ground
	14	VCC	Encoder power supply 5V output
	15	HALL_V	Hall input V phase
	16	HALL_W	Hall input W phase
	17	HALL_U	Hall input U phase
	18	NC	
	19	NC	
	20	NC	
	—	FG	Shield wire is connected to the metal part of the connector

3.7 Description of port CN8

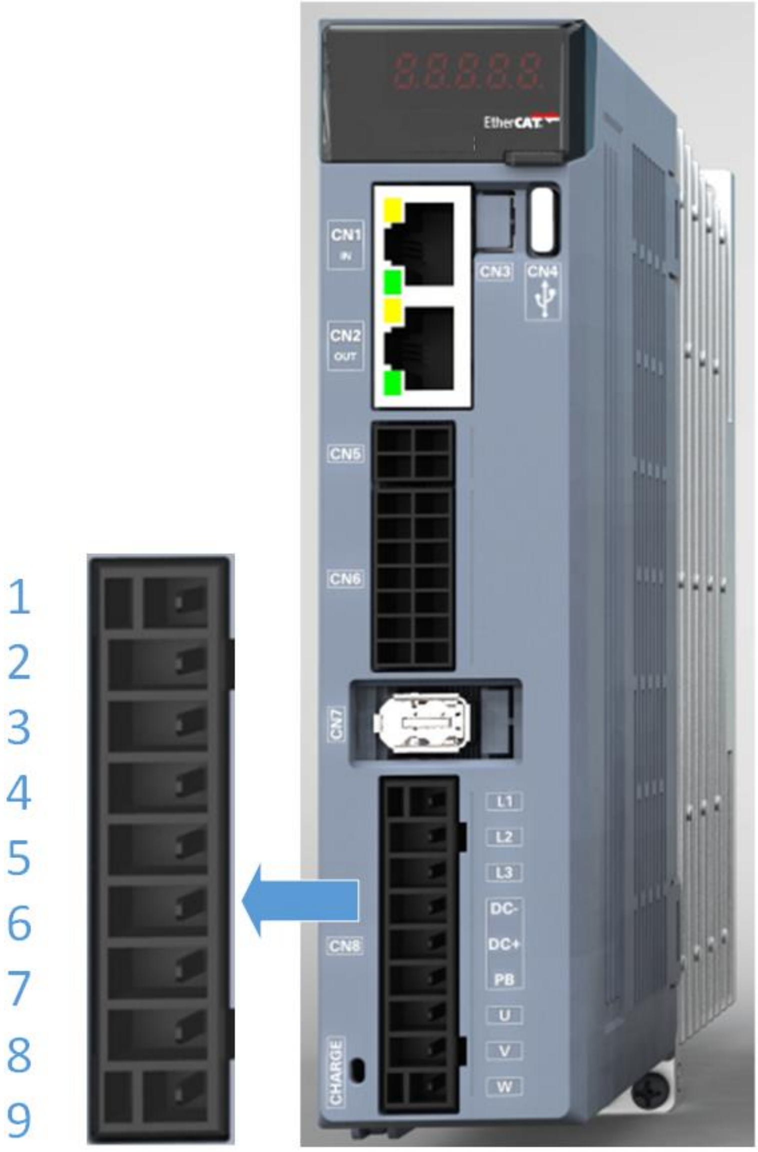


Figure0- 8 Port CN8 detail view

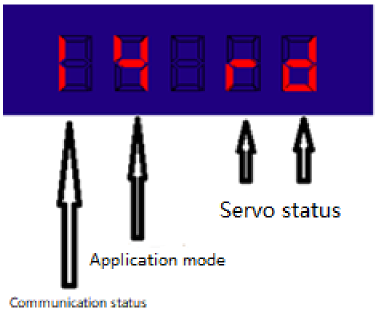
Port CN8 Pin Definition

1	L1	Three-phase input models are connected to 220V AC input, single-phase input models are vacant
2	L2	Connect 220V AC input
3	L3	Connect 220V AC input
4	DC-	Negative bus voltage terminal for common DC bus applications
5	DC+	Positive bus voltage terminal for common DC bus applications
6	PB	Braking resistor terminals, the resistor ends are connected to DC+ and PB respectively
7	U	Motor power line U phase
8	V	Motor power line V phase
9	W	Motor power line W phase

Chapter 4: Panel Operation

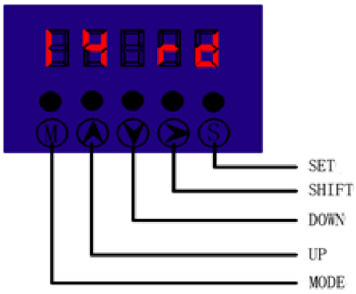
4.1 YSK2 Servo Panel Display

The panel display has three main sections, from left to right: communication status, application mode, and servo status, which are described in the following.



sports event	instructions
Communication status	1 Network initialization (Init) 2 Network pre-run (Pro-Op) 4 Safe operation of the network (Safe-Op) 8 Network Operations (Op)
Application mode	0 No operating mode 1 Contour Position Mode (PP) 3 Profile velocity mode (PV) 4 Contour Torque Mode (PT) 6 Back to original mode (Home) 8 Synchronous cycle position mode (CSP) 9 Synchronous cyclic velocity mode (CSV) A Synchronous Periodic Torque Mode (CST)
Servo Status	nrd: servo not ready rd: servo ready run: enable state A.XX: Warning code E.XX:Fault code

4.2 YSK2 Key Description



(1) MODE key: It is generally used to exit the higher level panel display and return to the lower level panel display; if the current is already the initial display panel, the MODE key can be used to enter the higher level panel display.

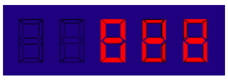
(2) SET key: It is enerally used to access the panel display of the memory, or to confirm parameter changes.

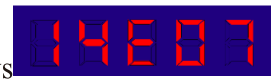
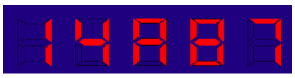
(3) SHIFT key: It is generally used to move the modified digit position. For 32 digits, long press SHIFT to turn the page to display the high digit, and long press again to turn the page to display the sign digit. When zero-level panel, press SHIFT to switch the display of monitoring parameters.

(4) UP key: Increments the number by multiplying the corresponding permission value by step 1.

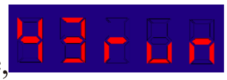
(5) DOWN key: Decrement the number by multiplying the corresponding permission value by step 1.

4.3 Show Description

After power up the panel  prompts Indicates that it is initializing,. Thereafter the level 0 panel contents are displayed.

Level 0 panel introduction: when a fault occurs, the panel displays  (the corresponding fault code is introduced in the later chapters); when there is a warning, the panel displays  , then press the SET key, no flashing, press the MODE key to enter the level 1 panel; when there is no fault: after the initialization is completed and all settings are normal, the panel displays

The first line of the level 0 panel can monitor up to 12 status parameters, up to 12 in case of a fault or warning and up to 11 in case of normal. When there is a fault or warning, the first one is the fault or warning and the second one is the operational status flag. When normal, the first is the operating status flag. The remaining 10 are set by F11.01~F11.10, the setting value can be any serial number value except 0 in the F24 group, if set to 0, it means there is no monitoring parameter in the corresponding position, and it will be skipped directly when pressing SHIFT. If F11_01 is set to 1, then F24_01 (actual speed) is monitored. These monitored parameters are toggled by the SHIFT key. If the monitored parameter is a 32-bit parameter, such as F24_17 (feedback pulse counter), it can be displayed by pressing and holding the SHIFT key to turn the page.

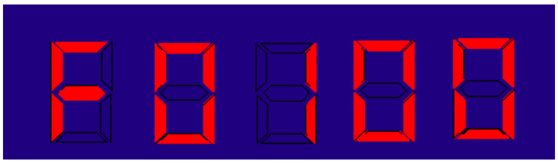
During normal operation of the machine,  will be displayed to show that the server is working properly.

Level 1 panel shows.

The first line shows the parameter group number, such as F01, after entering, the rightmost bit flashes, indicating that it can be modified, if you need to modify other bits, you can shift them by SHIFT key, press SET key to enter the level 2 panel. Press MODE key to return to level 0 panel.

Level 2 panels show.

The parameters are shown in the following figure.



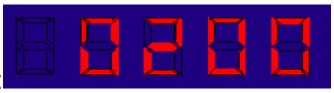
The display shows the parameter group number and the offset within the group, after entering this interface, the blinking position position indicates that it can be modified, if you need to modify other positions, you can modify them by SHIFT key, press SET key to enter the 3 level panel.

Level 3 panels.

Access to the 3 level panel allows you to debug parameters and adjust different parameters by your desired mode (parameters are described in later chapters).

4.4 Jogging by key operation (JOG)

(1) Before entering the JOG screen

The operating interface of JOG is located at F23.00, the servo drive should be disconnected and enabled at this time. First press the key to find F23.00, press SET to enter the JOG interface, the display will show the point speed setting value (F05.02), each parameter is the factory parameters, the display is as follows: , the last one will flash, indicating that it can be modified, press SHIFT to move, press UP and DOWN to add or subtract numbers.

(2) After entering the Jog (JOG) screen

After entering the JOG screen, after pressing the SET button once, the numbers will no longer be flashing, indicating that they can no longer be modified, at which point the pointing function has been activated.

Press and hold the UP key, the motor will rotate at the speed value displayed in the first line; press and hold the DOWN key, the motor will rotate at the speed value displayed in the first line;when the UP key or DOWN key is no longer pressed, the motor will stop rotating,but there is no pointing process at this time, that is, it is still in the speed mode operation state, only the command is 0. Exit Press the MODE key to exit the pointing process.

Chapter 5: Control functions

5.1 Position control mode

Summary.

Position control is performed according to the position command from the host computer (e.g., pulse input, communication give) or the servo's internal multi-stage position command, and the basic functions during position control are explained below.

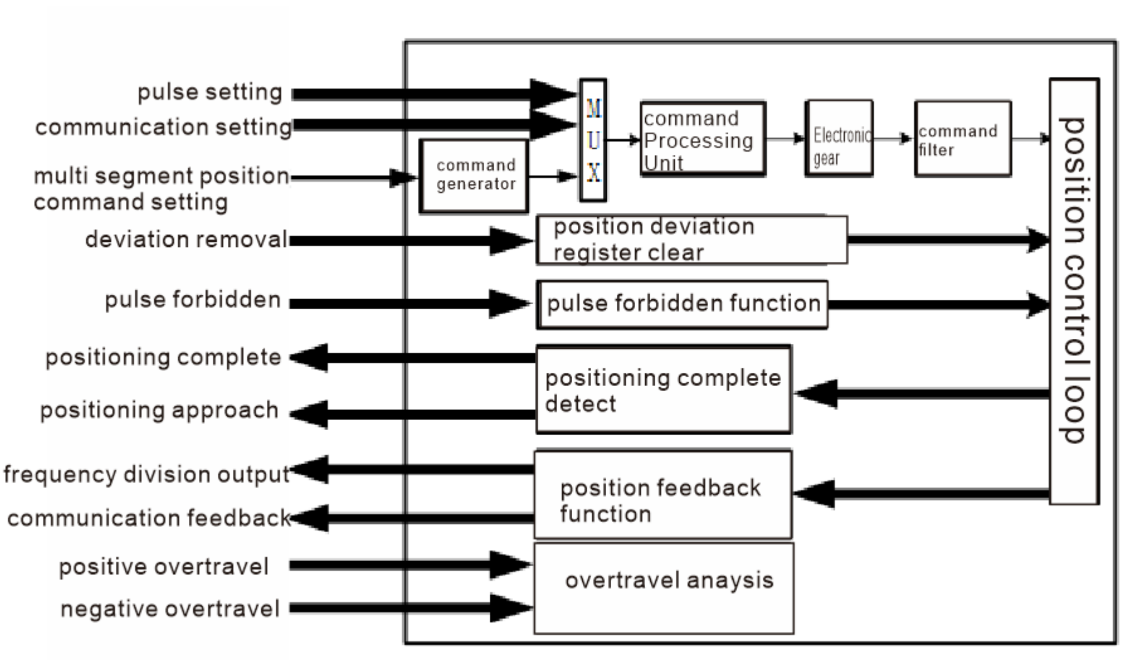


chart0-1 Block diagram of the basic functions of position control

Functional description:

1 Position command processing unit.

The position command processing unit determines the command source and counts the commands, giving the command units required for the current control in real time. There are three sources of position instructions (F01.05): 0-pulse instructions; 1-step amount given; 2-internal multi-stage position instructions.

Among them, when the source of the position command is a pulse command, the pulse command is divided into six forms (F01.07 and F01.08): 0- Direction + pulse, positive logic; 1- Direction + pulse, negative logic; 2-A(Pulse)+B(sign) two-phase quadrature pulse, quadruple frequency, positive logic; 3-A+B two-phase quadrature pulse, quadruple frequency, negative logic; 4-CW+CCW, positive logic; 5-CW+CCW, negative logic. logic; 5-CW+CCW, negative logic. The user needs to set F01.05 and F01.07 or F01.08 according to the actual command form of the upper unit, and determine whether the wiring method is differential input or open collector (OC) input according to the signal mode of the upper unit. Note: The pulse control function is only supported by the pulse-only or full-featured models.

When the command source selects the step amount to be given, the position amount to be stepped is set by F01.23, and the drive internally interpolates at a very low speed to go through the specified displacement amount. Can be used for manual commissioning.

When the instruction source selects the internal multi-segment position instruction, the 16-segment displacement, running speed and acceleration/deceleration are set by the F10 group function code, and the drive internally performs linear interpolation according to the set parameters to complete the specified trajectory.

Associated parameters.

<table>
<tr><td>F01</td><td>05</td><td>Location command source</td><td>0-Pulse command
1 - Step amount given
2 - Internal multi-segment position command
3 - Reservations</td></tr>
<tr><td rowspan="2">F01</td><td>07</td><td>Pulse String Pattern</td><td rowspan="2">0-Direction + Pulse, positive logic. (default value)
1-Direction + Pulse, Negative Logic
2 - Phase A (Pulse) + Phase B (Sign) quadrature pulse 4x frequency, positive logic (A ahead of B is positive)
3 - Phase A (Pulse) + Phase B (Sign) Quadrature pulse 4x frequency, negative logic (B over A is positive)
4-CW+CCW, positive logic
5-CW+CCW, negative logic</td></tr>
<tr><td>08</td><td>High-speed burst pattern</td></tr>
<tr><td>F01</td><td>23</td><td>Position stepping amount setting</td><td>-9999 to 9999 command units</td></tr>
</table>

When F01.01 is set to 9 (EtherCAT control), the position command is given by the upper controller via communication (EtherCAT), please refer to the corresponding bus control chapter (e.g. chapter 8 EtherCAT bus description) and the standard technical documentation of the communication protocol used.

2 Electronic gears :

The main function of the electronic gear is to multiply the input position command given by the host computer by a certain fractional ratio to obtain the pulse command in units of the minimum resolution of the encoder required by the position loop controller.

When F01.09 is not 0, position control command = encoder resolution * input command / F01.09 (this parameter is not valid when the motor type is selected as linear motor, it can only be set with electronic gear ratio numerator and denominator, see below for calculation method) ;

When F01.09 is 0, position control command = electronic gear ratio numerator * input command / electronic gear ratio denominator.

The current electronic gear ratio is selected via the DI function GEAR_SEL1 at.

GEAR_SEL1 invalid: Electronic gear ratio 1

GEAR_SEL1 is valid: Electronic gear ratio 2.

Associated parameters.

F01	09	Number of unit instructions required for one revolution of the motor (32 bits)	0Uint/Turn ~ 1073741824 Uint/Turn
F04	00	First electron gear molecule (32 bits)	1 to 1073741824
F04	02	Electronic gear denominator (32 bits)	1 to 1073741824
F04	04	Second electron gear molecule (32 bits)	1 to 1073741824

The electronic gear ratio has a wide range of numerator and denominator settings, but when the ratio of the electronic gear ratio exceeds a certain range, an electronic gear setting error E.38 is reported. The electronic gear ratio must satisfy the following range.

Encoder resolution / 10000000 ≤ numerator / denominator ≤ encoder resolution / 2.5

When communication control is enabled, the electronic gear ratio is selected by the parameter F09.13 (Electronic gear ratio selection for communication control) whether the internal electronic gear ratio (above parameters) or the communication-specific electronic gear ratio parameters are used (e.g. for EtherCAT communication control, the electronic gear ratio can be set with the parameters 6091.01h, 6091.02h).

3 Position command filtering.

The position command filter function must be used to smooth the command after the electronic gear calculation. There are two types of built-in position command filters: a low-pass smoothing filter (IIR) , and an average filter (FIR). The larger the filtering time, the better the filtering effect, but the greater the delay in the command response.

Associated parameters.

F02	40	Position command smoothing filtering	0.0ms～6553.5ms
F02	41	Position command averaging filtering	0.0ms ~ 512.0s
F02	42	Position command average filtering 2	0.0ms to 512.0ms

4 Pulse divider output function.

This function only exists in the pulse model, the pulse frequency division output function can convert the position of motor rotation into AB phase orthogonal pulse output to the upper computer, the upper computer can carry out position closed loop control or position monitoring according to this feedback. And the motor can output one Z signal pulse for each rotation of the motor. The pulse output source, resolution, phase sequence logic, and Z-signal logic can be set by function code.

Associated parameters.

F01	11	Number of pulses output in one revolution of the motor (32 bits)	16PPR ~ 1073741824PPR (Number of corresponding lines by incremental photoelectric encoder)
F01	13	Definition of the positive direction of the pulse output	0:velocity is positive, OA overtakes OB 1:Negative velocity, OA ahead of OB
F01	14	Pulse output OUTZ polarity	0-Z pulses are high when they arrive 1-Z pulse is low when it arrives
F01	15	Pulse output function selection	0-Encoder feedback divider output 1 - Command synchronization output

5 Pulse deviation zeroing function

This function is used to set the clear condition under which the accumulated pulse deviation in the internal position controller can be cleared to zero.

Associated parameters.

F04	10	Position deviation clearance function	0: Servo OFF and clear position deviation pulse in case of fault 1: Position deviation pulse is cleared only in the event of a fault 2:Cleared when the servo is OFF and when a fault occurs, and when the DI function (PERR_CLR) is active 3:Clear only by DI function (PERR_CLR)

6 Pulse input disable function

Use this function to ignore the pulse input signal when required, and the count of the position command input counter is forced to stop.

Associated parameters.

F04	12	Pulse disable input setting	0:0.5ms 2 consecutive times in unison 1:0.5ms 3 consecutive times consistent 2:1ms 3 consecutive times consistent 3:2ms 3 times in a row in unison

7 Positioning completion detection function

The positioning completion and positioning approach are judged by detecting whether the position deviation is within the set range, and the corresponding DO signals COIN and NEAR are output according to the setting (first configure the DO function to the corresponding output pins).

Associated parameters.

F04	61	Positioning the completed range	1P ~ 65535P
F04	62	Positioning complete Output Settings	0: Absolute value of position deviation is less than the positioning completion range 1: The absolute value of position deviation is less than the positioning completion range and the position command is 0 2:The absolute value of position deviation is less than the positioning completion range and the filtered position command is 0 3:When condition 0 and the zero speed signal is valid at the same time 4:When condition 1 and the zero speed signal is valid at the same time 5:Condition 2, when the zero speed signal is valid at the same time
F04	63	Positioning complete Hold time	0 to 65535ms (0 - Positioning completion signal is always output as long as the condition is met)
F04	64	Positioning proximity range	1P ~ 65535P

5.2 Speed control mode

Summary.

Speed control is performed according to the speed command from the host computer (e.g. analog input) or the servo's internal speed command, and the following explains the basic functions during speed control

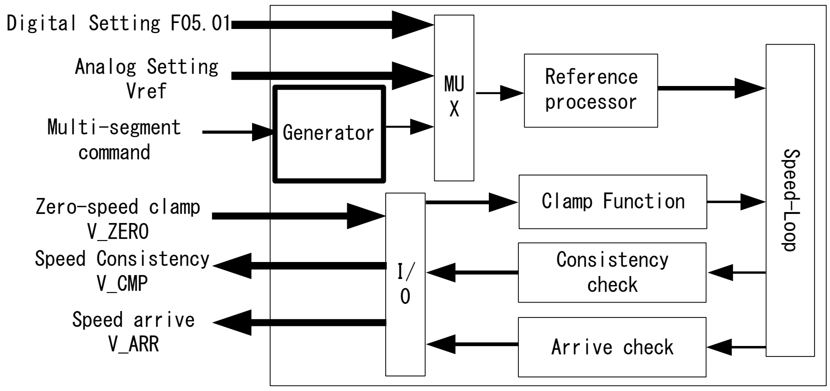


chart0-2 Block diagram of the basic functions of speed control

Functional description.

1 Speed command processing

When the speed source F05.00 is equal to 1, the analog input channel of Vref (default AI1) is first set through F07.07 and F07.17. The analog speed processing section converts the analog voltage given by the host computer to A/D, and the converted digital result will correspond to the specific speed command value according to the set correspondence. At the same time, a digital filter can be set to prevent interference and reduce noise.

When F05.00 equals 0, the speed command give value is set via F05.01.

When F05.00 equals 2, F05.33 to F05.65 set 16-segment internal speed command value and acceleration/deceleration time, and also need to configure DI functions 8, 9, 10 and 11 for multi-segment speed selection.

Associated parameters.

F05	00	Speed command source	0:Digital Setting (F05.01) 1:Vref (default AI1) 2:Multi-segment command 1 to 16 switching 3:Vref and multi-segment command 2 to 16 switching 4:Communication setting 5:Vref + digital setting 6:Multi-segment command 1 to 16 switching + digital setting
F05	01	Speed command setpoint	-9000rpm～9000rpm
F07	00	AI1 minimum input	-10.00V to 10.00V
F07	01	AI1 minimum value corresponds to the set value	-100.0% to 100.0% (100% speed corresponds to the speed set in F05.14, 100% torque corresponds to the torque set in F05.15)
F07	02	AI1 maximum input	-10.00V to 10.00V

F07	03	AI1 maximum value corresponds to the set value	-100.0% to 100.0% (100% speed corresponds to the speed set in F05.14, 100% torque corresponds to the torque set in F05.15)
F07	04	AI1 Zero Point Trim	-500mV～500mV
F07	05	AI1 deadband setting	0.0 to 20.0%
F07	06	AI1 input filtering time	0.0ms～6553.5ms
F07	07	AI1 function selection	0:Vref, 1:Tref, 2:VLMT, 3:TLMTP, 4:TLMTN, 5:TFFD
F07	08	Reserved parameters	
F07	09	Reserved parameters	
F07	10	AI2 minimum input	-10.00V to 10.00V
F07	11	AI2 minimum value corresponds to the set value	-100.0% to 100.0% (100% speed corresponds to the speed set in F05.14, 100% torque corresponds to the torque set in F05.15)
F07	12	AI2 maximum input	-10.00V to 10.00V
F07	13	AI2 maximum value corresponds to the set value	-100.0% to 100.0% (100% speed corresponds to the speed set in F05.14, 100% torque corresponds to the torque set in F05.15)
F07	14	AI2 zero point trim	-500mV～500mV
F07	15	AI2 deadband setting	0.0 to 20.0%
F07	16	AI2 input filtering time	0.0ms～6553.5ms
F07	17	AI2 Function Selection	0:Vref, 1:Tref, 2:VLMT, 3:TLMTP, 4:TLMTN, 5:TFFD

2 Zero speed clamp function

The speed command can be forced to 0 by using the DI function ZERO_SPD, and the setting parameter F05.21 determines whether it is necessary to switch to position control mode for locking. Associated parameters.

F05	21	Zero speed clamp function	0:Invalid 1: Speed command forced to 0 when ZERO_SPD is active 2: The speed command is forced to 0 when ZERO_SPD is active , when the motor is actually Switching to position control when speed falls below F05.22, locking at current position

F05	22	Zero Speed Clamping Threshold	0rpm to 1000rpm

3 Speed consistency detection function

When the speed command before acceleration and deceleration processing and the motor speed feedback are within the range specified in F05.70, the output speed is consistent with the V_CMP signal, and there is a 10rpm lag in the actual detection.

F05	70	Speed-consistent signal width	10rpm to 1000rpm

4 Speed arrival function

The output speed reaches the V_ARR signal when the actual speed reaches above the specified speed value, with a 10rpm lag in actual detection.
Associated parameters.

F05	71	Speed reaches specified value	10rpm to 1000rpm

5 Speed acceleration and deceleration function

There are four sets of acceleration and deceleration times that can be set, with the first set of acceleration and deceleration speeds being used by default. When the internal multi-step speed command function is used, the first to fourth group of acceleration and deceleration times can be selected. When the acceleration/deceleration time is set to 10ms, it means that the acceleration time from 0 to 1000rpm or deceleration time from 1000rpm to 0 is 10ms.

F05	12	Acceleration time 1	0 ms to 65535ms / 1000rpm
	13	Deceleration time 1	0 ms to 65535ms / 1000rpm
	14	Acceleration time 2	0 ms to 65535ms/ 1000rpm
	15	Deceleration time 2	0 ms to 65535ms / 1000rpm
	16	Acceleration time 3	0 ms to 65535ms / 1000rpm
	17	Deceleration time 3	0 ms to 65535ms / 1000rpm
	18	Accelerated time 4	0 ms to 65535ms/ 1000rpm
	19	Deceleration time 4	0 ms to 65535ms / 1000rpm

5.3 Torque control mode

Summary.

The torque output from the servo motor is controlled according to the given torque command (analog or internal torque setting), and a speed limiting function must be added for practical applications to prevent flying due to too small a load.

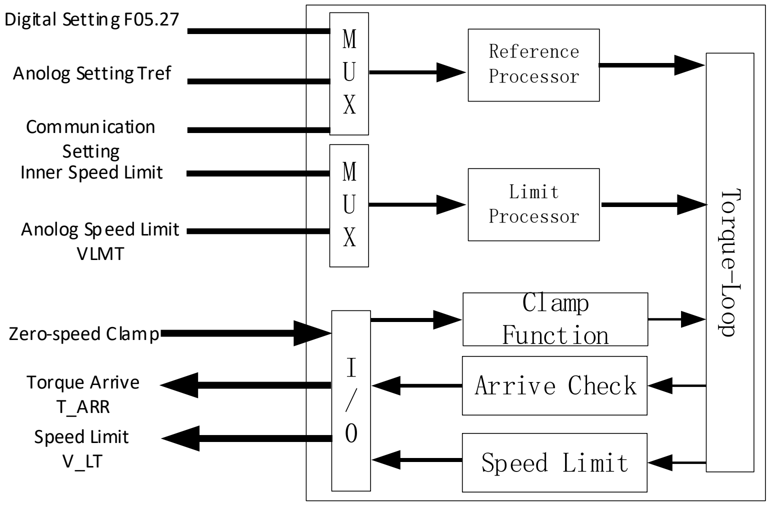


chart0-3 Block diagram of the basic torque command

Functional description.

1 Torque command processing

When F05.24 is equal to 1, the analog input channel of the fixed Tref is first set by F07.07 and F07.17. The analog torque command processing section converts the analog voltage given by the upper computer to A/D, and the converted digital result corresponds to the specific torque command value according to the set correspondence. At the same time, to prevent interference and reduce noise, a digital filter can be set for filtering.

When F05.24 is equal to 0, the torque command is set digitally via F05.27; when F05.24 is equal to 2, the DI function CMD_SEL allows switching between digital and analog settings.

Associated parameters.

F05	24	Torque command source	0: Digital Setting (F05.27) 1: Tref 2: Digital setting, TREF switching (CMD_SEL) 3: Communication setting 4: Tref+ digital setting
F05	27	Torque command keypad setpoint	-300.0% to 300.0% (based on rated motor torque)

In this case, the analog-related parameters are the same as in the case of speed control.

2 Speed limitation during torque control

During normal torque control, the speed control circuit is disconnected, so the speed must be limited to prevent accidents. The speed limiting function is to limit the motor rotation speed to the set range. When the motor speed exceeds the speed limit value, the actual acting torque command is no longer equal to the torque command, but to the output of the speed limit regulator. The speed limit value can be set internally via F05.29, F05.30, or via the analog input VLMT. The final speed limit must not exceed the maximum speed of the motor.

Associated parameters.

F05	28	Speed during torque control Limiting source selection	0 - Forward and reverse internal speed limits F05.29, F05.30 1-VLMT: Use AI input value as speed limit value
	29	Internal positive speed limit	0rpm ~ 9000rpm
	30	Internal negative speed limit	0rpm ~ 9000rpm

Note: The parameters related to the analog input settings are the same as in the case of speed control.

Capter 6: Application Features

6.1 Motion control functions

6.1.1 Internal multi-segment position command

Summary.

The position control mode also allows the selection of multiple position commands within the drive, allowing the user to easily set the total number of command segments, the operating speed, and the acceleration and deceleration speeds.

Functional description.

The multi-stage position command, like the external pulse command, can receive a deviation clearing signal by the electronic gear and position command filter, and output a positioning completion signal after positioning is completed, and can also be configured with a pulse divider output.

For example, if the number of encoder pulses for a motor rotation-turn is PPR, and the user expects the motor to rotate one revolution when giving UPR user command units, then the electronic gear ratio to be set is: PPR/UPR.

The multi-segment position command can be configured with up to 16 different segments, each with a different running speed and acceleration/deceleration. The user can set up sequential execution, or random segment execution via DI or communication. Relative or absolute instructions can be configured, i.e. whether each segment is an increment relative to the current position or an absolute value relative to the zero point.

For the sequential execution method, the start segment number and the end segment number can be set, so that it can be executed sequentially from the start segment until the end segment; single run or loop run can be selected: in single run, after the end segment is executed, it will not be run again; in loop run, after the end segment is executed, it will be executed from the start segment again until the user terminates the run. In addition, for sequential execution, the waiting time between segments can be set.

The following table explains the relationship between the validity of the DI function and the selection of the multi-segment location (ON: means the corresponding DI function is valid, OFF: means the corresponding DI function is invalid).

Execute the Nth instruction	DI function 8/SEL1	DI function 9/SEL2	DI function 10/SEL3	DI function 11/SEL4
1	OFF	OFF	OFF	OFF
2	ON	OFF	OFF	OFF
3	OFF	ON	OFF	OFF
4	ON	ON	OFF	OFF
5	OFF	OFF	ON	OFF
6	ON	OFF	ON	OFF
7	OFF	ON	ON	OFF
8	ON	ON	ON	OFF
9	OFF	OFF	OFF	ON
10	ON	OFF	OFF	ON
11	OFF	ON	OFF	ON
12	ON	ON	OFF	ON
13	OFF	OFF	ON	ON
14	ON	OFF	ON	ON
15	OFF	ON	ON	ON
16	ON	ON	ON	ON

Note: When using the multi-segment position command, the internal multi-segment position enable signal (DI function 5) needs to be input via DI after the servo ON to give the position command.

The flow of the multi-segment position command is shown in the following diagram:

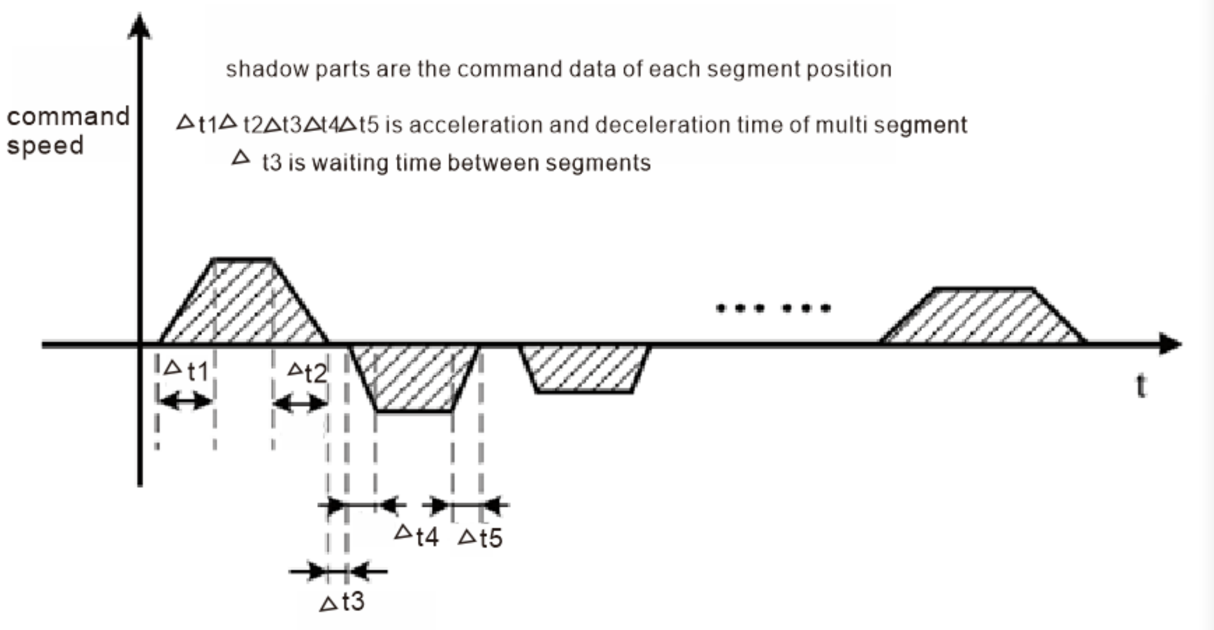


chart0-1 Schematic diagram of multi-segment position command execution

Associated parameters

parameters		name (of a thing)	Parameter Description
F04	46	Multi-segment position execution method	0: Single operation 1: Cyclic operation 2:DI terminal switching operation 3:Communication switching operation 4:Single continuous operation 5:Cyclic continuous operation
F04	47	Multi-segment position command type	0:Relative command 1:Absolute command
F04	48	Multi-segment position internal control of waiting time	0~65535ms
F04	49	Multi-segment location starting segment serial number	1 ~ (F08-02)
F04	50	Multi-segment location end segment serial number	(F08-01)~16
F04	51	Multi-stage position pause and restart Treatment of remaining segments	0-Run the remaining segments 1-Run from the starting segment again
F10	00	Segment 1 displacement (32 bits)	-1073741824~1073741824
F10	01	Segment 1 displacement (high 16 bits)	
F10	02	Paragraph 1 maximum speed (32 bits)	1 to 80,000,000
F10	03	Segment 1 maximum speed (high 16 bits)	
F10	04	Paragraph 1 acceleration multiplier	0% - 300%
F10	05	Paragraph 1 deceleration multiplier	0% - 300%
...	...	...	...
F10	90	Paragraph 16 displacement (32 bits)	-1073741824~1073741824
F10	91	Segment 16 displacement (high 16 bits)	
F10	92	Paragraph 16 maximum speed (32 bits)	1 to 80,000,000
F10	93	Paragraph 16 maximum speed (high 16 bits)	
F10	94	Paragraph 16 acceleration multiplier	0% - 300%
F10	95	Paragraph 16 deceleration multiplier	0% - 300%

F10.00 to F10.05 are the parameters for the number of position command pulses, running speed, acceleration and deceleration time and wait time after completion for the first segment, and similar for the remaining segments.

Related DI Function Description.

DI function 5	Internal multi-segment position command enable signal, must be configured
DI function 8	SEL1-SEL4, selects the number of segments of the multi-segment position command to be executed.
DI function 9	
DI function 10	
DI function 11	

6.1.2 Intermediate decision length

Summary.

The interrupt length is also an internally generated position command function. In position control mode, a position instruction being executed (whether pulse given, communication given, or multi-segment position instruction) can be interrupted at any moment to go to a user-specified segment of the position instruction, see the figure below.

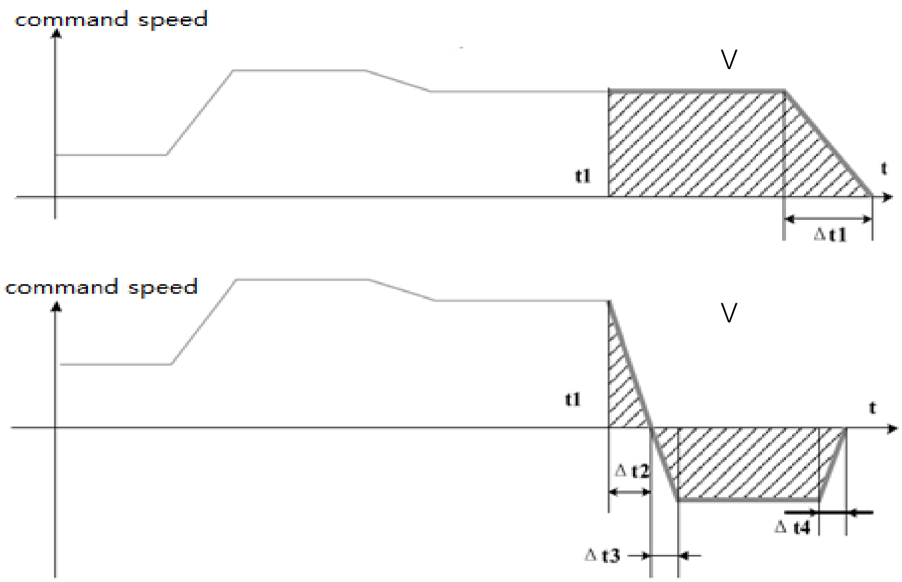


chart0-2 Schematic diagram of the execution of the interrupt-determined-length instruction

Functional description.

Before the moment t1 of the figure, the motor is executing the position command given by the upper computer, the DI signal at the moment t1 triggers the mid-break length, and the thick line indicates that the mid-break length command is being executed. The sum of the areas shaded in the figure is the length of the position command for the mid-break length.

Δt1, Δt2, Δt3, and Δt4 are the times of the mid-determined long acceleration process or deceleration process.

To use the mid-break length, the following parameters and DI input functions need to be configured, and two additional DO output functions are available for monitoring the mid-break length process. The number of position commands and acceleration and deceleration times for the interrupted length are specified by the parameters F04.66, F04.68, F04.70, and F04.71.

*Note: If the current speed V1 * Δt1 / 2 + current position deviation < the interrupted displacement, the motion waveform will be as shown in the upper half of the diagram; otherwise, the motion waveform will be as shown in the lower half of the diagram, and the motor will decelerate to 0 and then reverse. When the set command direction is opposite to the current motion direction, the motor will also move in the reverse direction.*

Associated parameters.

F04	52	intermediate decision length Execution settings	0:Disable the interrupt execution function; 1:Enable, interrupt on the rising edge of DI signal (independent of DI logic setting), and automatically release the interrupt lock state after completion; 2:Enable, interrupt on the rising edge of DI signal (independent of DI logic setting), and release the interrupt lock state through DI signal XINT_ULK after completion; 3:Enable, interrupt on the falling edge of DI signal, and automatically release the interrupt lock state after completion 4:Enable, interrupt on the falling edge of the DI signal, and unlock the interrupt state by DI signal XINT_ULK after completion
F04	53	Interrupting long electrons Gear Selection	0: Do not follow gear ratio adjustment, interrupt displacement is set to command unit 1: Follow gear ratio adjustment, interrupt displacement is set to encoder unit
F04	54	Interrupting long commands Directional Options	0: follows the current running direction 1: determined by the sign of the command value
F04	54	Interrupting long commands Directional Options	0: follows the current running direction 1: determined by the sign of the command value
F04	66	intermediate decisive long position	-1073741824~1073741824

		Shift amount (32 bits)	
F04	68	intermediate decision length Maximum speed	1 to 6000 rpm
F04	70	intermediate decision length acceleration time	0 - 1000ms
F04	71	intermediate decision length Deceleration time	0 - 1000ms
F06	01～05	DI1 to DI5 Function Definition	A digital input must be configured to function as an interrupt execution trigger signal 34 (DI1 to DI5 can all be configured as interrupt execution trigger signals)

Description of the relevant digital input and output functions.

DI function 34	Interrupting a long execution trigger signal
DI function 26	Unlock mid-break length (must be set when F04.52 is set to 2 or 4)
DI function 27	Prohibit the determination of the length in execution, optional
DO function 14	Output monitoring, mid-break length completion, optional
DO function 18	Output monitoring, in asserting that a long is being executed, optional

6.1.3 Return to the origin

Summary.

The servo driver has an internal home return function and supports various home return methods. The servo motor can be used independently to search for the home point, or it can be used in conjunction with the host computer to achieve home point return.

For the case where the limit position is the origin, see Figure 4.6 below, and then, depending on the need, you can choose whether or not to find the Z-pulse signal, which enables a variety of different ways to search for the origin.

In the case of a home position sensor, see Figure 4.7 below, there are several configurations to choose from, and the end result can vary, as the use of a rising or falling edge for the home position sensor signal can lead to a different home position being found. In addition, it is important to check whether the Z-pulse signal is used and the direction of the search for the Z-pulse signal.

When using Z-pulses, different directions of finding the Z-pulse will find different home positions, see Figure 4.8 below.

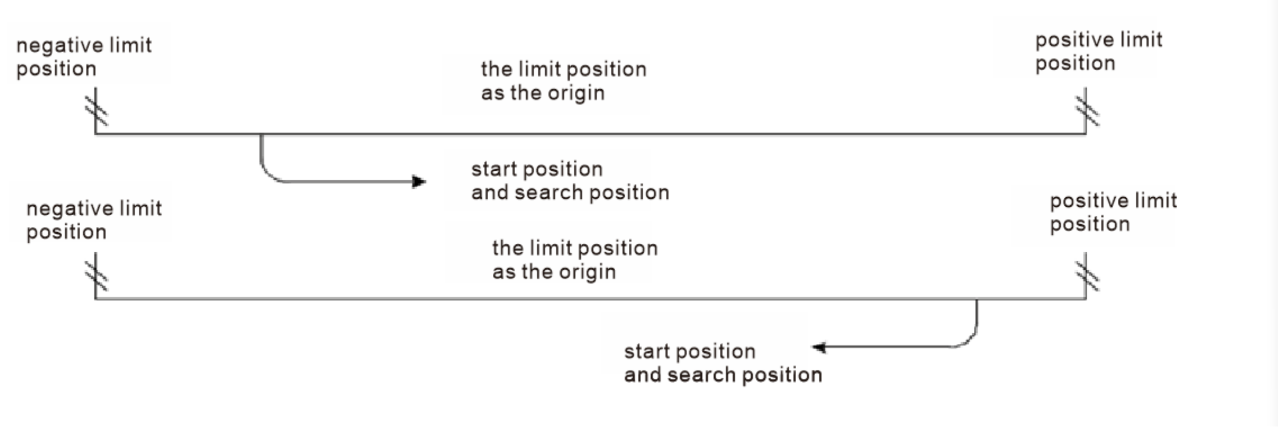


chart0-3 The case where the limit position is the origin

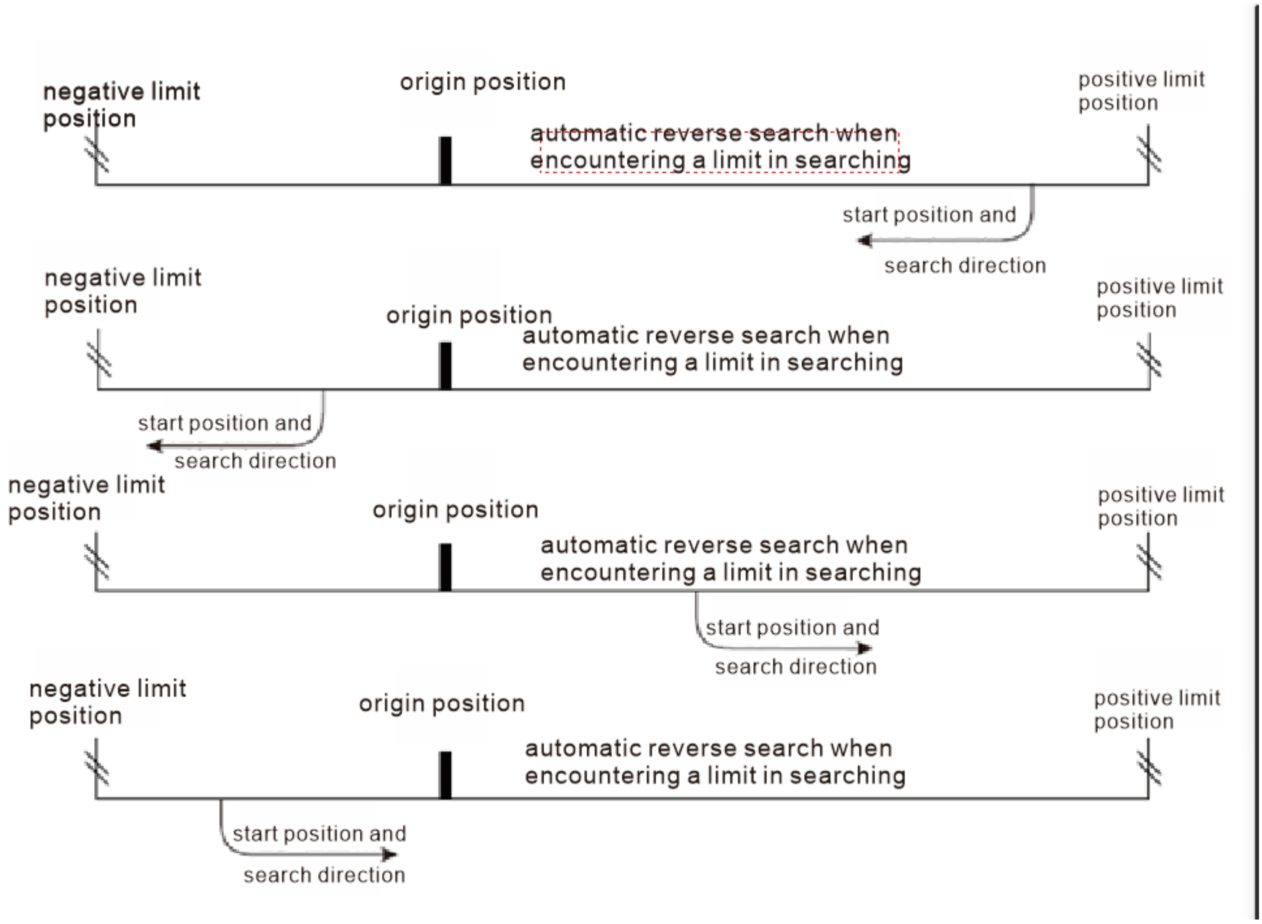


chart0-4 Case with home position sensor

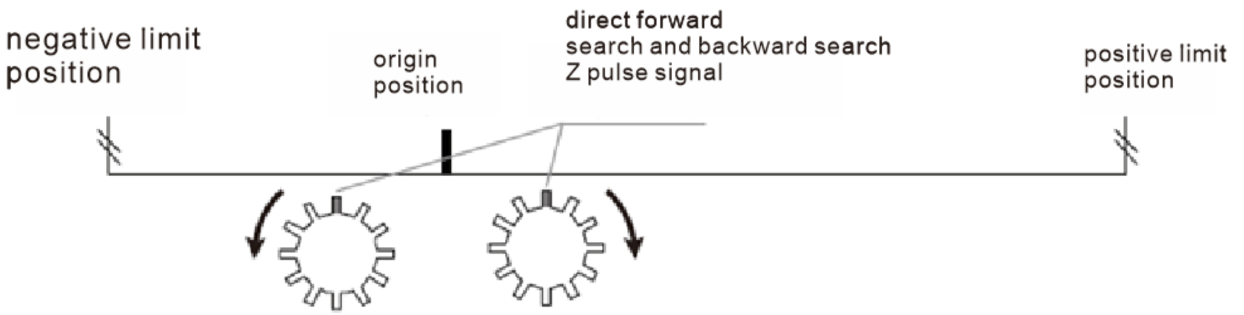


chart0-5 Backward Search or Forward Search Z Pulse Signal

Functional description.

To use the home return function, set the parameters shown in Table 1 and the DIDO function shown in Table 2. Use F11.00 to configure the start method of home return, and use F11.01 to set the way to search for the home position. When searching the origin, the limit position may be encountered, and the alarm stop can be selected when the limit position is encountered, or the automatic direction search can be selected, use F11.02 to configure how the pole position is handled. Use F11.04 and F11.05 to set the high speed search speed and low speed search speed, and use F11.06 to set the acceleration and deceleration time during the search. In addition, there is a time limit for the origin search process, use F11.07 to set the upper time limit, after this time the origin return is not completed will report A.94.

Associated parameters.

group number	name (of a thing)	instructions
F11.00	Origin return start method	0:off 1:Start by DI function STHOME 2:Keyboard start 3:Communication activation 4:Start immediately after powering on the first servo ON
F11.01	Return to origin model	0:Positive rotation search origin, with positive limit as origin 1:Invert the search origin with the negative limit as the origin 2:Forward rotation search origin, using HOME_IN signal OFF→ON as the origin 3:Reverse the search origin, using the HOME_IN signal OFF→ON as the origin 4:Forward search origin, using HOME_IN signal ON→OFF as origin

		5:Reverse the search origin, using the HOME_IN signal ON→OFF as the origin 6:Positive rotation looks directly for the nearest Z signal as the origin 7:Invert to find the nearest Z signal directly as the origin 8:Directly use the current position as the origin
F11.02	Return of the origin to the time limit position and Z signal settings	0: automatically reverses when it encounters a limit, returning to find the Z signal. 1: automatically reverses when it encounters a limit and looks directly forward for the Z signal. 2: Automatic reversal of limits encountered, without finding the Z signal. 3: Stops and alarms when a limit is encountered and returns to find the Z signal. 4: encounter a limit stop and alarm, look directly forward for the Z signal. 5: Stops and alarms when a limit is encountered, without looking for the Z signal. Notes: For the handling of encountered limits, such as for regression mode 0 to 1, even if Here it is set to 3, 4 or 5 and does not alarm or stop. For finding the Z signal, if the regression mode is 0 to 1, it is in the limit of encounter after the bit signal; as for regression modes 2 to 5, it is after encountering After the HOME_IN signal.
F11.04	High Speed Search Velocity of the origin	After the home return process is started, the search for the home position starts at this speed unless a deceleration signal or home position signal is already present at the start.
F11.05	Low-speed search Velocity of the origin	When searching for the origin, switch to low speed search after hitting a deceleration point, or after hitting the origin position.
F11.06	When searching for the origin of the Acceleration and deceleration time	Set the acceleration and deceleration time in ms for the start and stop of the search home
F11.07	return to the origin process Time limit value	Set a limit time for the origin return process, after which time the origin is not searched, the origin search is stopped and alarm A96

F11.08	Origin Coordinate Offset	Once the home position is finally found, the absolute position is usually cleared to 0. You can also set the absolute position counter to the value of this parameter
F11.10	mechanical origin position offset	After finally finding the home position, you can again move the section of displacement set by this parameter

Related DIDO functions.

DI function 29	Starts the origin regression process, must be configured, can be configured to any DI port
DI function 28	Home position sensor access signal, mandatory for F11.02 selections 2, 3, 4, 5, can be configured to any DI port
D0 function 17	Mark origin return complete when valid, configurable to any DO port

6.2 Power down protection function

The protection functions of the shutdown include instantaneous power failure protection, fault shutdown protection and over-travel shutdown protection, which are not turned on by default. Users can turn on the corresponding protection function according to their is needs.

6.2.1 Instantaneous power failure protection

When the machine is in normal operation, if a sudden power failure occurs in the factory, after the power failure protection function is turned on, the servo can use the remaining internal power to stop the motor quickly, so that the motor does not stop freely and cause a crash to the mechanism. Instantaneous power failure protection function related parameters F08.00, F08.01.

F08.00	stop instantly without stopping Protective switches	Setting range	factory value	unit	Mode of entry into force	Related models		
		0 ~ 1	0	1	Effective immediately	P	S	T

When this protection function is enabled, if the power supply is restored immediately after a momentary power failure, the previous state before the mains power failure can be restored immediately. 0: not on; 1: on.

F08.01	stop instantly without stopping	Setting range	factory value	unit	Mode of entry into force	Related models

	Deceleration time	0 to 10000	20	1ms	Effective immediately	P	S	T

After turning on the instantaneous power failure protection, use this power failure deceleration time when stopping. The range is 0ms ~ 10000ms/1000rpm This parameter can be set according to the actual needs of the customer, and it is generally recommended that this parameter be set within 30.

6.2.2 Fault shutdown protection

When the drive is running normally, if a sudden failure occurs, after setting the failure stop method, the servo motor can be stopped down quickly to avoid free stopping which will cause crashing the mechanism.

F08.03	No2. Failure Shutdown method	Setting range	factory value	unit	Mode of entry into force	Related models		
		0 to 2	0	1	Downtime in effect	P	S	T

0: Free stop, stay free. After a fault, the motor current shuts off and runs free until it stops.
1: Zero speed stop and remain free. After a Class 2 fault occurs, the motor current continues to be output for a period of time until the motor stops completely , after which the motor remains free.
2: Stops with emergency stop torque and remains free. After a type II fault occurs, the emergency stop is made with the torque set in parameter F08.08. After the stop is completed, the motor remains free.

F08.08	emergency stop torque	Setting range	factory value	unit	Mode of entry into force	Related models		
		0 to 5000	1000	0.1%	Effective immediately	P	S	T

0.0% ~ 300.0% (based on rated motor torque)

6.2.3 Over-travel shutdown protection

The over-travel stop method is selected to meet the stopping requirements of different occasions. If a quick stop is required, it can be set to zero speed stop or emergency stop torque stop.

<table>
<tr><td rowspan="2">F08.04</td><td rowspan="2">Overtravel input setting</td><td>Setting range</td><td>factory value</td><td>unit</td><td>Mode of entry into force</td><td colspan="3">Related models</td></tr>
<tr><td>0 ~ 1</td><td>1</td><td>--</td><td>Downtime in effect</td><td>P</td><td>S</td><td>T</td></tr>
</table>

0: DI function 15 (P_OT) positive drive disable, DI function 16 (N_OT) negative drive disable

1: Invalid

<table>
<tr><td rowspan="2">F08.05</td><td rowspan="2">on overtravel stopping method</td><td>Setting range</td><td>factory value</td><td>unit</td><td>Mode of entry into force</td><td colspan="3">Related models</td></tr>
<tr><td>0 to 2</td><td>0</td><td>--</td><td>Downtime in effect</td><td>P</td><td>S</td><td>T</td></tr>
</table>

0: Free stop and maintain zero speed. (Motor shaft locked after valid overtravel)

1: Zero speed stop, maintain zero speed. (Motor shaft locked after valid overtravel)

2: Stops with emergency stop torque and remains free. (Positive overtravel active, positive locked, negative remains free; negative overtravel active, negative locked, positive remains free)

6.2.4 Shutdown protection deceleration time

When the stopping mode is free stop, the motor stops inertially, and the stopping time is independent of the deceleration time setting.

When the stop mode is zero speed stop or emergency stop torque stop, the deceleration time is controlled by F05.23 for non-communication control mode command and by 6085h for EtherCAT communication control.

6.3 Soft limit function

The soft limit function is to meet the needs of different occasions, turn on the soft limit function, when the motor runs beyond the set range, the drive will report an over-range warning, the motor stops running, thus playing a protective role.

Opening the soft limit process :

F08.04 is set to 0 to turn on the overtravel input setting; F08.05 selects the overtravel stop method.

The soft limit function is turned on by setting F08.34: 0: no soft limit detection; 1: soft limit detection starts as soon as power is applied; 2: soft limit detection is done only after the return to home position is completed.

F08.35 sets the value of the positive soft limit, F08.37 sets the value of the negative soft limit

<table>
<tr><td rowspan="2">F08.35</td><td rowspan="2">Positive soft limit
(32-bit)</td><td>Setting range</td><td>factory value</td><td>unit</td><td>Mode of entry into force</td><td colspan="3">Related models</td></tr>
<tr><td>2147483648 to 2147483647</td><td>2147483647</td><td>--</td><td>Downtime in effect</td><td>P</td><td>S</td><td>T</td></tr>
</table>

Positive soft limit, effective in position control, speed control and torque control modes. Set value command unit.

<table>
<tr><td rowspan="2">F08.37</td><td rowspan="2">Soft limit in negative direction
(32-bit)</td><td>Setting range</td><td>factory value</td><td>unit</td><td>Mode of entry into force</td><td colspan="3">Related models</td></tr>
<tr><td>-2147483648 to 2147483647</td><td>-2147483648</td><td>--</td><td>Downtime in effect</td><td>P</td><td>S</td><td>T</td></tr>
</table>

Negative soft limit, effective in position control, speed control and torque control modes. Set value command unit.

When the value of F24.15 (feedback position command unit) exceeds the range set by F08.35 and F08.37 during motor operation, an overtravel warning indication is reported, resulting in a shutdown for protection.

6.4 Absolute value system

The absolute value system, normally switched on, does not clear the motor encoder values after the drive's main and control power is dropped, and continues to be powered by the external battery, maintaining the encoder absolute position data. When re-powered, the drive is able to obtain the absolute motor position information from the encoder and display it in parameters F24.32 (absolute position encoder turns) and F24.34 (absolute position encoder single turn position).

Associated parameters:

<table>
<tr><td rowspan="2">F08.24</td><td rowspan="2">absolute value System settings</td><td>Setting range</td><td>factory value</td><td>unit</td><td>Mode of entry into force</td><td colspan="3">Related models</td></tr>
<tr><td>0 to 3</td><td>0</td><td>--</td><td>Power up</td><td>P</td><td>S</td><td>T</td></tr>
</table>

					again.			

0:Incremental system

1:Absolute value system

2: Absolute system (E. 14 faults need to be cleared manually)

3:- Absolute value system and overflow error reported.

When the absolute value system is required, you need to turn on the absolute value system by setting F08.24 to 1 or 2. When the absolute value system is switched on for the first time and the power is reapplied, fault E.14 (abnormal number of absolute encoder turns) is reported. In this case, set F23.06 to 3 to clear the number of turns, but if F08.24 is set to 2, a separate fault reset is required to reset the E14 fault. If the servo still reports the E.14 fault after performing the above operation, please check as follows.

① Check the encoder wiring for abnormalities and rewire it.

② Check whether the battery is normal, if the voltage is insufficient, please replace the battery.

③ Check if the encoder cable has 6 wires, if it is not 6 wires, this encoder cable may not be connected to the positive and negative battery terminals, replace the cable.

6.5 Pulse output function

This function exists only for pulse models. The driver has three main pulse outputs, A, B and Z. See the following table for details.

Signal Name	Output Pin No.	Name	Remarks
OUT_A		Encoder dividing pulse output A phase	When the motor rotates, the A-phase and B-phase pulses are output outward with a 90° phase difference.
/OUT_A			
OUT_B		Encoder dividing pulse output B phase	
/OUT_B			
OUT_Z		Encoder dividing pulse output Z-phase	The motor rotates one revolution and outputs one pulse.
/OUT_Z			

6.5.1 Pulse divider output

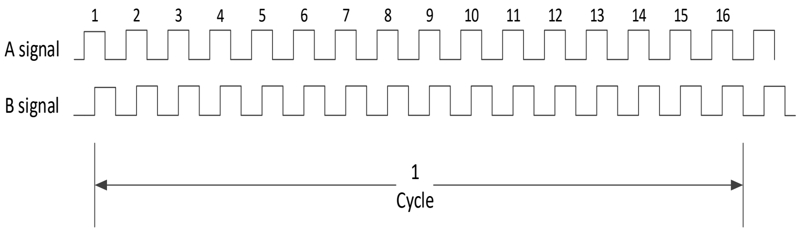
The parameters related to pulse divider output are F01.09 (number of pulses output in one revolution of the motor), F01.13 (definition of positive direction of pulse output), and the following are the details of the parameters.

Frequency division output pulse number is set by F01.09

F01.09	Number of pulses output in one revolution of the motor (32 bits)	Setting range	Factory value	Unit	Effective method	Related Models		
		16 ~ 1073741824	2500	1PPR	Power up again	P		

Set the number of OUTA or OUTB pulses output per 1 revolution of the motor. Range: 16PPR ～ 1073741824PPR (Calculate the number of corresponding lines by incremental photoelectric encoder)

Output example: When F01.09 = 16, the motor rotates one revolution and 16 pulses are output from phase A and phase B respectively, as shown in the figure below.



(2) The positive direction of the crossover pulse output is set by F01.13

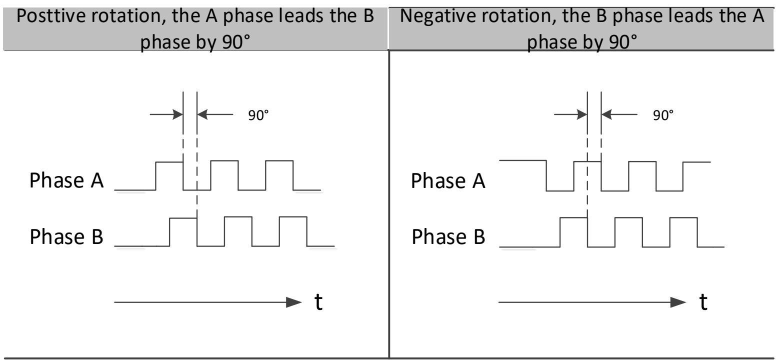
F01.13	Pulse output Definition of positive direction	Setting range	Factory value	Unit	Effective method	Related Models		
		0 ~ 1	0	--	Power up again	P	S	T

Sets the phase sequence logic for the pulse output function.

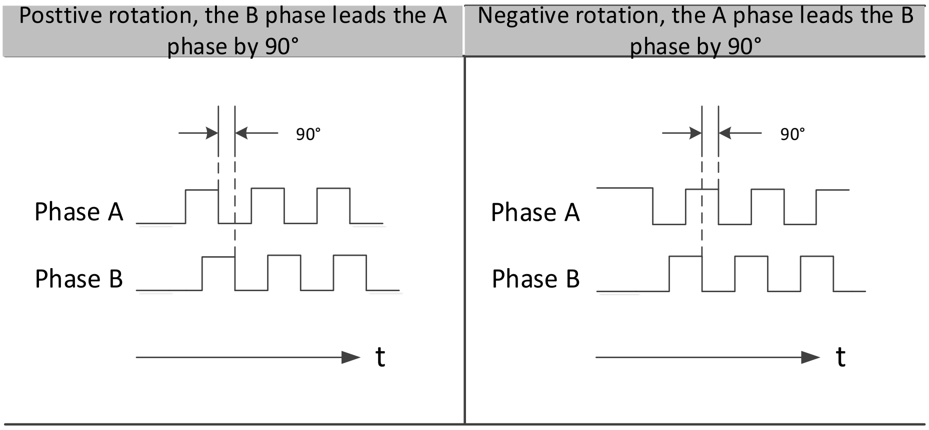
0: when the speed is positive, OA overtakes OB.

1:When the velocity is negative, OA overtakes OB.

① When F01.13 = 0, the phase relationship of A/B pulse output is as follows.

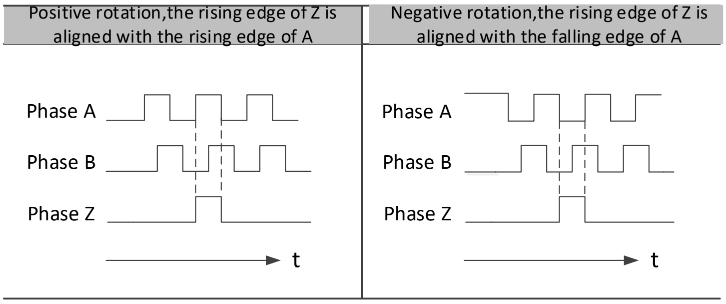


② When F01.13 = 1, the phase relationship of A/B pulse output is as follows.



6.5.2 Z signal output

By default, the Z-phase output pulse is shown below



F01.14 can set whether the Z-phase pulse is high or low when it arrives, the default is high; F06.59 can set the width of the Z-phase pulse when it arrives, the default is 0, the width is the same as the width of A.

6.5.3 Pulse synchronization output function

Set F01.15 to 1 to achieve the function of synchronizing multiple driver pulses, when the output of drivers A and B is the same as the input pulse (no need to enable).

Chapter 7: Adjustments

7.1 Gain Adjustment General Description

Summary.

The most important performance indicators of a servo system are: stable, accurate and fast, allowing the motor to track position, speed or torque commands steadily and accurately with as little delay as possible. In order to meet the performance specifications, the gain of the servo drive control loop must be adjusted.

The following are examples.

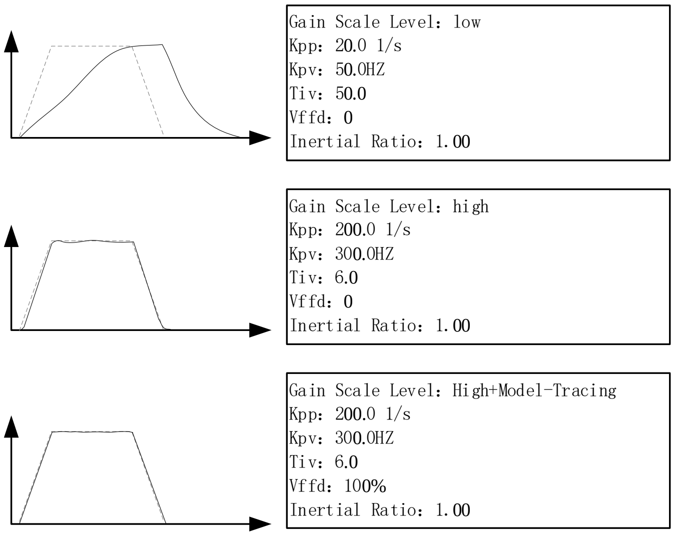


chart0-1 Effect of the same gain on the control performance

After a trial run on the motor to confirm that the drive and motor match correctly, you can debug the servo system control performance through gain adjustment, the general process of manual gain adjustment is shown in the following figure.

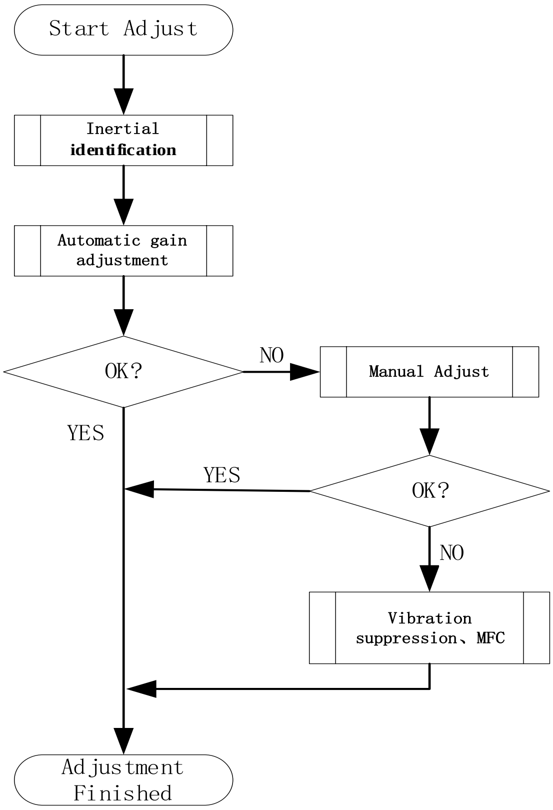


chart0-2 General flow of gain adjustment

7.2 Automatic gain adjustment

Summary.

Automatic gain adjustment means that the servo driver will automatically generate a set of matching gain parameters through the rigidity level selection function (F01.03) to meet the needs of stability, accuracy and speed.

Details.

Before starting the automatic gain adjustment process, it is important to perform a self-learning of the load parameters (which currently consists mainly of load inertia recognition) or to obtain the relevant load parameters by manual calculation.

The automatic gain adjustment flow is shown in the figure below. There are two main types of real-time self-adjustment modes (F01.02) 1- Standard mode, mainly applicable to speed and torque control; 2- Positioning mode, mainly applicable to position control mode, which is the same as standard mode when in speed control or torque control mode. level 0 has the weakest rigidity and the smallest gain; level 31 corresponds to the strongest rigidity and gain is the greatest. Depending on the type of load, the following empirical values regarding rigidity levels are available for reference.

Class 5 - Class 8: Some mechanical systems with complex transmissions and very low rigidity.

Class 9 - 14: Mechanical systems with low rigidity such as belt drives, cantilevered beam structures, etc.

Class 15 - Class 20: Ball screw, rack and pinion, direct drive systems and other mechanical systems with high rigidity.

Class 21 - 31: Very high rigidity and even direct drive systems for electronic non-standard equipment, semiconductor equipment, etc.

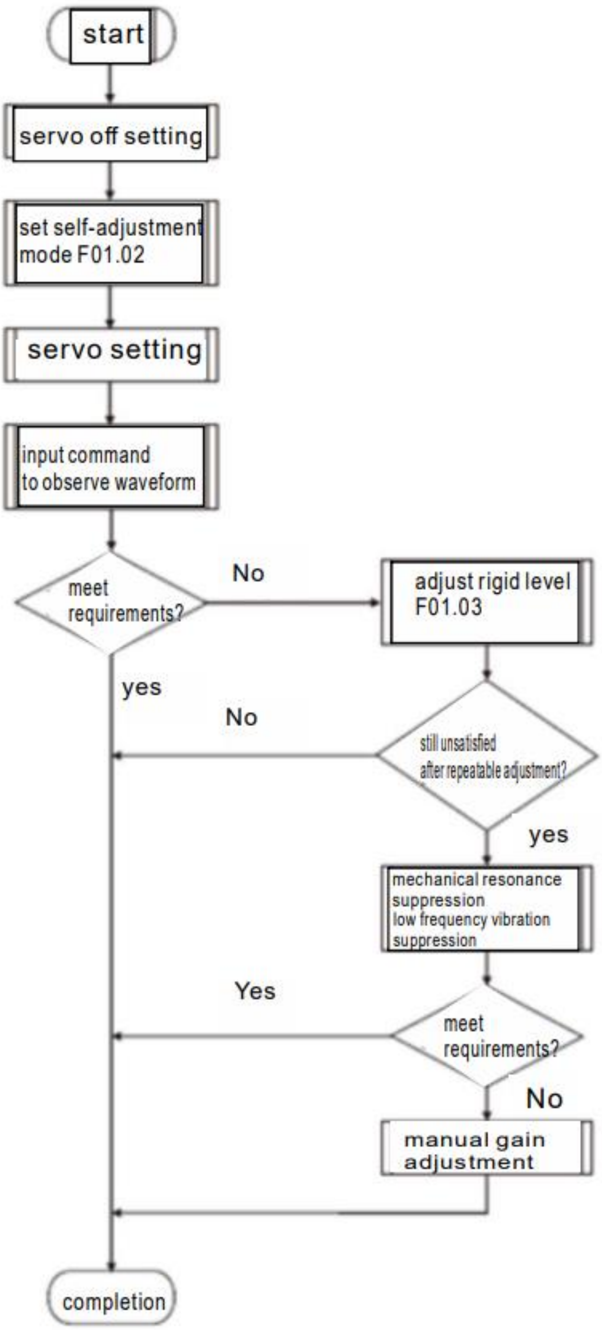


chart0-3 Automatic gain flow

Associated parameters.

group number	name (of a thing)	Setting range
F01.02	Real-time self-adjusting mode	0:Invalid 1:Standard mode (no gain switching) 2:Positioning mode (with gain switching)
F01.03	Rigidity level setting	0 **to** 31
F01.04	inertia ratio	0 **to** 60.00

Automatically updated parameters: As the rigidity level changes, the servo drive automatically calculates the gain parameters internally, thereby updating the following parameters.

function code	**name (of a thing)**	**Setting range**
F02.00	First position loop gain	1.0/s to 2000.0/s
F02.01	First speed loop gain	1.0Hz to 2000.0Hz
F02.02	First velocity loop integration time	0.15ms to 512.00ms
F02.04	First torque command filtering	0.00ms～100.00ms
F02.05	Second position loop gain	1.0/s to 2000.0/s
F02.06	Second speed loop gain	1.0Hz to 2000.0Hz
F02.07	Second velocity loop integration time	0.15ms to 512.00ms
F02.09	Second torque command filtering	0.00ms～100.00ms

Set fixed values as parameters: the following parameters will be set as fixed values

function code	name (of a thing)	setpoint
F02.03	First speed detection filtering	0
F02.08	Second speed detection filtering	0
F02.12	Speed feedforward gain	30.0%
F02.13	Speed feed-forward filtering time	0.50ms
F02.15	Torque feedforward gain	0.0%
F02.16	Torque feed-forward filtering time	0.00ms

Conditionally updated parameters: The following parameters are set to fixed values when the real-time self-tuning mode is the positioning mode, otherwise they remain at their original values.

function code	**name (of a thing)**	**instructions**	**parameter value**
F02.18	Position control switching mode	First gain fixed Second gain fixed Using the DI input (GAIN-SWITCH) Large torque command Not applicable to position control and fully closed-loop control modes Speed command large Large location deviation With position command Positioning is not completed is Large actual speed With position command plus actual speed	10
F02.19	Position control	0 ~ 1000.0ms	5.0ms

	switching delay		
F02.20	Position control switching level	0 to 20,000	50
F02.21	Position control switching hysteresis	0 to 20,000	33
F02.22	Position gain switching time	0 ~ 1000.0ms	3.3ms

7.3 Advanced control functions

7.3.1 Model Tracking Features

Overview.

Model tracking can control the position dynamic following error very well, and the model tracking function can be turned on when there are strict requirements for trajectory control, and the model tracking gain can be set according to the response demand. The larger the model tracking gain is, the faster the response will be. The following figure: the following error fluctuates around 0 in the constant speed section after model tracking is turned on.

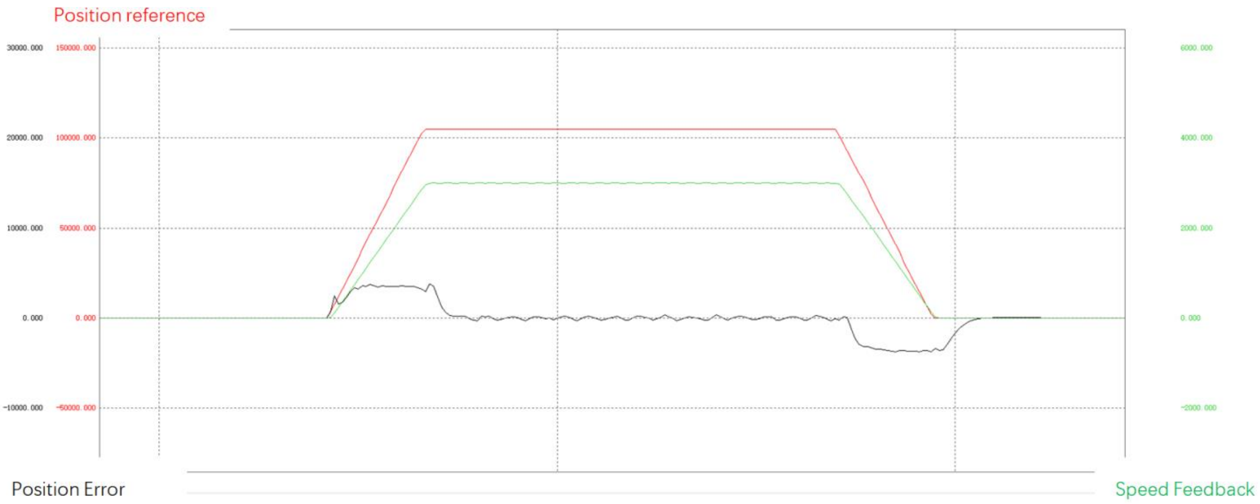


chart0-4 Model-tracking Control Plot

Related parameters.

F03.69	Model Tracking Options	Setting range	factory value	unit	Mode of entry into force	Related models		
		0 to 9	0	--	Effective immediately	P		

0: Model tracking is not enabled

1:Enable model 1, external feedforward is invalid
2:Enable model 1, external feedforward valid
3:Enable model 2, external feedforward is invalid (reserved)
4: Enable model 2, external feedforward valid (reserved)

F03.70	Model tracking gain	Setting range	factory value	unit	Mode of entry into force	Related models		
		10 to 20,000	500	0.1/s	Effective immediately	P		

10.0~2000.0 /s

7.3.2 Adaptive filters

Overview.

In actual operation, the drive's internal resonance detection module performs a spectral analysis of the motor feedback, which in turn infers the resonance frequency, and accordingly automatically sets the built-in trap filter parameters to attenuate the vibration near the resonance point. This function is only available in position control and speed control mode, and the motor is in a state of normal rotation without obstacles (not in a state of speed limit, torque limit, travel limit, position deviation counter clear, etc.).

The adaptive filter function may not be effective under the following conditions.

When the resonance point frequency is less than 3 times the velocity response frequency.

When the peak resonance is low, or the gain is so low that the effect of resonance on control performance is not apparent.

Resonance points greater than 3 or more.

When the motor speed changes sharply due to mechanical non-linearities.

In case of a sharp acceleration command (acceleration and deceleration speed absolute value greater than 30,000rpm/s).

Details.

Set the adaptive filter mode (F03.00) to a value other than 0 or 4, and enter the enable command and control command. The effect of the resonance tuning point will be shown on the motor feedback, and the spectrum analysis module will detect the mechanical resonance point and display it in

F03.29~F03.34, while the parameters of the 3rd trap filter (1, 2) or 4th trap filter (2) will be dynamically updated according to the set number of adaptive filters. In general, if mechanical vibration is detected, F03.00 can be set to 1, and the parameters of the 3rd trap filter will be updated automatically. After the parameters are stable, observe whether the mechanical vibration is effectively suppressed, and if the effect is satisfactory at this time, set F03.00 to 0, and work with fixed parameters. However, since some mechanical systems have more than one resonance point, if there is still a relatively large residual vibration, set F03.00 to 2, then the 4th trap filter parameters will also be updated automatically to attenuate the vibration of another vibration point. If the result is satisfactory, set F03.00 to 0 and work with fixed parameters. If there are still large vibrations, they can be suppressed by manually setting the parameters of the other two trap filters: 1 and 2.

Related parameters.

function code	name (of a thing)	Parameter range.
F03.00	adaptive Filter Mode	0:Adaptive invalid, 3rd,4th filter works but parameters are unchanged 1:1 adaptive filter valid (3rd filter parameters updated according to adaptive results) 2:2 adaptive filters valid (3rd and 4th filter parameters updated according to adaptive results) 3:Resonant frequency measurement, results are displayed but filter parameters are not updated 4:Clear adaptive results (adaptive is invalid and filters 3 and 4 do not work)
F03.29	Resonance point 1 frequency	0~5000Hz
F03.30	Resonance point 1 frequency width	0 to 20
F03.31	Resonance point 1 amplitude	0 to 1000
F03.32	Resonance point 2 frequency	0~5000Hz
F03.33	Resonance point 2 frequency width	0 to 20
F03.34	Resonance	0 to 1000

	point 2 amplitude	

Automatic update parameters.

F03.08	3rd trap frequency	50 to 5000Hz
F03.09	3rd trap width	0 to 12
F03.10	3rd trap depth	0 to 99
F03.11	4th trap frequency	50 to 5000Hz
F03.12	4th trap width	0 to 12
F03.13	4th trap depth	0 to 99

7.4Manual gain adjustment

7.4.1 General description

The YSK2-E Servo Drive can use its own gain adjustment function in most situations, but under certain complex conditions, automatic gain adjustment may not always result in the best performance, and it is necessary to readjust the gain parameters. This chapter will explain the manual gain adjustment method in various control modes.

When adjusting the gain parameter, the response curve of the command can be observed by the background software installed on the computer as a basis for manual adjustment of the gain parameter.

7.4.2 Adjustment of the position mode

For manual adjustment of gain during position mode, refer to the following procedure.

Set the correct load inertia value (F01.04), or set it automatically by the load parameter self-learning function (F23.03), or read the F24.07 value in real time while the motor is running and copy it to F01.04 for setting.

Now start to debug the gain parameters: first set the gain parameters to a relatively high rigidity level as possible according to the automatic gain adjustment method, then set the real-time self-tuning mode (F01.02) to 0, and fine-tune the following gain parameters manually according to the following method until the desired performance index is reached.

Note: If you need to use the second group of gain, you can separately debug the dynamic performance during acceleration and deceleration and the static performance after stopping, the second group of gain *debugging method is similar to the first group of gain, see0 Chapter*.

function code	name (of a thing)	factory value	Debugging methods
F02.00 /F02.05	First position loop gain	50.0 1/s	Observe the positioning time. If the positioning time is too long, increase this value, and decrease it. Too large is prone to vibration
F02.01 /F02.06	First speed loop gain	30.0Hz	If there is no vibration, no noise and no significant overshoot, adjust upwards, otherwise adjust downwards.
F02.02 /F02.07	First speed credit time	25.00ms	If the value is set lower, the positioning time is reduced, but if it is set too low, vibration may occur. When setting a larger value, it is difficult to converge the position deviation to 0.
F02.04 /F02.09	First torque command filtering	0.5ms	Try to change this value when vibration occurs. This value is used in conjunction with F02.02, which is positively correlated.
F02.12	Speed feedforward gain	30.0%	Increasing the feedforward gain reduces the position deviation in real time without causing vibration and noise. Uneven input commands can be improved by increasing the feedforward filter time constant F02.13. Enabling velocity feedforward requires setting F02.11 to a non-zero value.

7.4.3 Speed mode adjustment

The procedure during the speed control mode is similar to the position control mode, except for the position control related parameters F02.00 and F02.05, and the speed feed forward parameters F02.12 and F02.13, which are similar.

7.4.5 Gain switching function

Depending on the internal state or by switching the gain with an external signal, the following effects can be achieved.

1. Suppression of stoppage vibration while maximizing the dynamic response following performance of the servo
2. Increase the gain of the rectification time and shorten the positioning time
3 Gain switching according to external signals

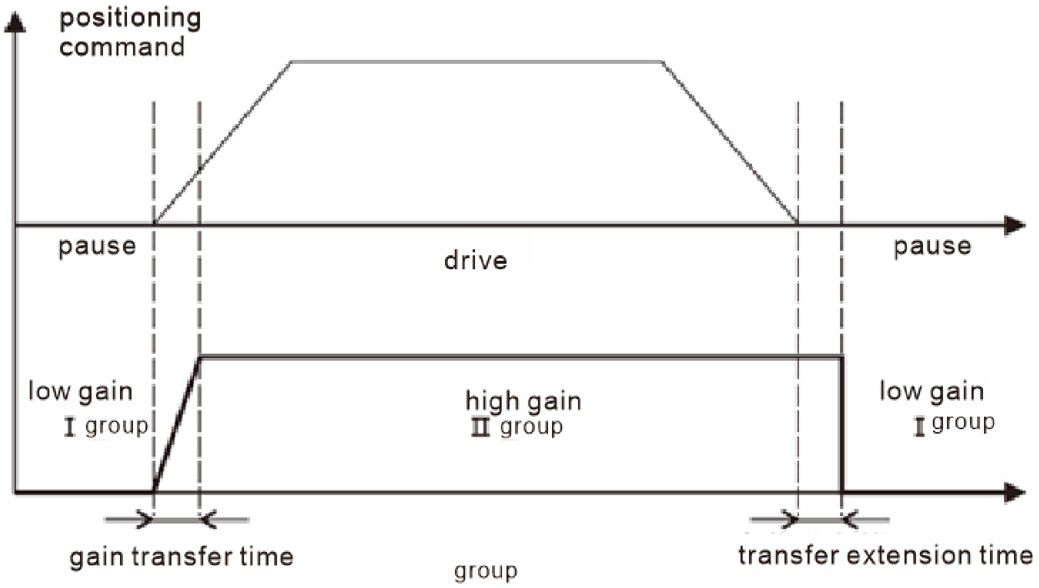


chart0-5 Example of gain switching

The following is an example of how to achieve high response following during operation and low noise and vibration during shutdown.

1. Firstly, do not enable the gain switching function, use group 1 gain, and adjust group 1 gain when there is commanded operation, so that the motor achieves good dynamic stagger performance.

2. Copy group 1 gain parameters to group 2 parameters.

3. Set the gain switching condition, F02.18 can be set to 7 or 10 when position control, while F02.19~F02.22 can be set according to the need, and the default value can be used.

4. When commanded to stop, reduce the group 1 position loop gain (F02.00) and speed loop gain (F02.01), and slightly increase the torque command filtering time (F02.04) to reduce stop noise and vibration.

Gain switching condition description.

edit size	Gain 2 toggle condition F02.18 F20.23 F02 .27	suitable usefulness pattern style	time preface chart	Delayed time F02.19 F02.24 F02.28	Switching Levels F02.20 F02.25 F02.29	switching back stall F02.21 F02.26 F02.30
0	Gain 1 fixed	PST		not applicable	not applicable	not applicable

1	Gain 2 fixed	PST		not applicable	not applicable	not applicable
2	Using DI input (GAIN-SWITCH)	PST		not applicable	not applicable	not applicable
3	Large torque command	PST	A	apply	Applicable (0.1 per cent)	Applicable (0.1%)
4	Speed commands vary widely	PS	B	apply	Applicable (10rpm/s)	not applicable
5	Speed command large	PS	C	apply	Applicable (1rpm/s)	Applicable (1rpm/s)
6	Large location deviation	P	D	apply	Applicable (1 encoder pulse unit)	Applicable (1 encoder pulse unit)
7	With position command	P	E	apply	not applicable	not applicable
8	Positioning not completed	P	F	apply	not applicable	not applicable
9	Large actual speed	P	C	apply	Applicable (1rpm/s)	Applicable (1rpm/s)
10	There are position commands plus Actual speed	P	G	apply	Applicable (1rpm/s)	Applicable (1rpm/s)

Timing diagram Please check the following diagram by number, where: 1. When the gain switching condition is: Using DI input (GAIN-SWITCH) only when the function code DI function GAIN-SWITCH switching action selection (F02.17) is set to 1 will group 1 and 2 gain switching be performed, otherwise P/PI switching of speed loop will be performed. 2. Delay time only works when returning from gain 2 to gain 1. 3. When F02.18 is equal to 10, the definition of each parameter is different from other modes.

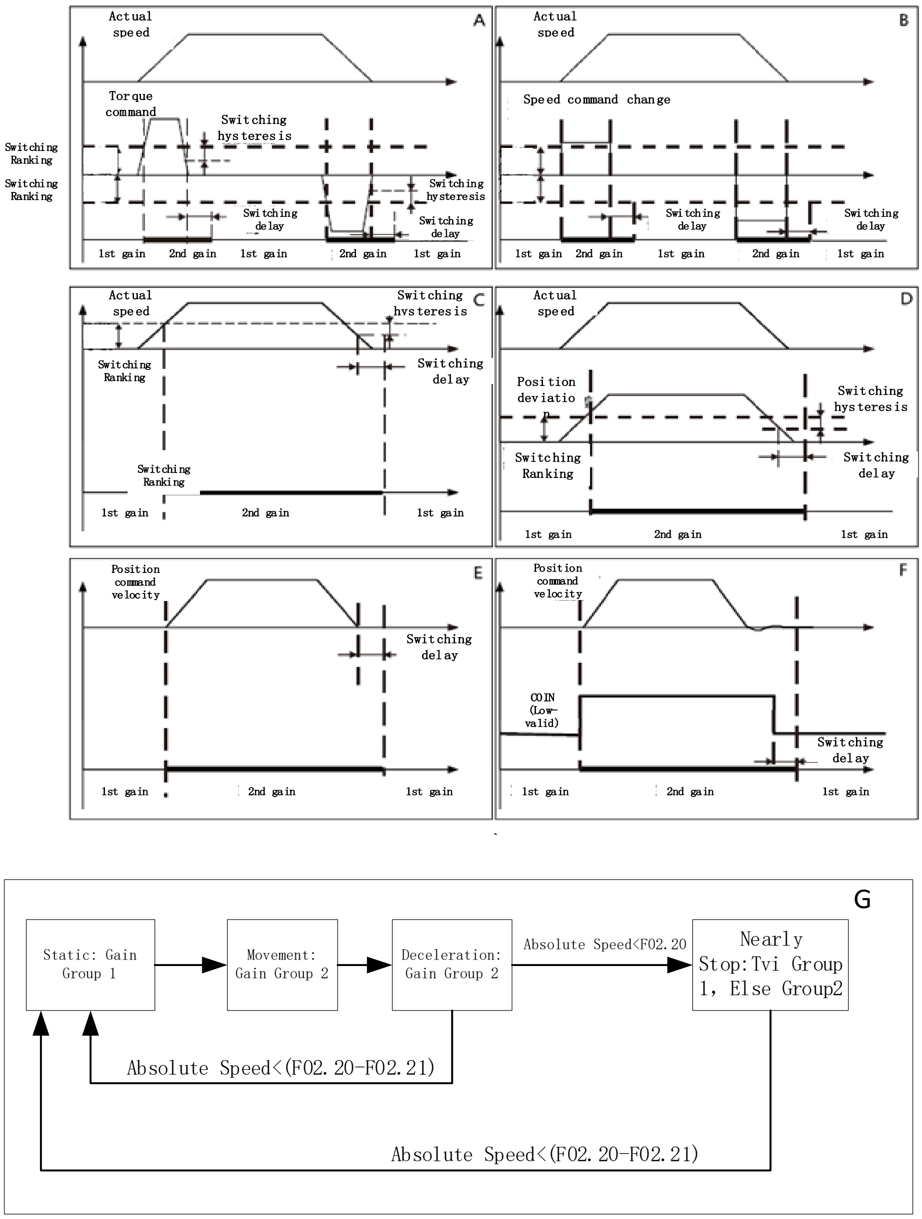


chart0-4 Gain switching timing diagram for various conditions

7.4.6 Feedforward function

For position control, the desired speed control value, i.e., the speed feedforward, can be calculated from the position control command, and the actual speed control command can be output by adding the speed command adjusted according to the feedback. Compared with the feedback-only control system, the real-time position deviation can be reduced and the system response characteristics can be improved. The larger the feedforward gain, the smaller the position deviation will be. Theoretically, when the feedforward gain is equal to 100%, the position deviation is equal to 0. The position deviation follows the following formula.

Position deviation = (position command speed / position loop gain) x (100.0% - velocity feedforward gain).

Similarly, the desired torque control value, i.e., the torque feedforward, can be calculated from the speed control command and added to the torque command adjusted according to the feedback to output the actual torque control command. Compared with a feedback-only control system, the real-time speed deviation can be reduced and the system response characteristics can be improved. In position control, the use of torque feedforward can reduce the position deviation in the acceleration constant segment. When using torque feedforward, make sure that the load inertia parameter (F01.04) is set correctly.

In practice, when the feedforward gain is too large, it may lead to obvious overshoot (position overshoot), then you can reduce vibration and noise by two methods: 1 reduce the speed feedforward gain, 2 increase the torque feedforward gain; it may also cause mechanical vibration machine operation will have a relatively large sound, then you can reduce vibration and noise by two methods: 1 reduce the speed or torque feedforward gain, 2 increase the feedforward filter time constant.

Associated parameters.

function code	name (of a thing)	Setting range	minimum unit	Factory Settings
F02.11	Speed feed forward selection	0:No speed feedforward 1:Internal speed feedforward	1	0
F02.12	Speed feedforward gain	0.0% to 100.0%	0.1%	300
F02.13	Speed feed-forward filtering time	0.00ms to 64.00ms	0.01ms	50
F02.14	Torque feedforward selection	0:No torque feedforward 1:Internal torque feedforward 2:Use TFFD as torque feedforward input	1	0
F02.15	Torque feedforward gain	0.0% to 100.0%	0.1%	0
F02.16	Torque feed-forward filtering time	0:No speed feedforward 1:Internal speed feedforward	0.01ms	0

In this case, the torque feedforward can be used as an external feedforward to the analog input, which can be used for the upper computer to calculate the torque feedforward. In this case, the torque feedforward selection (F02.14) should be set to 2, and the input channel of TFFD should be specified in the analog input-related settings, corresponding to the command and voltage.

7.4.7 Mechanical resonance suppression

The mechanical system has a certain resonant frequency, and when the servo gain is increased, it may resonate near the mechanical resonant frequency, making it impossible to continue increasing the gain. There are 2 ways to suppress mechanical resonance.

(1) Torque command filter (F02.04,F02.09,F03.17)

The torque command filter is a digital low-pass filter that suppresses mechanical resonance by setting the filter time constant so that the amplitude of the frequency components near and above the cutoff frequency of the torque command is attenuated.

Filter cut-off frequency fc(Hz) = 1000/ (2π * torque command filter time constant ms).

(2) Trap filter

The torque command filters are digital band-stop filters, and the YSK2-E Servo Drive has a total of 4 sets of series-connected trap filters to choose from. The 1st and 2nd trap filters are manually set, and the 3rd and 4th trap filters are adaptive filters.

(3) Trap filter.

When the adaptive filter is not enabled (F03.00 is not set to 1 or 2), all 4 trap filters can be adjusted manually. At this time, resonant frequency detection can still be activated by setting adaptive filter mode 3 (F03.00). After the servo is enabled, the resonance point will be calculated based on the spectrum analysis of the feedback signal and displayed in real time in F03.29~F03.34. The resonance point data can also be obtained after the modal analysis of the mechanical system by adding a vibration tester to the mechanical actuating parts if available.

function code	name (of a thing)	Setting range	minimum unit	factory value
F03.02	1st trap frequency (manual)	50 to 5000 Hz	1Hz	5000 Hz
F03.03	Width of the 1st trap	0 to 12	1	2
F03.04	1st trap depth	0 to 99	1	0
F03.05	2nd trap frequency (manual)	50 to 5000 Hz	1Hz	5000 Hz
F03.06	2nd trap frequency	0 to 12	1	2
F03.07	2nd trap width	0 to 99	1	0

F03.08	2nd trap depth	50 to 5000 Hz	1Hz	5000 Hz
F03.09	3rd trap width	0 to 12	1	2
F03.10	3rd trap depth	0 to 99	1	0
F03.11	4th trap frequency	50 to 5000 Hz	1Hz	5000 Hz
F03.12	4th trap width	0 to 12	1	2
F03.13	4th trap depth	0 to 99	1	0

where the trap frequency is the center frequency F0 of the trap filter; the trap filter width is the trap filter rejection band width coefficient, Kw = (F2-F1)/F0,F2 and F1 are the upper and lower frequencies corresponding to the attenuation-3DB in the amplitude-frequency response characteristics, and the trap filter depth is the trap filter attenuation depth coefficient, which is the amplitude ratio of the output input at the point of the trap center frequency Kd = 100 x (Aout0 / Ain0).

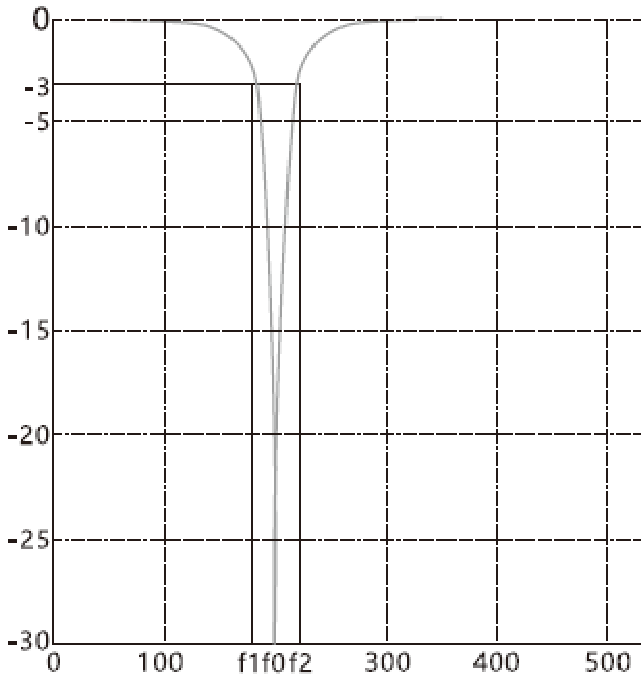


chart0-5 Amplitude and frequency characteristics of the trap filter

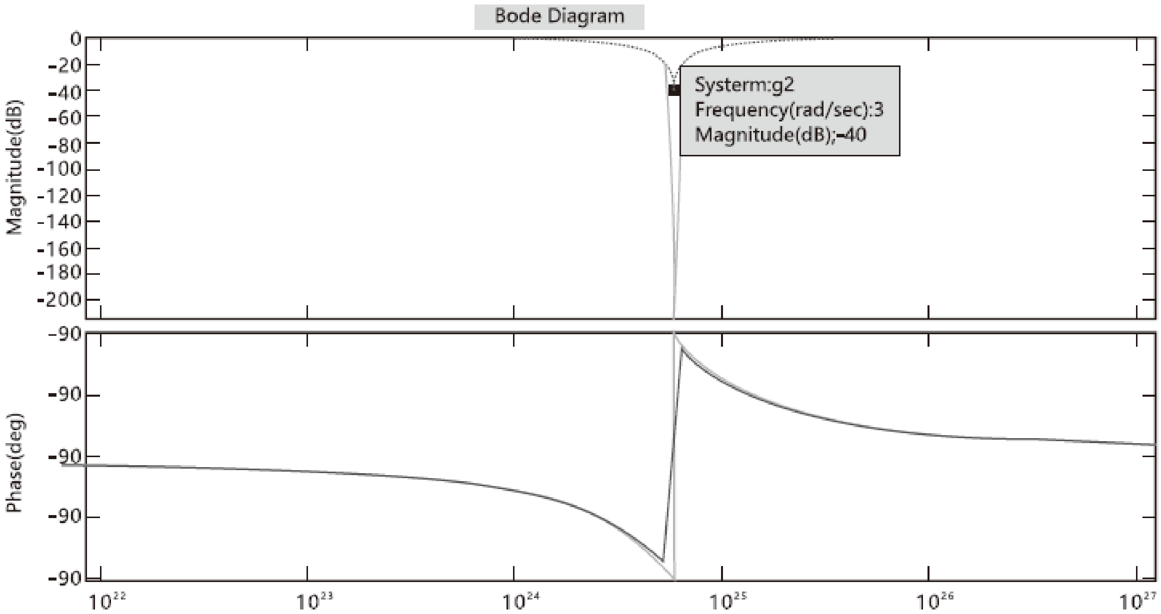


chart0-6 Frequency domain response curves for trap filter depths of 1 (0.01) and 0, respectively

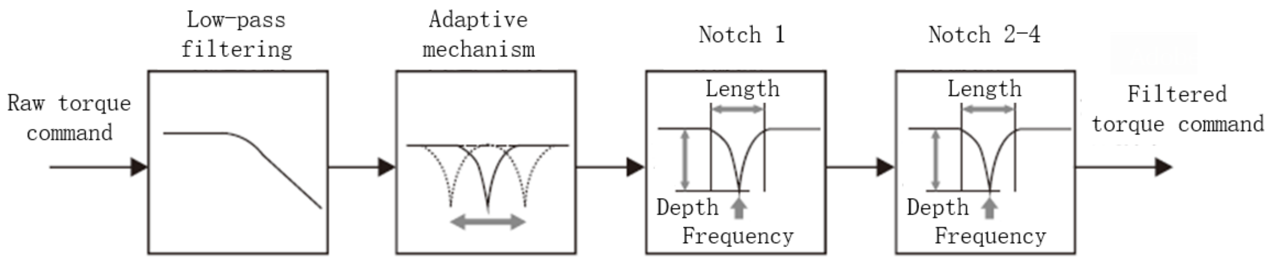


chart0-7 Location of the trap filter in the servo control system

7.4.8 Low Frequency Vibration Suppression

chart0-8 Devices with long ends prone to end vibration

If the end of the mechanical load is long, end vibration tends to occur when positioning stops, affecting the positioning effect. The frequency of this vibration is generally lower than the mechanical resonance frequency of the previous section, so it is called low-frequency vibration. The low frequency vibration suppression function can effectively reduce the vibration amplitude and decrease the positioning time.

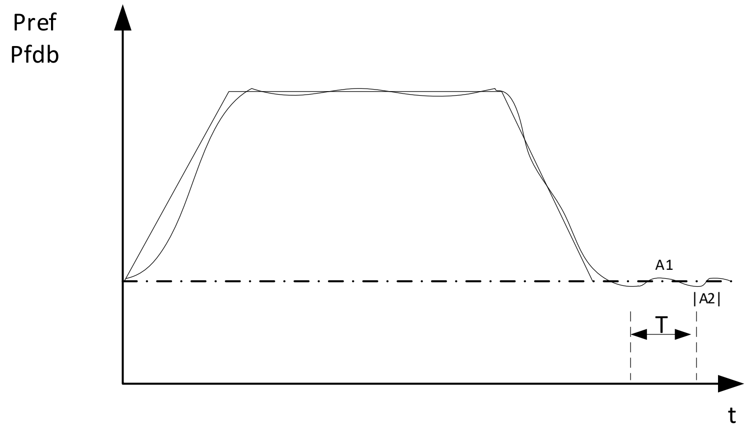


chart0-9 Low frequency vibration waveform during positioning control

If in practical application, it is encountered that there is a long end mechanism on the actuating part and there is a significant oscillation reflected in the position feedback waveform when the position command is stopped and the position deviation (or position feedback) has a periodic oscillation as shown in the figure, then you can follow the steps shown below to calculate the low frequency vibration frequency (F = 1/T) and the attenuation coefficient (attenuation coefficient = A2/A1), and correctly set to the group 1 damping parameters (F03.20, F03.21). Observe the waveform again, and if there is still periodic oscillation, continue to set the group 2 damping parameters as shown in the figure below. After the low frequency damping works, the positioning response waveform will be greatly improved and the positioning rectification time will be significantly shortened.

Associated parameters.

function code	name (of a thing)	Setting range	minimum unit	Factory Settings
F03.20	1st damping frequency	0 to 1000	0.1Hz	0
F03.21	1st damping filter setting	0 to 10	0.1	0
F03.22	2nd damping frequency	0 to 1000	0.1Hz	0
F03.23	2nd damping filter setting	0 to 10	0.1	0

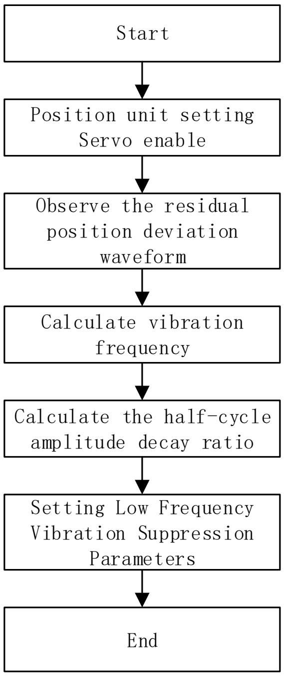


chart0-10 Low Frequency Suppression Function Operation Flow

Chapter 8: MODBUS COMMUNICATION

8.1 MODBUS Communication (Only For YSK2-A)

Using multi-slave communication, the upper controller can change the parameters of multiple servo drives, and the upper controller can observe the waveforms such as position deviation and rotation speed in the state where one and multiple servo drives are wired.

The communication conditions are shown in the table.

Communication conditions	
Electrical specifications	EIA485
Communication method	Asynchronous serial communication (half duplex)
Communication speed	2.4 kbps ~ 115.2 kbps
Data Bits	8 bit
Check digit	0 bit ~ 1 bit
Stop bit	1 bit ~ 2 bit
Alarm detection	CRC16-CCITT
Forwarding data	8 bit binary encoding
Communication data length	Less than 35 bytes

8.1.1 Rules for communication read and write parameters

The following numbers are followed by 'h' to indicate hexadecimal numbers

The communication address of the parameter: 8 bits left shift of the classification group number + the offset of the group. For example, for the value of F10.12, the address obtained by rule calculation is 0A0Ch.

(1) Without encryption, all parameters can be read and written.

(2) Some parameters cannot be rewritten when the drive is running, and an error is returned when the rewrite command is entered in communication at this time.

(3) The 32-bit function code must read and write high and low 16 bits at one time, and cannot read and write only high or low 16 bits, i.e., it can only read 32 bits with 03h command and write 32 bits with 10h command.

(4) The user password parameter only supports writing, and always returns 0 when reading, and when the password class parameter is input by communication, i.e., when it is input by 06h or 10h

command, it does not change the password value itself, but only input the password, and the password can only be modified by keyboard operation.

(5) communication write parameters, generally is only rewrite the value in the memory, not write EEPROM, such as rewrite the parameters need to write EEPROM (after power failure can be recovered), then the corresponding address value of the parameters and E000h sum as the parameter address, and then write, for example, rewrite the value of F10.12, the address is 0A0Ch, if after rewriting need to store EEPROM, the address is 0A0Ch + E000h = EA0Ch.

8.1.2 Communication read and write commands

(1) Communication read command 03h of one or more consecutive 16-bit registers

The format of the request frame for the 03h command is shown in the following table (the data in the table are all hexadecimal numbers).

Slave Address	Modbus commands	Read multiple registers starting address 8 bits higher	Low 8 bits of the starting address of the multiple registers read	Number of registers high 8 bits	Number of registers low 8 bits	CRC check word low 8 bits	CRC checkword high 8 bits
01h	03h	0Ah	04h	00h	01h	C6h	13h

The format of the reply frame for the 03h command is shown in the following table (the data in the table are all hexadecimal numbers).

Slave Address	Modbus commands	Number of bytes read	The read data value is 8 bits higher	The read data value is 8 bits lower	CRC check word low 8 bits	CRC checkword high 8 bits
01h	03h	02h	00h	0Ah	A2h	78h

(2) Communication write a 16-bit register command 0x06

The format of the request frame for the 06h command is shown in the following table (the data in the table are all hexadecimal numbers).

Slave Address	Modbus commands	Write register start address 8 bits higher	Write register start address low 8 bits	Write data value 8 bits higher	Write data value lower 8 bits	CRC check word low 8 bits	CRC checkword high 8 bits
01h	06h	0Ah	04h	00h	01h	0Ah	13h

The format of the answer frame for the 06H command is shown in the following table (the data in the table are all hexadecimal numbers).

Slave Address	Modbus commands	Write register start address 8 bits higher	Write register start address low 8 bits	Write data value 8 bits higher	Write data value lower 8 bits	CRC check word low 8 bits	CRC checkword high 8 bits
01h	06h	0Ah	04h	00h	01h	0Ah	13h

The request and answer frames of the 06h command are identical.

(3) Communication write multiple consecutive 16-bit registers command 10h

The format of the request frame for the 10h command is shown in the following table (the data in the table are all hexadecimal numbers).

01h	Slave Address
10h	Modbus commands
06h	Write multiple registers starting address 8 bits higher
00h	Low 8 bits of the starting address of the multiple registers written
00h	Number of registers high 8 bits
05h	Number of registers low 8 bits
0Ah	Total number of bytes of data written
00	The first write value is 8 bits higher
01	The first write value is 8 bits lower
00	The 2nd write value is 8 bits higher
02	The 2nd write value is 8 bits lower
00	The 3rd write value is 8 bits higher
05	The 3rd write value is 8 bits lower
00	The 4th write value is 8 bits higher
0F	The 4th write value is 8 bits lower
00h	The 5th write value is 8 bits higher
10h	The 5th write value is 8 bits lower
54	CRC check word low 8 bits
65	CRC checkword high 8 bits

The format of the answer frame for the 10H command is shown in the following table (the data in the table are all hexadecimal numbers).

Slave Address	Modbus commands	Write multiple	Low 8 bits of	Number of	Number of	CRC check	CRC checkword

		registers starting address 8 bits higher	the starting address of the multiple registers written	registers high 8 bits	registers low 8 bits	word low 8 bits	high 8 bits
01	10	06	00	00	05	00	82

(4) Error response frame

The format of the error response frames for the 03H, 06H, and 10H commands is shown in the following table (the data in the table are all hexadecimal numbers).

Slave Address	03H/06H/10H Command error response flag	Error code	CRC check word low 8 bits	CRC checkword high 8 bits
01	83/86/90	xx	CRCL	CRCH

The meaning of error codes is as follows: 01h, command error; 03h, invalid parameter; 04h, CRC checksum error.

For answering invalid parameters, generally the number of registers is 0 for 03h command, or twice the number of registers is not equal to the total number of bytes written for 0x10h command, and a maximum of 125 are allowed when reading and writing multiple registers. In addition, when returning error code 03 (i.e. invalid parameter), refer to the value of F24.70, the meaning is as follows.

16: The total number of parameters in the parameter group is exceeded, or the parameter group number is not defined.

17: The number of parameters to be read is 0.

18: 32-bit function parameters must be read at once the high and low 16 bits, not allowed to read only the low 16 bits or high 16 bits.

19: The written parameters exceed the upper and lower limits.

20: No user password has been entered or the password is invalid.

22：Read-only parameters and reserved parameters are not allowed to be rewritten, and parameters that can be rewritten only when the machine is stopped cannot be rewritten when it is running, or the parameters cannot be modified by the value of another parameter.

24: Password parameters can only be written individually, not mixed with other parameters.

25: Incorrect user password was entered.

26: The user password was entered incorrectly five times in a row.

8.1.3 Virtual IO Control

Communication DIDO reading and writing

Configuration parameters

F09.05 bit1~bit15 Correspond to DI function 1~15
F09.06 bit0~bit15 corresponds to DI function 16~31
F09.07 bit0~bit15 corresponds to DI function 32~47
F09.08 bit0~bit15 corresponds to DI function 48~63

F09.09 bit1~bit15 corresponds to DO function 1~15
F09.10 bit0~bit15 corresponds to DO function 16~31
The value of the corresponding binary bit 0 does not enable communication control; 1 enables communication control

Correspondence address

Address	Description	Properties
0x3707	Virtual DI control, bit1~bit15 corresponds to DI function 1~15, corresponding bits need to be F09.05 configured to enable, unconfigured bits write 1 invalid	write
0x3708	Virtual DI control, bit0~bit15 corresponds to DI function 16~31, corresponding bits need to be F09.06 configured to enable, unconfigured bit write 1 invalid	write
0x3709	Virtual DI control, bit0~bit15 corresponds to DI function 32~47, corresponding bits need to be F09.07 configuration enabled, unconfigured bit write 1 invalid	write
0x370A	Virtual DI control, bit0~bit15 corresponds to DI function 48~63, corresponding bits need to be F09.08 configured to enable, unconfigured bits write 1 invalid	write
0x3788	Virtual DO read, bit1~bit15 corresponds to DO function 1~15, corresponding bits need to be F09.09 configured to enable, unconfigured bit output is 0	Read
0x3789	Virtual DO reading, bit0~bit15 corresponding DO function 16~31 corresponding bits need to be F09.09 configured to enable, unconfigured bits output to 0	Read
0x378A	DI function status address 1, bit1~bit15 corresponds to DI function 1~15	Read
0x378B	DI function status address 1, bit0~bit15 corresponds to DI function 16~31	Read
0x378C	DI function status address 1, bit0~bit15 corresponds to DI function 32~47	Read

0x378D	DI function status address 1, bit0~bit15 corresponds to DI function 48~63	Read
0x378E	DO function status address 1, bit1~bit15 corresponds to DO function 1~15	Read
0x378F	DO function status address 1, bit0~bit15 corresponds to DO function 16~31	Read

Example: DI function 1 servo enable control via communication

1. Configure F09.05 = 2 (bit1 = 1) DI function 1 to enable communication control
2. Write address 0x3707 bit1 to control servo enable, communication command as follows.

Tx: 01h 06h 37h 07h 00h 02h B7h BEh //enable servo

Tx: 01h 06h 37h 07h 00h 00h 36h 7Fh //Break Enable

DO Function 1 Servo ready to read via communication

1. Configure F09.09 =2 (bit1 = 1) DO function 1 read by communication
2. Read address 0x3788 bit1 to determine the servo status? The command is as follows.

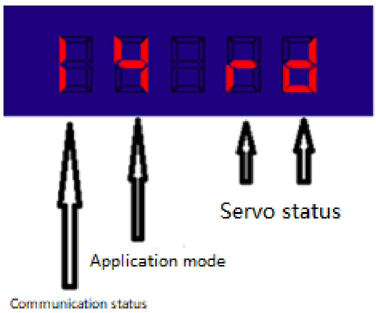
Tx: 01h 03h 37h 88h 00h 01h 0Ah 54h

Rx: 01h 03h 02h 00h 02h 39h 85h // bit1 is 1, servo ready

Chapter 9: EtherCAT Bus Description

9.1 YSK2-E Servo Drive Panel Display(Only For YSK2-E)

The panel display is divided into 3 main sections, each representing a different meaning, as detailed in the following table.



sports event	instructions
Communication status	1 Network initialization (Init) 2 Network pre-run (Pro-Op) 4 Safe operation of the network (Safe-Op) 8 Network Operations (Op)

Application mode	0 No operating mode 1 Contour Position Mode (PP) 3 Profile velocity mode (PV) 4 Contour Torque Mode (PT) 6 Back to original mode (Home) 8 Synchronous cycle position mode (CSP) 9 Synchronous cyclic velocity mode (CSV) A Synchronous Periodic Torque Mode (CST)
Servo Status	nrd: servo ready rd: servo ready run: enable state A.XX: Warning code E.XX:Fault code

a table0-1 Panel Display Description

9.2 EtherCAT communication

9.2.1 Support Mode

The YSK2-E drive EtherCAT is based on the CANOpen application layer protocol CiA 402 servo and motion control protocol. Various modes are supported up to CiA 402. The detailed description is shown in the following table.

table0-2 Support modes

CIA402 Control Mode	Does it support
Profile Position Mode (PP)	be
Profile Velocity Mode (PV)	be
Profile Torque Mode (PT)	be
Back to Original Mode (HM)	be
Synchronous Periodic Position Mode (CSP)	be
Synchronous Cycle Velocity mode (CSV)	be
Synchronous Periodic Torque Mode (CST)	be

9.2.2 EtherCAT Frame Structure

EtherCAT is an industrial communication protocol based on Ethernet for real-time control. It only extends the IEEE 802.3 Ethernet specification without any changes to the basic structure, so that data in standard Ethernet frames can be forwarded. The EtherCAT frame consists of the EtherCAT frame header and more than one EtherCAT sub-message, which is further subdivided into EtherCAT sub-messages. EtherCAT frames with Type=1 of the EtherCAT frame header only are processed according to ESC.

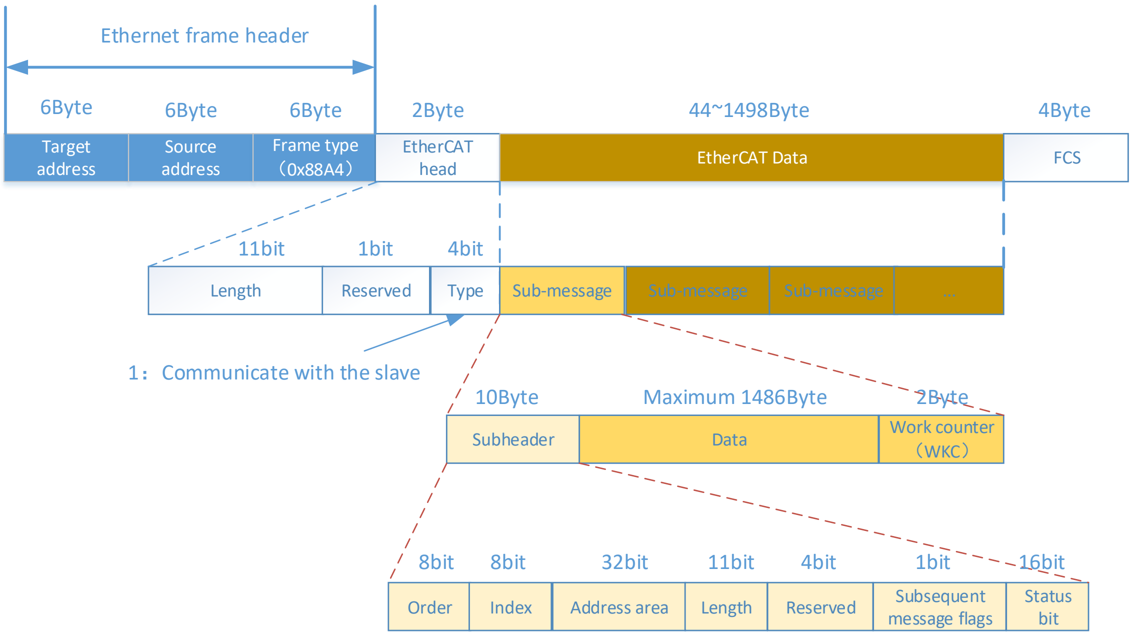


Chart9-1 EtherCAT frame format

9.2.3 EtherCAT State Machine

The migration diagram of the EtherCAT application layer state (ESM state) is shown below

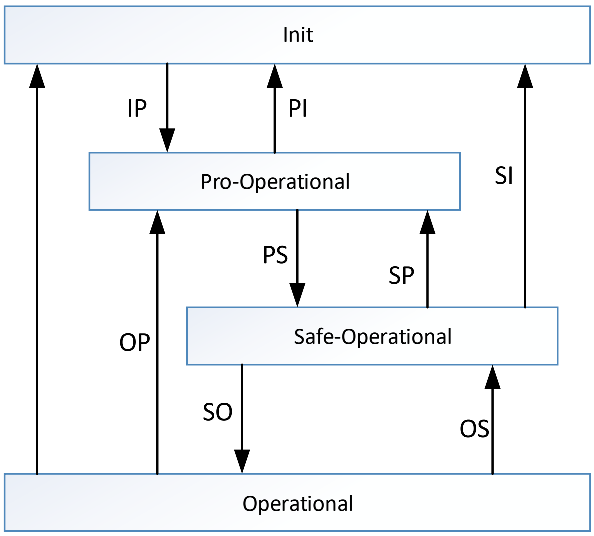


Chart9-2 EtherCAT State Machine

table0-3 Summary Table of EtherCAT State Transitions

statuses	movements	SDO	TxPDO	RXPDO
Initialization (Init)	No communication at application level, slave can only read and write ESC chip registers	No	No	No

IP	The master configures the slave site address registers. If mailbox communication is supported, configure mailbox-related registers. If distributed clocking is supported, configure DC-related registers. The master writes to the Status Control Register to request Pre-OP status	No	No	No
Pre-run (Pro-Op)	Application layer mailbox communication	Yes	No	No
PS	The master uses the mailbox to initialize the process data mapping. The master configures the SM channel used by the process data. The master configures the FMMU. Master writes to Status Control Register to request Safe-OP status.	Yes	No	No
Safe-Op	The application layer supports mailbox communication. There is process data communication, but only read-in data is allowed, no output signals are generated.	Yes	Yes	No
S0	The master sends valid output data. The master writes to the status control register to request Op status.	Yes	Yes	No
Operational (Op)	All inputs and outputs are valid.	Yes	Yes	Yes

9.2.4 Process data

The real-time data transfer based on EtherCAT is carried out via the data exchange of the PDO (Process Data Object), which is available as RxPDO from master to slave and TxPDO from master to master.

Chart9-3 Simple communication between master and slave stations

Table9-4 Default configuration of RxPDO mapping for EtherCAT

PDO	mapping pair	PDO Configuration
1600h (RPDO1) (9Byte)	Control word (6040h)	60400010
	Operating mode (6060h)	60600008
	Target position (607Ah)	607A0020
	Probe function (60B8h)	60B80010

1601h (RPDO2) (19Byte)	Control word (6040h)	60400010
	Operating mode (6060h)	60600008
	Target torque (6071h)	60710010
	Target position (607Ah)	607A0020
	Maximum motor speed (6080h)	60800020
	Probe function (60B8h)	60B80010
	Target speed (60FFh)	60FF0020
1602h (RPDO3) (15Byte)	Control word (6040h)	60400010
	Operating mode (6060h)	60600008
	Maximum torque (6072h)	60720010
	Target position (607Ah)	607A0020
	Probe function (60B8h)	60B80010
	Target speed (60FFh)	60FF0020
1603h (RPDO4) (21Byte)	Control word (6040h)	60400010
	Operating mode (6060h)	60600008
	Target torque (6071h)	60710010
	Maximum torque (6072h)	60720010
	Target position (607Ah)	607A0020
	Maximum motor speed (6080h)	60800020
	Probe function (60B8h)	60B80010
	Target speed (60FFh)	60FF0020
1604h (RPDO5) (12Byte)	Control word (6040h)	60400010
	Control mode (6060h)	60600008
	Target torque (6071h)	60710010
	Target position (607Ah)	607A0020
	Maximum profile speed (607Fh)	607F0020
	Probe function (60B8h)	60B80010
	Forward maximum torque limit (60E0h)	60E00010
	Maximum torque limit in the negative direction (60E1h)	60E10010
	Target speed (60FF)	60FF0020

Table9-5 Default configuration of TxPDO mapping for EtherCAT

PDO	mapping pair	PDO Configuration
1A00h (TXPDO1) (25Byte)	Error code (603Fh)	603F0010
	Status word (6041h)	60410010
	Position feedback (6064h)	60640020
	Control mode display (6061h)	60610008
	Probe status (60B9h)	60B90010
	Probe 1 Rising edge position	60BA0020

	feedback (60BAh)	
	Position deviation value (60F4h)	60F40020
	DI input status (60FDh)	60FD0020
	Servo internal error code (213Fh)	213F0010
1A01h (TXPDO2) (29Byte)	Error code (603Fh)	603F0010
	Status word (6041h)	60410010
	Control mode display (6061h)	60610008
	Position feedback (6064h)	60640020
	Speed feedback value (606Ch)	606C0020
	Torque feedback value (6077h)	60770010
	Probe status (60B9h)	60B90010
	Probe 1 Rising edge position feedback (60BAh)	60BA0020
	Probe 1 Falling edge position feedback (60BBh)	60BB0020
	DI input status (60FDh)	60FD0020
1A02h (TXPDO3) (25Byte)	Error code (603Fh)	603F0010
	Status word (6041h)	60410010
	Control mode display (6061h)	60610008
	Position feedback (6064h)	60640020
	Speed feedback value (606Ch)	606C0020
	Torque feedback value (6077h)	60770010
	Probe status (60B9h)	60B90010
	Probe 1 Rising edge position feedback (60BAh)	60BA0020
	DI input status (60FDh)	60FD0020
1A03h (TXPDO4) (25Byte)	Error code (603Fh)	603F0010
	Status word (6041h)	60410010
	Control mode display (6061h)	60610008
	Position feedback (6064h)	60640020
	Speed feedback value (606Ch)	606C0020
	Torque feedback value (6077h)	60770010
	Probe status (60B9h)	60B90010
	Probe 1 Rising edge position feedback (60BAh)	60BA0020
	DI input status (60FDh)	60FD0020
1A04h (TXPDO5) (22Byte)	Status word (6041h)	60410010
	Control mode display (6061h)	60610008
	Position feedback (6064h)	60640020
	Speed feedback value (606Ch)	606C0020
	Torque feedback value (6077h)	60770010
	Probe status (60B9h)	60B90010

	Probe 1 Rising edge position feedback (60BAh)	60BA0020
	Probe 2 Rising Edge Position Feedback (60BCh)	60BC0020
	Position deviation value (60F4h)	60F40020
	Error code (603Fh)	603F0010
	DI input status (60FDh)	60FD0020

9.2.5 Mailbox Data

SDO parameters are CoE-defined acyclic data communications where the master implements acyclic data interactions by reading and writing mailbox data. the YSK2-E drive can modify drive parameters via SDO.

9.2.6 distribution clock

The distributed clock enables all EtherCAT devices to use the same system time and thus control the synchronous execution of the individual device tasks. The slave devices can generate synchronization signals based on the synchronized system time. the YSK2-E drives support DC synchronization mode and FreeRun mode. the synchronization period is controlled by SYNC0 and the period range varies depending on the motion mode.

9.3 Introduction to control modes

9.3.1 Servo parameter configuration

When using the YSK2-E Servo Drive, it is sometimes necessary to manually configure the Servo Drive parameters and control mode settings, which can be set by the Servo Drive Operator Panel or the upper computer software Servo Suit, as shown in the following tabletable0-6 The contents are shown in the following table.

table0-6Support modes

parameters	name (of a thing)	Setting range	default value
F01.01	Control mode	0:Position mode 1:Speed Mode 2:Torque mode 3:Position mode/velocity mixed mode	9

		4:Position Mode/Torque Mixing Mode 5:Speed mode/torque mixing mode 9:ECAT communication mode	
F09.18	ECAT slave station number	0--65535	0
F09.23	ECAT communication write or not to EEPROM	0: ECAT communication write parameters are not saved 1: ECAT communication write parameters are saved to EEPROM	0

9.3.2 Cyclic Synchronous Position Mode (CSP)

In the cyclic synchronous position mode, the upper controller completes the position command planning, and then sends the planned target position to the servo drive periodically, and the position, speed and torque control is done internally by the servo drive.

Note: 1. other modes cut to CSP mode and need to wait 20m s before performing a position update.

2 .Before enabling on CSP mode, please set 607Ah (position command value) to follow 6064h (position feedback value), otherwise please set the first bit from the right of F09.25 to 0 to ensure the safety of machine use.

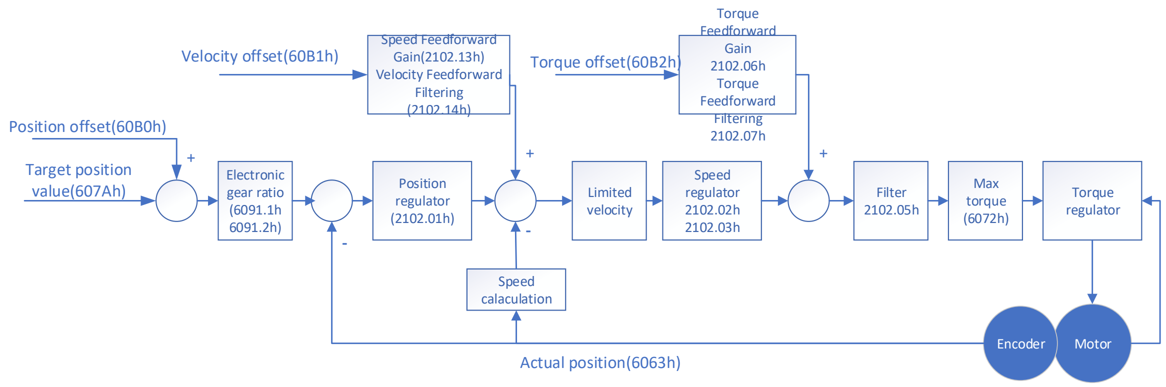


Chart9-4 Block diagram of the CSP model

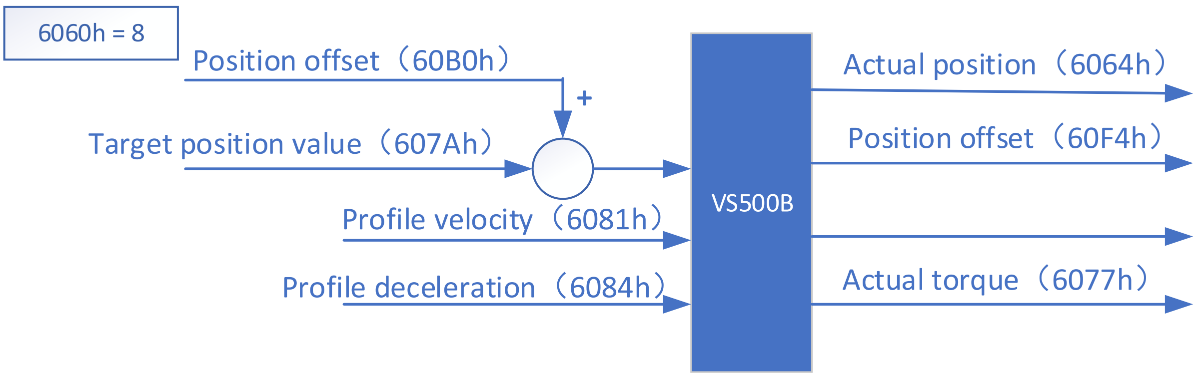


Chart9-5 CPS mode simple input and output

Control word setting for cyclic synchronous position mode (6040h)

The meaning of each bit of the control word (6040h) when the cycle synchronous position mode is selected is shown in a table0-7 shown.

a table0-7 CSP mode control word descriptions

Bit	name (of a thing)	instructions
0	Switch on	Must be set to 1 when servo is enabled.
1	Enable voltage	Must be set to 1 when servo is enabled.
2	quick stop	Must be set to 1 when servo is enabled, set to 0 for fast shutdown.
3	Operation enable	Must be set to 1 when servo is enabled.

4 to 6	CSP model set-aside	not available
7	Fault reset	A single fault reset is executed on a 0→1 change, and multiple 0→1 changes need to be generated if multiple resets are required. At this position 1, other control commands are invalid
8	pause (media player)	0: invalid, 1: valid. Stop executing the command when valid
9	CSP model set-aside	not available
10	reserve	
11~15	Manufacturer customization	not available

Status word definition for cyclic synchronous position mode (6041h)

The meaning of each bit of the status word (6041h) when the periodically synchronized position mode is selected is shown in Table 5-29. Where the background is marked in dark color is the status dedicated to the Periodic Synchronous Position mode.

Table9-8 CSP mode status word descriptions

Bit	name (of a thing)	instructions
0	Ready to switch on	0: Invalid, 1: Valid. When valid, it means the servo can be enabled
1	Switched on	0: Invalid, 1: Valid. When valid, it means the servo can be enabled
2	Operation enabled	0: Invalid, 1: Valid. When valid, it means servo is enabled
3	Servo failure	0: No fault, 1: Fault
4	Voltage enabled	0: Invalid, 1: Valid. When valid, it means the servo can be enabled
5	quick stop	0: Quick stop active, 1: Quick stop inactive
6	Switch on disabled	0: Invalid, 1: Valid. Valid means that servo is not enabled
7	warning	0: no warning, 1: with warning
8	Manufacturer customization	not available
9	remote control	0: invalid, 1: valid. When valid, it means that the control word is in effect
10	Location Arrival	60400010h bit 8 (pause) = 0. 0: position not reached, 1: position reached. 60400010h bit 8 (pause) = 1. 0: deceleration in progress, 1: speed is 0
11	Internal soft limit state	0: soft limit not reached, 1: soft limit reached
12	Whether to follow the target position	0: Not following the target position , 1: Already following the target position
13	Follow position error	0: No position deviation alarm , 1: Position deviation alarm

	alarm	occurs
14	Manufacturer customization	not available
15	Return to home base to complete	0: Invalid, 1: Completed back to the original point. For absolute value systems, F09.17 is set to 1. The value of bit15 is stored after a successful return to the home position (power-down hold), and setting P23.06 to 7 clears the stored value.

Dictionary objects associated with the cycle synchronization location pattern

Table9-9 Dictionary objects associated with the schema

index	subindex	name (of a thing)	Type of access	data type	default value
603Fh		error code	ro	unsigned16	0
6040h		control word	rw	unsigned16	0
6041h		status word	ro	unsigned16	0
6060h		Control mode	rw	integer8	0
6061h		Control mode display	ro	integer8	0
6062h		user location instruction	ro	integer32	0
6063h		Motor position feedback	ro	integer32	0
6064h		User Location Feedback	ro	integer32	0
6065h		User Position Deviation Excess Threshold	rw	unsigned32	1,000,000
6067h		Position reaches threshold	rw	unsigned32	100
6068h		Location arrival time	rw	unsigned16	1
606Bh		User speed command value	ro	integer32	0
606Ch		Actual user speed feedback	ro	integer32	0
607A		Target location	rw	integer32	0
607Ch		origin offset	rw	integer32	0
607Dh	01h	Soft limit: minimum position limit	rw	integer32	-2147483648
	02h	Soft limit: maximum position limit	rw	integer32	2147483647
60B0h		Position Offset	rw	integer32	0
60B1h		speed bias	rw	integer32	0
60B2h		Torque bias	rw	integer32	0
60F4h		User position deviation	ro	integer32	0
60FCh		Motor position command feedback	ro	integer32	0

A simple example of the use of the cycle synchronization position mode

PDO	name (of a thing)	Value setting (decimal value)
6060h	Control mode	8
6040h	enable	Arbitrary number → 6 → 7 → 15 or MC_Power
	Alarm clearing	Arbitrary number → 128 (valid on rising edge, clear if possible)
	Axis error reset	The upper computer gives or the PLC gives the command

		MC_Reset
607Ah	given position	The upper controller planning gives (including acceleration and deceleration, etc., mainly as follows)
	Analog speed control	The upper computer gives, the PLC gives the command MC_MoveVelocity
	Relative position given	The upper computer gives the PLC the command MC_MoveRelative
	Incremental Position Giving	The upper computer gives, the PLC gives the command MC_MoveAdditive
	Absolute position given	The upper computer gives, the PLC gives the command MC_MoveAbsolute
	Shaft deceleration stop	Upper unit give, PLC give command MC_Stop
	Synchronized cycle time	Upconfiguration (DC-SYN-chro)

9.3.3 Cyclic Synchronous Velocity (CSV) mode

In the cyclic synchronous speed mode, the upper controller sends the calculated target speed to the servo drive in a cyclic synchronous manner, and the speed and torque regulation is performed internally by the servo.

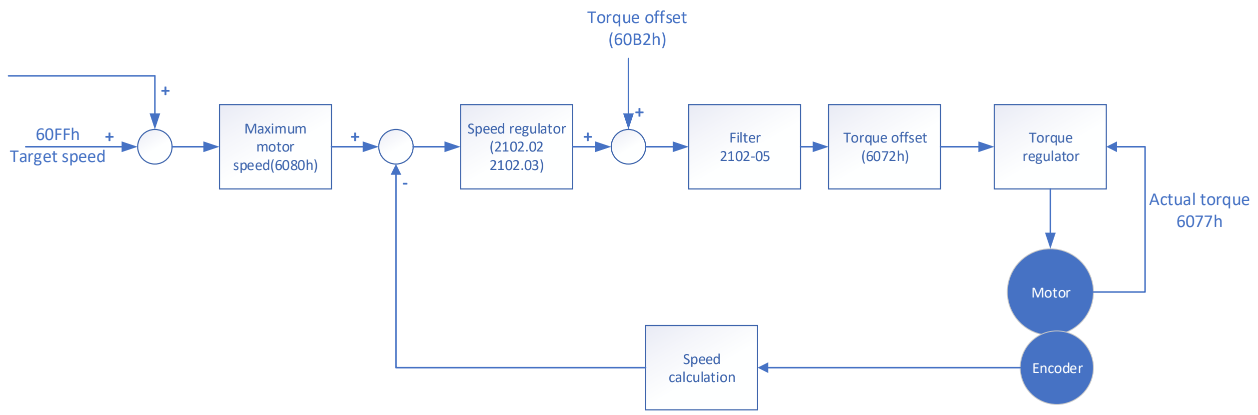


chart9-6 Block diagram of the CST model

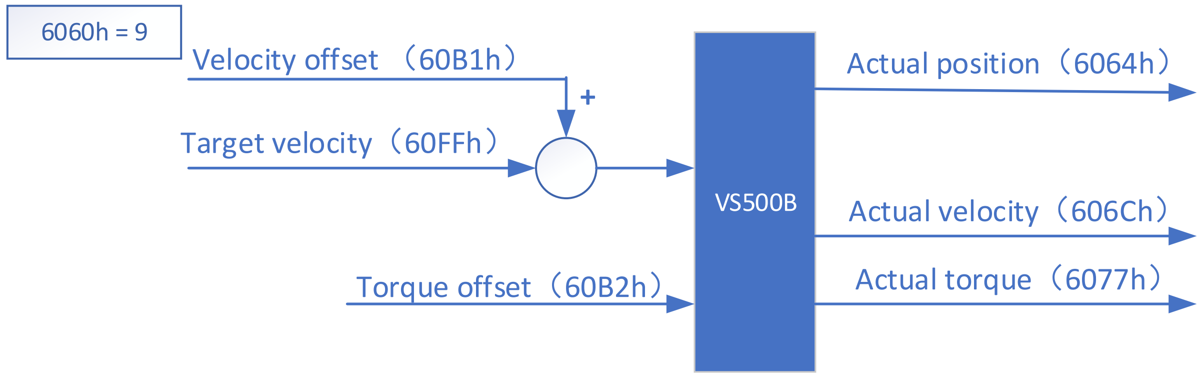


Chart 9-7 CSV mode simple input and output

Description of cycle synchronous speed mode control word (6040h)

Table9-10 CSV mode control word descriptions

Bit	name (of a thing)	instructions
0	Switch on	Must be set to 1 when servo is enabled.
1	Enable voltage	Must be set to 1 when servo is enabled.
2	quick stop	Must be set to 1 when servo is enabled, set to 0 for fast shutdown.
3	Operation enable	Must be set to 1 when servo is enabled.
4 to 6	CSV mode set aside	not available
7	Fault reset	A single fault reset is executed on a 0→1 change, and multiple 0→1 changes need to be generated if multiple resets are required. At this position 1, other control commands are invalid
8	pause (media player)	0: invalid, 1: valid. Stop executing the command when valid

9	CSV mode set aside	not available
10	reserve	not available
11~15	Manufacturer customization	not available

Status word definition for cyclic synchronous velocity mode (6041h)

Table9-11 CSV mode status word descriptions

Bit	name (of a thing)	instructions
0	Ready to switch on	0: Invalid, 1: Valid. When valid, it means the servo can be enabled
1	Switched on	0: Invalid, 1: Valid. When valid, it means the servo can be enabled
2	Operation enabled	0: Invalid, 1: Valid. When valid, it means servo is enabled
3	Servo failure	0: No fault, 1: Fault
4	Voltage enabled	0: Invalid, 1: Valid. When valid, it means the servo can be enabled
5	quick stop	0: Quick stop active, 1: Quick stop inactive
6	Switch on disabled	0: Invalid, 1: Valid. Valid means that servo is not enabled
7	warning	0: no warning, 1: with warning
8	Manufacturer customization	not available
9	remote control	0: invalid, 1: valid. When valid, it means that the control word is in effect
10	CSV mode set aside	not available
11	Internal soft limit state	0: soft limit not reached, 1: soft limit reached
12	Whether to follow the target speed	0: not following the target speed, 1: has followed the target speed
13	CSV mode set aside	not available
14 to 15	Manufacturer customization	not available

Dictionary objects related to the cyclic synchronous velocity mode

index	subindex	name (of a thing)	Type of access	data type	default value
603Fh		error code	ro	unsigned16	0
6040h		control word	rw	unsigned16	0
6041h		status word	ro	unsigned16	0
6060h		Control mode	rw	integer8	0
6061h		Control mode display	ro	integer8	0
6063h		Motor position feedback	ro	integer32	0

6064h		User Location Feedback	ro	integer32	0
606Bh		User speed command value	ro	integer32	0
606Ch		Actual user speed feedback	ro	integer32	0
606Dh		Speed reaches threshold	rw	unsigned16	100
606Eh		Speed arrival time	rw	unsigned16	1
606Fh		Zero Speed Threshold	rw	unsigned16	10
607Ch		origin offset	rw	integer32	0
607Dh	01h	Soft limit: minimum position limit	rw	integer32	-2147483648
	02h	Soft limit: maximum position limit	rw	integer32	2147483647
607Eh		command polarity	rw	unsigned8	0
6083h		Contour acceleration	rw	unsigned32	100
6084h		Profile deceleration	rw	unsigned32	100
6094h	01h	Velocity encoder factor: molecule	rw	unsigned32	1
	02h	Speed encoder factor: denominator	rw	unsigned32	1
60C5h		Maximum profile acceleration	rw	unsigned32	60,000
60C6h		Maximum profile deceleration	rw	unsigned32	60,000
60B1h		Rotational Speed Bias	rw	unsigned32	0
60B2h		Torque bias	Rw	unsigned32	0
60FFh		Target speed	rw	integer32	0

A simple example of the use of the cycle synchronization speed mode

PDO	name (of a thing)	Value setting (decimal value)
6060h	Control mode	9
6040h	enable	Arbitrary number → 6 → 7 → 15 or MC_Power
	Alarm clearing	Arbitrary number → 128 (valid on rising edge, clear if possible)
	Axis error reset	The upper computer gives, the PLC gives the command MC_Reset
60FFh	Given speed	The upper computer gives, the PLC gives the command MC_SyncMoveVelocity
	Shaft deceleration stop	The upper computer gives, the PLC gives the command MC_Stop
	Synchronous cycle time (DC-SYN-chro)	Upper computer setting

9.3.4 Cyclic Synchronous Torque Mode (CST)

In periodic synchronous torque mode, the upper controller sends the calculated target torque to the servo drive in a periodic synchronous manner, and the torque regulation is performed internally by the servo.

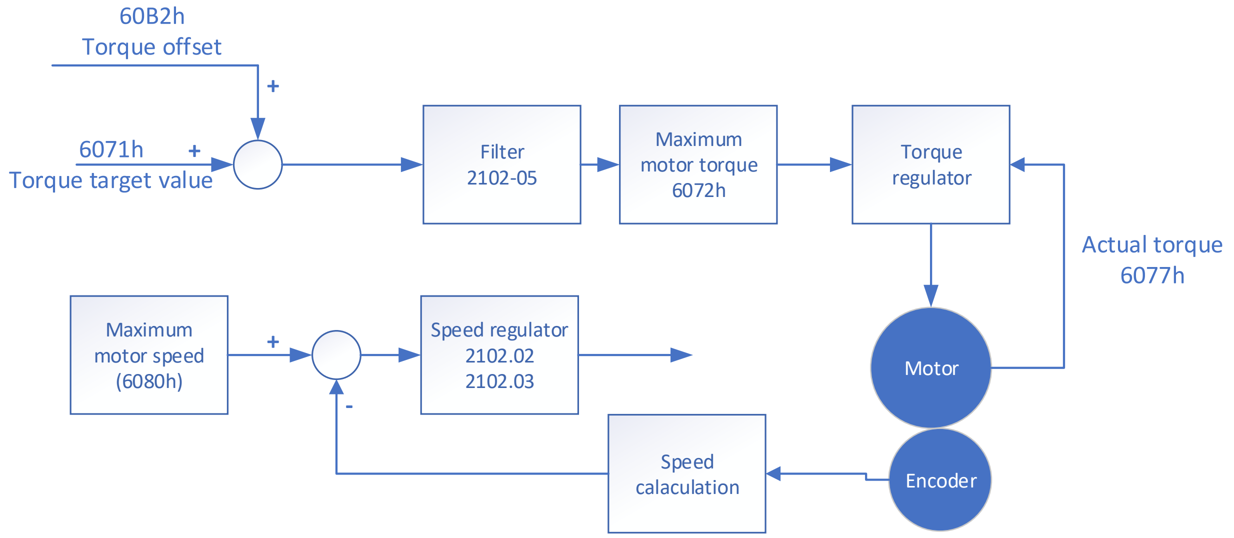


Chart9-8 Block diagram of the CST model

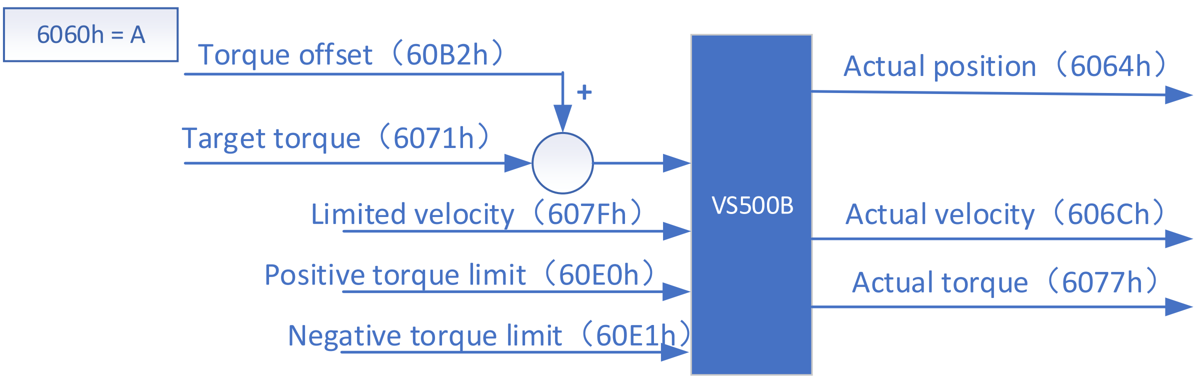


Chart9-9 cst mode simple input and output

Control word setting for cyclic synchronous torque mode (6040h)

Table 9-12 Description of cst mode control words

Bit	name (of a thing)	instructions
0	Switch on	Must be set to 1 when servo is enabled.
1	Enable voltage	Must be set to 1 when servo is enabled.
2	quick stop	Must be set to 1 when servo is enabled, set to 0 for fast shutdown.
3	Operation enable	Must be set to 1 when servo is enabled.
4 to 6	CST model set-aside	not available
7	Fault reset	A single fault reset is executed at 0→1 change, and multiple 0→1 changes need

		to be generated if multiple resets are required. At this position 1, other control commands are invalid
8	pause (media player)	0: invalid, 1: valid. Stop executing the command when valid
9~10	CST model set-aside	not available
10	reserve	not available
11~15	Manufacturer customization	not available

Status Word Definition for Periodic Synchronous Torque Mode (6041h)

Table9-13 Description of cst mode status words

Bit	name (of a thing)	instructions
0	Ready to switch on	0: Invalid, 1: Valid. When valid, it means the servo can be enabled
1	Switched on	0: Invalid, 1: Valid. When valid, it means the servo can be enabled
2	Operation enabled	0: Invalid, 1: Valid. When valid, it means servo is enabled
3	Servo failure	0: No fault, 1: Fault
4	Voltage enabled	0: Invalid, 1: Valid. When valid, it means the servo can be enabled
5	quick stop	0: Quick stop active, 1: Quick stop inactive
6	Switch on disabled	0: Invalid, 1: Valid. Valid means that servo is not enabled
7	warning	0: no warning, 1: with warning
8	Manufacturer customization	not available
9	remote control	0: invalid, 1: valid. When valid, it means that the control word is in effect
10	reserve	not available
11	Internal soft limit state	0: soft limit not reached, 1: soft limit reached
12	Whether to follow the target torque	0: Target torque not followed, 1: Target torque followed
13	CST model set-aside	not available
14 to 15	Manufacturer customization	not available

Periodic synchronous torque mode related dictionary objects

index	subindex	name (of a thing)	Type of access	data type	default value
603Fh		error code	ro	unsigned16	0
6040h		control word	rw	unsigned16	0
6041h		status word	ro	unsigned16	0

6060h		Control mode	rw	integer8	0
6061h		Control mode display	ro	integer8	0
606Ch		Actual user speed feedback	ro	integer32	0
6071h		Torque target value	rw	integer16	0
6074h		User-given torque value	ro	integer16	0
6077h		Actual torque feedback	ro	integer16	0
607Dh	01h	Soft limit: minimum position limit	rw	integer32	-2147483648
	02h	Soft limit: maximum position limit	rw	integer32	2147483647
607Fh		Maximum profile speed	rw	unsigned32	4500
6087h		Torque ramp time	rw	unsigned32	0

Example of simple use of synchronous periodic torque mode

PDO	name (of a thing)	Value setting (decimal value)
6060h	Control mode	10 (A in hexadecimal)
6071h 607Fh	Torque/Speed Giving	The user gives the PLC give command MC_TorqueControl
6040h	enable	Arbitrary number → 6 → 7 → 15/MC_Power
	Alarm clearing	Arbitrary number → 128 (valid on rising edge, clear if possible)
	Axis error reset	Upper unit give, PLC give command MC_Reset
	Cycle synchronization time (DC-SYN-chro)	Upper computer setting

9.3.5 Profile Position Mode (PP)

In contour position mode, the drive controls the motor for both absolute position positioning and relative position positioning. The upper controller can set the target position, start speed, stop speed and acceleration (deceleration) speed.The YSK2-E drive produces position commands according to the set parameters. When the contour position mode is enabled, set the object 6060H to 1

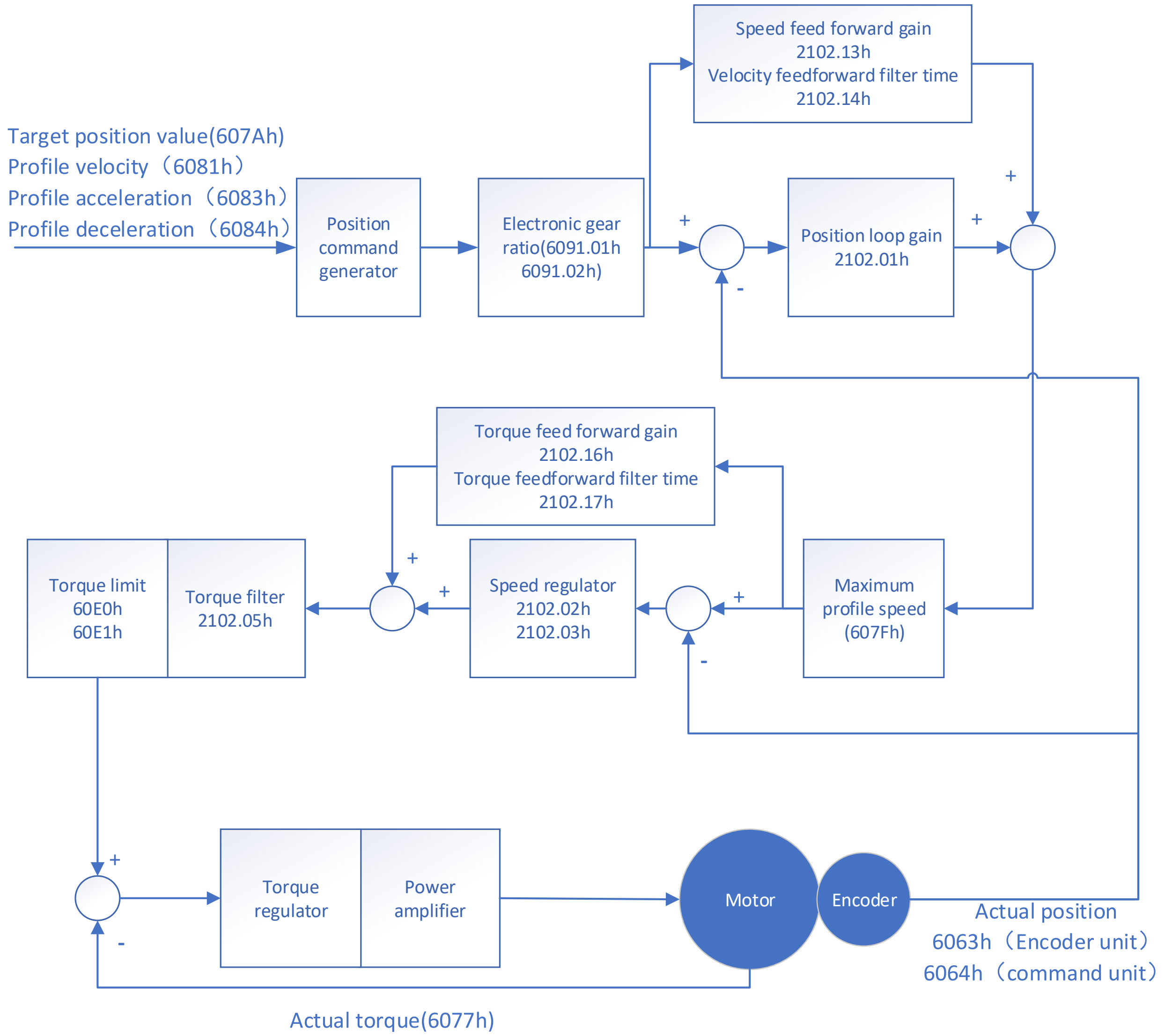


Chart 9-10 Block diagram of contour positions

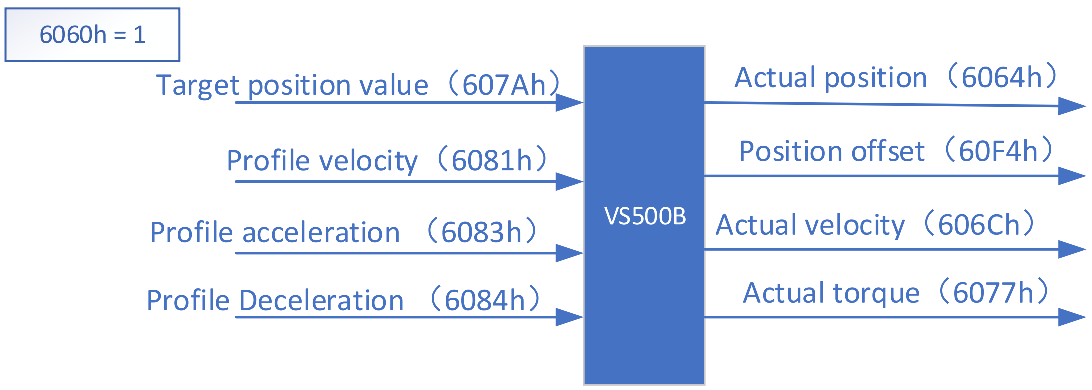


Chart9-11 Contour position simple input and output

Control word setting for profile position mode (6040h)

Table0-14 Description of PP mode status words

Bit	name (of a thing)	instructions
0	Switch on	Must be set to 1 when servo is enabled
1	Enable voltage	Must be set to 1 when servo is enabled
2	quick stop	Must be set to 1 when servo is enabled, set to 0 for fast shutdown
3	Operation enable	Must be set to 1 when servo is enabled
4	Update location command	Load the next set of position command parameters (including target position or position increment, start speed, run speed, acceleration and deceleration) on a 0→1 change
5	Update Now	0: Wait for the current position instruction to finish before executing a new instruction 1: Abort the command being executed and execute the latest position command
6	Position command type	0: absolute value command, 1: relative position command
7	Fault reset	A single fault reset is executed on a 0→1 change, and multiple 0→1 changes need to be generated if multiple resets are required. At this position 1, other control commands are invalid
8	pause (media player)	0: invalid, 1: valid. Stops execution of command when valid
9	PP model set aside	not available
10	reserve	not available
11~15	Manufacturer customization	not available

Status word definition for profile bit mode (6041h)

Table 9-15 Description of PP mode status words

Bit	name (of a thing)	instructions
0	Ready to switch on	0: Invalid, 1: Valid. When valid, it means the servo can be enabled
1	Switched on	0: Invalid, 1: Valid. When valid, it means the servo can be enabled
2	Operation enabled	0: Invalid, 1: Valid. When valid, it means servo is enabled
3	Servo failure	0: No fault, 1: Fault
4	Voltage enabled	0: Invalid, 1: Valid. When valid, it means the servo can be enabled
5	quick stop	0: Quick stop active, 1: Quick stop inactive
6	Switch on disabled	0: Invalid, 1: Valid. Valid means that servo is not enabled
7	warning	0: no warning, 1: with warning
8	Manufacturer customization	not available
9	remote control	0: invalid, 1: valid. When valid, it means that the control word is in effect
10	Location Arrival	60400010h bit 8 (pause) = 0. 0: position not reached, 1: position reached. 60400010h bit 8 (pause) = 1. 0: deceleration in progress, 1: speed is 0
11	Internal soft limit state	0: soft limit not reached, 1: soft limit reached
12	New position command received status	0: Possibility to update the position command 1: It is not possible to update the location command
13	Position deviation error	0: Position deviation value within the gauge setting range (6065h) 1: Position deviation value exceeds the set range (6065h)
14	Manufacturer customization	not available
15	Back to original completion	0: Invalid, 1: Completed back to the original point. For absolute value systems, F08.40 is set to 1. The value of bit15 is stored after a successful return to home (power-down hold), and setting F23.06 to 7 clears the stored value.

Object dictionary related to the profile position model

Table 9-16 Dictionary of PP schema-related objects

index	subindex	name (of a thing)	Type of access	data type	default value
603Fh		error code	ro	unsigned16	0
6040h		control word	rw	unsigned16	0
6041h		status word	ro	unsigned16	0
6060h		Control mode	rw	integer8	0
6061h		Control mode display	ro	integer8	0
6062h		user location instruction	ro	integer32	0

6063h		Motor position feedback	ro	integer32	0
6064h		User Location Feedback	ro	integer32	0
6065h		User Position Deviation Excess Threshold	rw	unsigned32	1,000,000
6067h		Position reaches threshold	rw	unsigned32	100
6068h		Location arrival time	rw	unsigned16	1
606Bh		User speed command value	ro	integer32	0
606Ch		Actual user speed feedback	ro	integer32	0
607Ah		Target position value	rw	integer32	0
607Ch		origin offset	rw	integer32	0
607Dh	01h	Soft limit: minimum position limit	rw	integer32	-2147483648
	02h	Soft limit: maximum position limit	rw	integer32	2147483647
607Eh		command polarity	rw	unsigned8	0
6081h		Contouring speed	rw	unsigned32	100
6083h		Contour acceleration	rw	unsigned32	100
6084h		Profile deceleration	rw	unsigned32	100
6093h	01h	Position factor: molecule	rw	unsigned32	131072
	02h	Position factor: feed constant	rw	unsigned32	10000
60F4h		User position deviation	ro	integer32	0
60FCh		Motor position command feedback	ro	integer32	0

A simple example of the use of contour position mode

Table 9-17 Simple use of PP mode

PDO	name (of a thing)	Value setting (decimal value)
6060h	Control mode	1
607Ah	given position	user setting
6081h	The given velocity under the profile position ring	-3000~3000
6040h	enable	Arbitrary number → 6 → 7 → 15/47/79/111
	Alarm clearing	Arbitrary number →128 (valid on rising edge, clear if possible)
	Absolute position given (not immediately updated)	6 → 7 → 15 → 31
	Absolute position given (immediate update)	6 → 7 → 47 → 63
	Relative position given (not immediately updated)	6 → 7 → 79 → 95
	Relative position given (immediate update)	6 → 7 → 111 → 127
6083h	Contour acceleration	0~1000rpm time: ms
6084	Profile deceleration	1000~0rpm time: ms

h		

9.3.6 Profile Velocity Mode (PV)

In profile speed mode, the upper controller sends the target speed, acceleration, and deceleration to the servo driver, which itself plans the speed command curve, and the speed and torque adjustment is performed internally by the servo.

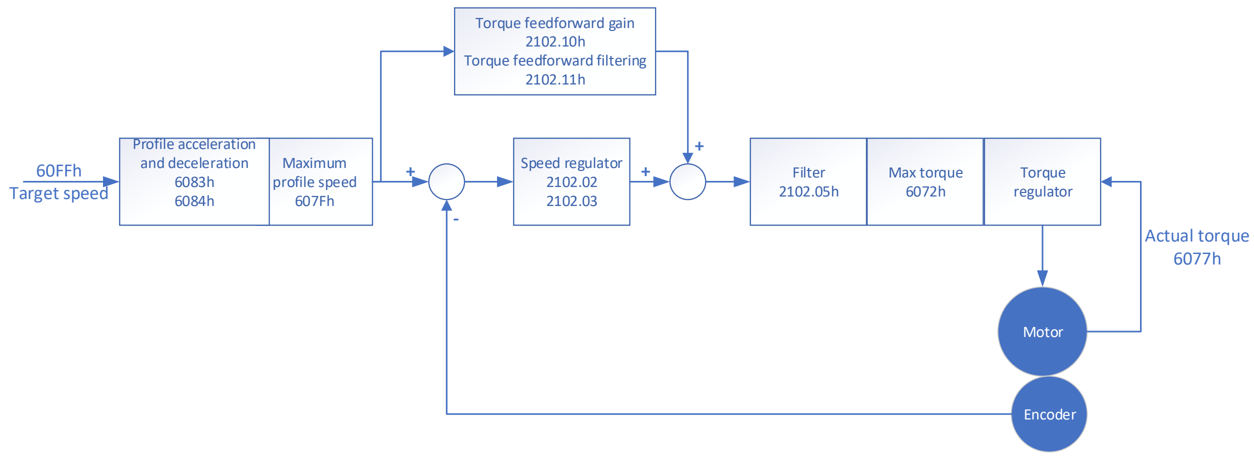


Chart 9-12 Block diagram of PV model

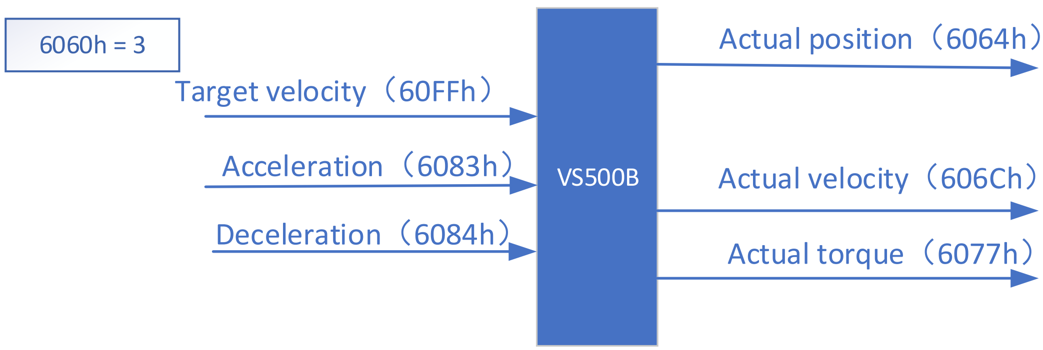


Chart 9-13 PV mode simple input and output

Control word setting for profile speed mode (6040h)

Table0-18 PV mode control word descriptions

Bit	name (of a thing)	instructions
0	Switch on	Must be set to 1 when servo is enabled.
1	Enable voltage	Must be set to 1 when servo is enabled.
2	quick stop	Must be set to 1 when servo is enabled, set to 0 for fast shutdown.
3	Operation enable	Must be set to 1 when servo is enabled.
4 to 6	PV mode set aside	not available
7	Fault reset	A single fault reset is executed on a 0→1 change, and multiple 0→1 changes need to be generated if multiple resets

		are required. At this position 1, other control commands are invalid
8	pause (media player)	0: invalid, 1: valid. Execute command when invalid, stop when valid
9	PV mode set aside	not available
10	reserve	not available
11~15	Manufacturer customization	not available

Status word definition for profile speed mode (6041h)

Table 9-19 PV mode status word descriptions

Bit	name (of a thing)	instructions
0	Ready to switch on	0: Invalid, 1: Valid. When valid, it means the servo can be enabled
1	Switched on	0: Invalid, 1: Valid. When valid, it means the servo can be enabled
2	Operation enabled	0: Invalid, 1: Valid. When valid, it means servo is enabled
3	Servo failure	0: No fault, 1: Fault
4	Voltage enabled	0: Invalid, 1: Valid. When valid, it means the servo can be enabled
5	quick stop	0: Quick stop active, 1: Quick stop inactive
6	Switch on disabled	0: Invalid, 1: Valid. Valid means that servo is not enabled
7	warning	0: no warning, 1: with warning
8	Manufacturer customization	not available
9	remote control	0: invalid, 1: valid. When valid, it means that the control word is in effect
10	Speed to	60400010h bit 8 (pause) = 0. 0: velocity not reached, 1: velocity reached. 60400010h bit 8 (pause) = 1. 0: deceleration in progress , 1: speed is 0
11	Internal soft limit state	0: soft limit not reached, 1: soft limit reached
12	zero velocity state	0: velocity not equal to 0, 1: velocity equal to 0
13	PV mode set aside	not available
14 to 15	Manufacturer customization	not available

Dictionary of objects related to profile speed patterns

index	subindex	name (of a thing)	Type of access	data type	default value
603Fh		error code	ro	unsigned16	0

6040h		control word	rw	unsigned16	0
6041h		status word	ro	unsigned16	0
6060h		Control mode	rw	integer8	0
6061h		Control mode display	ro	integer8	0
6063h		Motor position feedback	ro	integer32	0
6064h		User Location Feedback	ro	integer32	0
606Bh		User speed command value	ro	integer32	0
606Ch		Actual user speed feedback	ro	integer32	0
606Dh		Speed reaches threshold	rw	unsigned16	100
606Eh		Speed arrival time	rw	unsigned16	1
606Fh		Zero Speed Threshold	rw	unsigned16	10
607Ch		origin offset	rw	integer32	0
607Dh	01h	Soft limit: minimum position limit	rw	integer32	-2147483648
	02h	Soft limit: maximum position limit	rw	integer32	2147483647
607Eh		command polarity	rw	unsigned8	0
6083h		Contour acceleration	rw	unsigned32	100
6084h		Profile deceleration	rw	unsigned32	100
6094h	01h	Velocity encoder factor: molecule	rw	unsigned32	1
	02h	Speed encoder factor: denominator	rw	unsigned32	1
60C5h		Maximum profile acceleration	rw	unsigned32	200
60C6h		Maximum profile deceleration	rw	unsigned32	200
60FFh		Target speed	rw	integer32	0

A simple example of the use of profile speed mode

PDO	name (of a thing)	Value setting (decimal value)
6060h	Control mode	3
60FFh	Contour speed given	-3000~3000
6040h	enable	Arbitrary number → 6 → 7 → 15
	Alarm clearing	Arbitrary number → 128 (valid on rising edge, clear if possible)
	Motor rotation	Give point speed command after enable
6083h	Contour acceleration	user setting
6084h	Profile deceleration	user setting

9.3.7 Profile Torque Mode (PT)

In profile torque mode, the upper controller sends the target torque 6071h and the torque ramp constant 6087h to the servo driver, which itself plans the torque command curve, and the torque adjustment is performed internally by the servo.

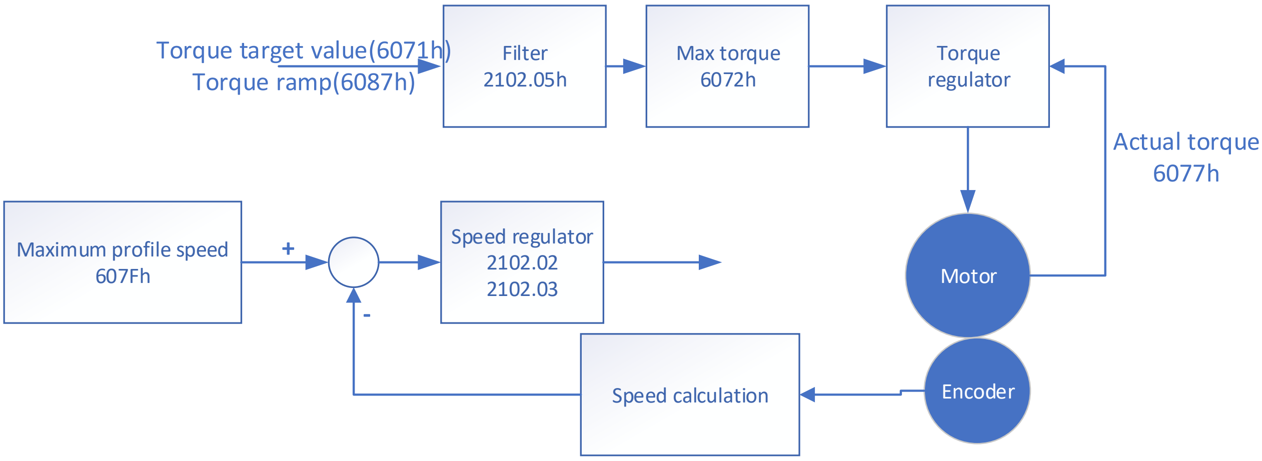


Chart 9-14 Block diagram of the PT model

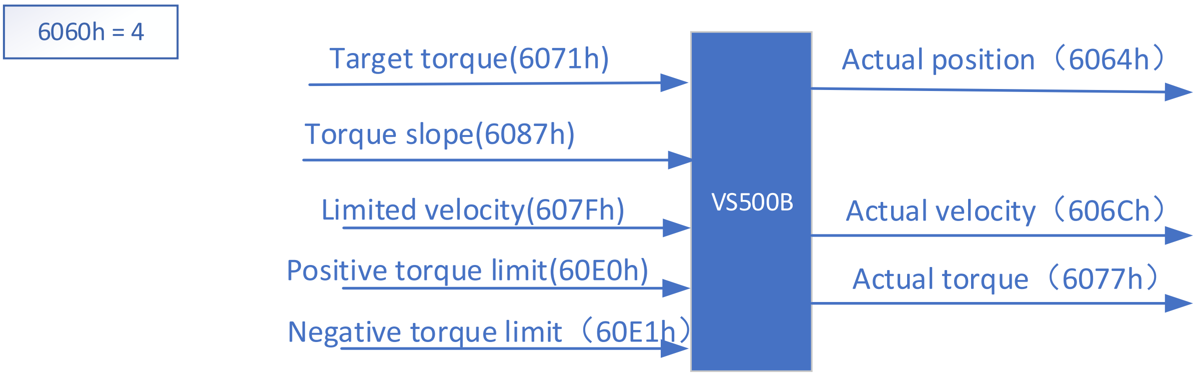


Chart 9-15 PT mode simple input and output

Control word setting for profile torque mode (6040h)

Table0-20 PT mode control word descriptions

Bit	name (of a thing)	instructions
0	Switch on	Must be set to 1 when servo is enabled.
1	Enable voltage	Must be set to 1 when servo is enabled.
2	quick stop	Must be set to 1 when servo is enabled, set to 0 for fast shutdown.
3	Operation enable	Must be set to 1 when servo is enabled.
4 to 6	PT mode reserved	not available
7	Fault reset	A single fault reset is executed on a 0→1 change, and multiple 0→1 changes need to be generated if multiple resets are required. At this position 1, other control commands are invalid
8	pause (media player)	0: invalid, 1: valid. Execute command when invalid, stop when valid

9	PT mode reserved	not available
10	reserve	not available
11~15	Manufacturer customization	not available

Status word definition for profile torque mode (6041h)

Table 9-21 Description of profile position status words

Bit	name (of a thing)	instructions
0	Ready to switch on	0: Invalid, 1: Valid. When valid, it means the servo can be enabled
1	Switched on	0: Invalid, 1: Valid. When valid, it means the servo can be enabled
2	Operation enabled	0: Invalid, 1: Valid. When valid, it means servo is enabled
3	Servo failure	0: No fault, 1: Fault
4	Voltage enabled	0: Invalid, 1: Valid. When valid, it means the servo can be enabled
5	quick stop	0: Quick stop active, 1: Quick stop inactive
6	Switch on disabled	0: Invalid, 1: Valid. Valid means that servo is not enabled
7	warning	0: no warning, 1: with warning
8	Manufacturer customization	not available
9	remote control	0: invalid, 1: valid. When valid, it means that the control word is in effect
10	Torque reached	0: Torque not reached , 1: Torque reached
11	Internal soft limit state	0: soft limit not reached, 1: soft limit reached
12, 13	PT mode reserved	not available
14, 15	Manufacturer customization	not available

Dictionary of objects related to the profile torque model

Table 9-22 Dictionary of PT schema-related objects

index	subindex	name (of a thing)	Type of access	data type	default value
603Fh		error code	ro	unsigned16	0
6040h		control word	rw	unsigned16	0
6041h		status word	ro	unsigned16	0
6060h		Control mode	rw	integer8	0
6061h		Control mode display	ro	integer8	0
606Ch		Actual user speed feedback	ro	integer32	0
6071h		Torque target value	rw	integer16	0

6074h		User-given torque value	ro	integer16	0
6077h		Actual torque feedback	ro	integer16	0
607Dh	01h	Soft limit: minimum position limit	rw	integer32	-2147483648
	02h	Soft limit: maximum position limit	rw	integer32	2147483647
6080h		Max. motor speed	rw	unsigned32	4500
6087h		Torque ramp	rw	unsigned32	0

Example of simple use of profile torque mode

PDO	name (of a thing)	Value setting (decimal value)
6060h	Control mode	4
607Fh	Maximum speed limit in profile torque mode	user setting
6071h	Contour torque given	User-given
6040h	enable	Arbitrary number → 6 → 7 → 15
	Alarm clearing	Arbitrary number → 128 (valid on rising edge, clear if possible)
	Motor rotation	Give command after enable
6087h	Torque ramp	User setting (acceleration and deceleration in torque mode)

9.3.8 Back to the original model description (HM)

Depending on the home switch signal, the limit switch signal and the encoder Z signal, the CiA402 protocol defines 31 return modes. To enable this mode, set the object 6060H to 6

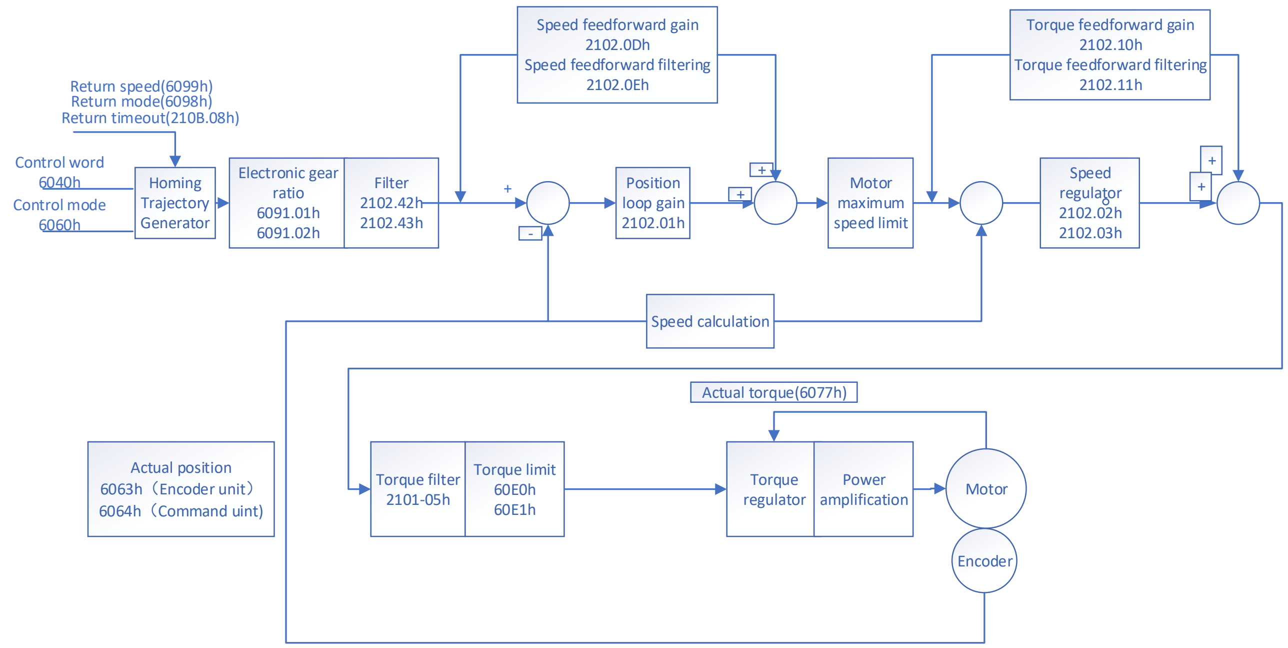


Chart 9-16 Block diagram of the origin model

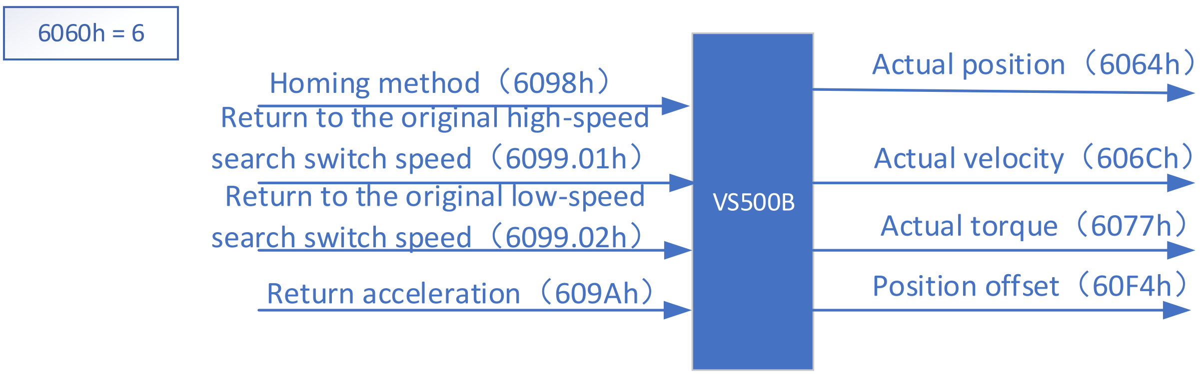


Chart 9-17 Back to the original mode simple input and output

Control word setting in home return mode (6040h)

Table 9-23 Description of Back to Home Mode Control Words

Bit	name (of a thing)	instructions
0	Switch on	Must be set to 1 when servo is enabled.
1	Enable voltage	Must be set to 1 when servo is enabled.
2	quick stop	Must be set to 1 when servo is enabled, set to 0 for fast shutdown.
3	Operation enable	Must be set to 1 when servo is enabled.
4	return to enable	0: Invalid, 1: Valid. When valid, the home return process is started and must remain valid throughout the home return, switching to invalid stops the home return process
5, 6	Origin mode reserved	not available
7	Fault reset	A single fault reset is executed on a 0→1 change, and multiple 0→1 changes need to be generated if multiple resets are required. At this position 1, other control commands are invalid
8	pause (media player)	0: Invalid, 1: Valid. Deceleration stops back to the home process when valid.

9	Origin mode reserved	not available
10	reserve	not available
11~15	Manufacturer customization	not available

Status word definition for origin regression mode (6041h)

Table 9-24 Back to the original mode status word description

Bit	name (of a thing)	instructions
0	Ready to switch on	0: Invalid, 1: Valid. When valid, it means the servo can be enabled
1	Switched on	0: Invalid, 1: Valid. When valid, it means the servo can be enabled
2	Operation enabled	0: Invalid, 1: Valid. When valid, it means servo is enabled
3	Servo failure	0: No fault, 1: Fault
4	Voltage enabled	0: Invalid, 1: Valid. When valid, it means the servo can be enabled
5	quick stop	0: Quick stop active, 1: Quick stop inactive
6	Switch on disabled	0: Invalid, 1: Valid. Valid means that servo is not enabled
7	warning	0: no warning, 1: with warning
8	Manufacturer customization	not available
9	remote control	0: invalid, 1: valid. When valid, it means that the control word is in effect
10	Location Arrival	6040h bit 8 (pause) = 0, 0: position not reached, 1: position reached. 6040h bit 8 (pause) = 1, 0: deceleration in progress, 1: speed is 0
11	Internal soft limit state	0: soft limit not reached, 1: soft limit reached
12	Return to the origin to complete the output	0: Return to origin incomplete, 1: Return to origin complete
13	return error	0: No error, 1: Error occurred at the return point
14	Manufacturer customization	not available
15	Back to original completion	0: Invalid, 1: Completed back to the original point. For absolute systems: F08.24 = 1, F08.40 = 1, the value of bit15 is stored after a successful return (power-down hold), setting F23.06 to 7 will clear the stored value

Dictionary of objects related to the origin regression pattern

Table 9-25 Back to the original schema-related object dictionary

index	subindex	name (of a thing)	Type of access	data type	default value
603Fh		error code	ro	unsigned16	0
6040h		control word	rw	unsigned16	0
6041h		status word	ro	unsigned16	0
6060h		Control mode	rw	integer8	0
6061h		Control mode display	ro	integer8	0

6062h		user location instruction	ro	integer32	0
6063h		Motor position feedback	ro	integer32	0
6064h		User Location Feedback	ro	integer32	0
6065h		User Position Deviation Excess Threshold	rw	unsigned32	1,000,000
6067h		Position reaches threshold	rw	unsigned32	100
6068h		Location arrival time	rw	unsigned16	1
606Bh		User speed command value	ro	integer32	0
606Ch		Actual user speed feedback	ro	integer32	0
607Ch		origin offset	rw	integer32	0
607Dh	01h	Soft limit: minimum position limit	rw	integer32	-2147483648
	02h	Soft limit: maximum position limit	rw	integer32	2147483647
6098h		return to original mode	rw	integer8	0
6099h	01h	Search for deceleration point signal speed in return to home mode	rw	unsigned32	100
	02h	Search for home switch signal speed in return home mode	rw	unsigned32	10
609Ah		return to original acceleration	rw	unsigned32	100

Easy to use tutorial for origin return mode

address	name (of a thing)	Value setting (decimal value)
60608h	Control mode	6
6098h	return to original mode	1~35
6040h		
	Alarm clearing	Arbitrary number → 128 (valid on rising edge)
	return to the original	6 → 7 → 15 → 31 (back to the original process to be always 31)
6099.01h	Search for deceleration point signal speed in return to home mode	0~3000rpm (default is user unit)
6099.02h	Search for home switch signal speed in return home mode	0~3000rpm (default is user unit)
609Ah	return to original acceleration	0~1000rpm time: ms (default is user unit)

Introduction to the origin return model

The CiA402 has 31 internally defined return methods (for CANOpen/EtherCAT) astable0-26 described. The following descriptions indicate the home position sensor signal by HSW, the negative limit signal by NL, and the positive limit signal by PL. ON indicates the valid state of the signal and

OFF indicates the invalid state of the signal. OFF→ON indicates the jumping edge of the signal from the invalid state to the valid state, and ON→OFF indicates the jumping edge of the signal from the valid state to the invalid state. The following describes various home mode operation trajectories and signal state changes respectively, and the meaning of icons in various back home mode diagrams are asChart 9-18 The meaning of the icons in the diagrams of various return home modes is shown.

table0-26Introduction to the Back-to-Home Model

return to original form	instructions
0	not
1	Start in the negative direction and switch to low speed when the OFF→ON state of NL is encountered in the negative direction, then backtrack to find the nearest Z pulse position as the home position
2	Start in the forward direction, switch to low speed when the PL's OFF→ON state is encountered during forward operation, and then back off to find the nearest Z pulse position as the home position.
3	If the HSW is invalid at start, run in the positive direction, otherwise run in the negative direction. When running in negative direction, switch to low speed when HSW When the HSW is ON→OFF, switch to low speed, and then continue to run in the negative direction to find the nearest Z pulse position as the home position.
4	If the HSW is invalid at start, run in the positive direction, otherwise run in the negative direction. If the HSW is OFF→ON when running in the positive direction, switch to low speed. When the HSW is OFF→ON, switch to low speed, and then continue to run in the positive direction to find the nearest Z pulse position as the home position.
5	If the HSW is invalid at the start, run in the negative direction, otherwise run in the positive direction. If the HSW is ON→OFF when running in the positive direction, switch to low speed. When the HSW is ON→OFF, switch to low speed, and then continue to run in the forward direction to find the nearest Z pulse position as the home position.
6	If the HSW is invalid at start, run in the negative direction, otherwise run in the positive direction. When running in negative direction, switch to low speed when HSW When the HSW is ON→OFF, switch to low speed, then continue to run in the negative direction to find the nearest Z pulse position as the home position.
7	If the HSW is invalid at start, run in the positive direction, otherwise run in the negative direction. When running in negative direction, switch to low speed when HSW When the HSW is ON→OFF, switch to low speed, and then continue to run in the negative direction to find the nearest Z pulse position as the home position.
8	If the HSW is invalid at start, run in the positive direction, otherwise run in the negative direction. If the HSW is OFF→ON when running in the positive direction, switch to low speed. When the HSW is OFF→ON, switch to low speed, and then continue to run in the positive direction to find the nearest Z pulse position as the home position.
9	The start is in the positive direction, regardless of whether the HSW is active or inactive. When running in the negative direction, switch to low speed when the HSW When the HSW is OFF→ON, switch to low speed, then continue to run in the negative direction to find the nearest Z pulse position as the home

	position.
10	The start is in the forward direction, regardless of whether the HSW is active or inactive. When running in the forward direction, switch to low speed when the HSW is ON →OFF state, switch to low-speed operation, and then continue forward operation to find the nearest Z pulse position as the home position.
11	If the HSW is invalid at the start, run in the negative direction, otherwise run in the positive direction. If the HSW is ON→OFF when running in the positive direction, switch to low speed. When the HSW is ON→OFF, switch to low speed, and then continue to run in the forward direction to find the nearest Z pulse position as the home position.
12	If the HSW is invalid at start, run in the negative direction, otherwise run in the positive direction. When running in negative direction, switch to low speed when the HSW If the HSW is OFF→ON, switch to low speed, and then continue to run in the negative direction to find the nearest Z pulse position as the home position.
13	The start is in the negative direction, regardless of whether the HSW is active or inactive. When running in the positive direction, switch to low speed when the HSW Then continue to run in the forward direction and find the nearest Z pulse position as the home position.
14	The start is in the negative direction, regardless of whether the HSW is active or inactive. When running in the negative direction, switch to low speed when the HSW is ON →OFF state, then continue to run in the negative direction and find the nearest Z pulse position as the home position.
15	retain
16	retain
17	Similar to method 1, but instead of finding the Z pulse, the OFF→ON state position of NL encountered during negative operation is used as the origin. point
18	Similar to method 2, but instead of looking for a Z pulse, the OFF→ON state position of PL is encountered during forward operation as the home position. point
19	Similar to method 3, but instead of finding the Z pulse, the position of the ON→OFF state of the HSW encountered during negative operation is used as the home position
20	Similar to method 4, but instead of looking for a Z pulse, the OFF→ON state position of the HSW is encountered during forward operation. home position
21	Similar to method 5, but instead of looking for a Z pulse, the position of the ON→OFF state of the HSW encountered during forward operation is used as the home position
22	Similar to method 6, but instead of finding the Z pulse, the OFF→ON state position of the HSW is encountered during negative operation as the home position
23	Similar to method 7, but instead of finding the Z pulse, the position of the ON→OFF state of the HSW is encountered when running in the negative direction as the origin. as the origin
24	Similar to mode 8, but instead of looking for a Z pulse, the OFF→ON state position of the HSW is encountered as the origin when running in the forward direction. as the origin
25	Similar to method 9, but instead of finding the Z pulse, the OFF→ON state position of the HSW is encountered when running in the negative direction as the origin. as the origin
26	Similar to method 10, but without the Z pulse, the position of the ON→OFF state of the HSW is encountered when running in the forward direction. as the origin
27	Similar to method 11, but instead of finding the Z pulse, the position of the ON→OFF state of the HSW is encountered when running in the forward direction. as the origin
28	Similar to mode 12, but without the Z pulse, the OFF→ON state position of the HSW is encountered

	when running in the negative direction as the origin
29	Similar to method 13, but without the Z pulse, the OFF→ON state position of the HSW is encountered when running in the forward direction. as the origin
30	Similar to mode 14, but without the Z pulse, the ON→OFF state position of the HSW is encountered when running in the negative direction as the origin
31	retain
32	retain
33	Find the nearest Z pulse position in the negative direction as the origin when starting
34	Find the nearest Z pulse position in the forward direction as the origin when starting
35	With the current position as the origin

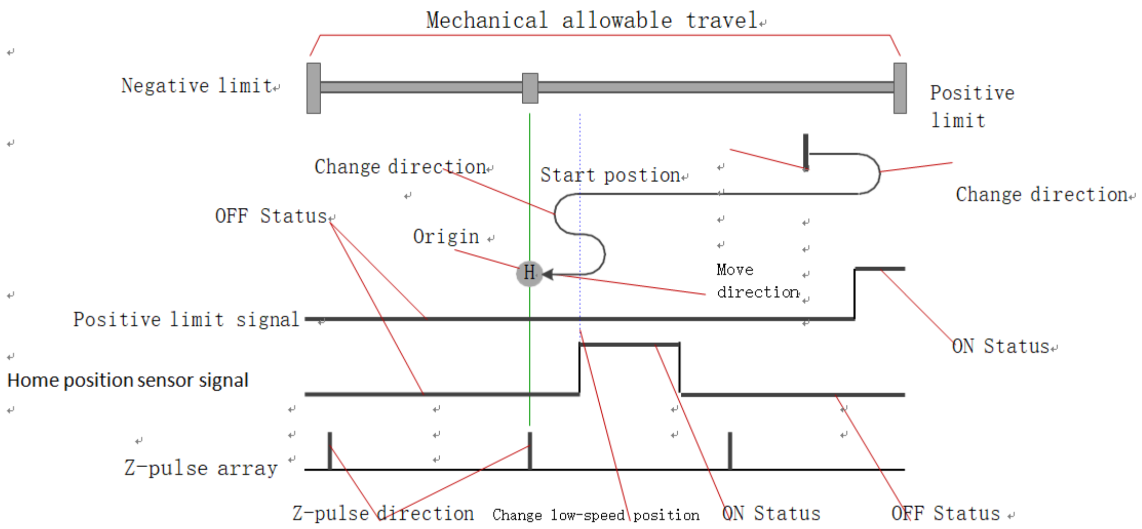


Chart 9-18Back to the original mode various icons meaning

In general, it is recommended that home modes 3 to 6 and 19 to 22 be applied to situations where the OFF/ON state of the HSW splits the entire mechanical allowable travel range into two parts, because these 8 modes stop and alarm whenever NL or PL is encountered, and do not automatically reverse to find the home point.

It is proposed to apply the origin modes 7~14 and 23~30 to the case where the ON state of HSW exactly divides the entire mechanical allowable travel range into three parts, when the ON state interval occupies only a small part of the entire mechanical allowable travel range (i.e., the ON state is a short-time transient).

The above is only a suggestion, not a mandate.

Mode 1, Looking for negative limits and Z pulses

If NL is invalid at the start, run in the negative direction at high speed, slow down and stop after encountering the OFF→ON state of NL, and then change to run in the positive direction at low speed.

After running in the positive direction at low speed and encountering the ON→OFF state of NL, continue to run in the positive direction to find the nearest Z pulse position as the home position. If NL is valid at the start, run at low speed toward the forward direction. After encountering the ON→OFF state of NL while running in the forward direction, continue to search for the nearest Z pulse position in the forward direction as the home position.

As 9-19 shown, See Table 8. Introduction to 26 Return to Original Mode.

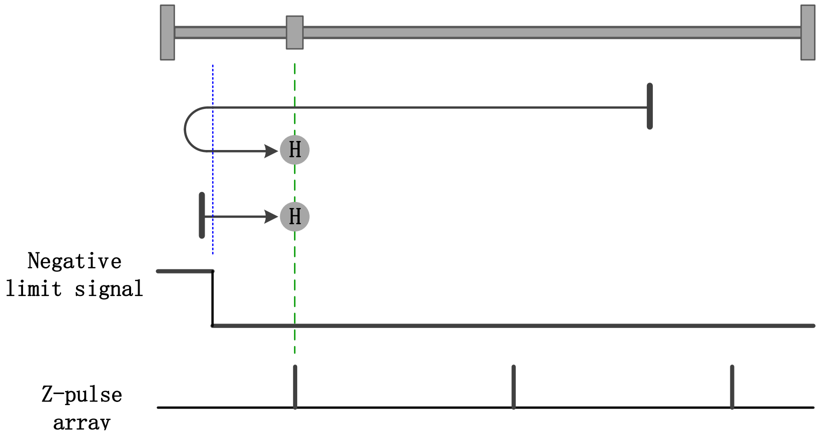


Chart 9-19 Origin mode 1 trajectory and signal state

Mode 2, Looking for positive limits and Z pulses

If the PL is invalid at the start, run in the positive direction at high speed, slow down and stop after encountering the OFF→ON state of the PL, and then change to run in the negative direction at low speed. After the PL ON→OFF state is encountered while running in the negative direction at low speed, continue to search for the nearest Z pulse position in the negative direction as the home position. If PL is valid at the start, run in the negative direction at a low speed. After encountering the ON→OFF state of PL while running in the negative direction, continue to search for the nearest Z pulse position in the negative direction as the home position.

As 9-20 shown, See Table 8. Introduction to 26 Return to Original Mode.

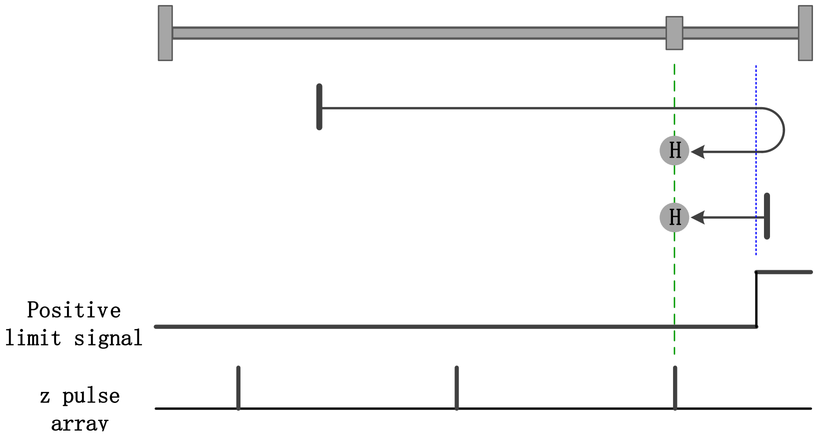


Chart 9-20 Origin mode 2 trajectory and signal state

Mode 3, Finding the ON→OFF position of HSW and Z pulse when running in the negative direction

If the HSW is invalid at the start, it runs in the positive direction at high speed, and then decelerates and stops after encountering the OFF→ON state of the HSW in the positive direction, and then changes to low speed and runs in the negative direction. When the HSW ON→OFF state is encountered in the negative direction at low speed, it continues to search for the nearest Z pulse position in the negative direction as the home position.

If HSW is active at the start, run at high speed in the negative direction. When the HSW is ON→OFF in the negative direction, decelerate and stop, then decelerate and stop again when the HSW is valid at high speed, and then change to low speed and run in the negative direction. After encountering the ON→OFF state of HSW in the negative direction at low speed, continue to search for the nearest Z pulse position in the negative direction as the home position.

This mode stops the return to home process and alarms, whether it encounters the ON state of NL or PL.

As 9-21 shown, See Table 8. Introduction to 26 Return to Original Mode.

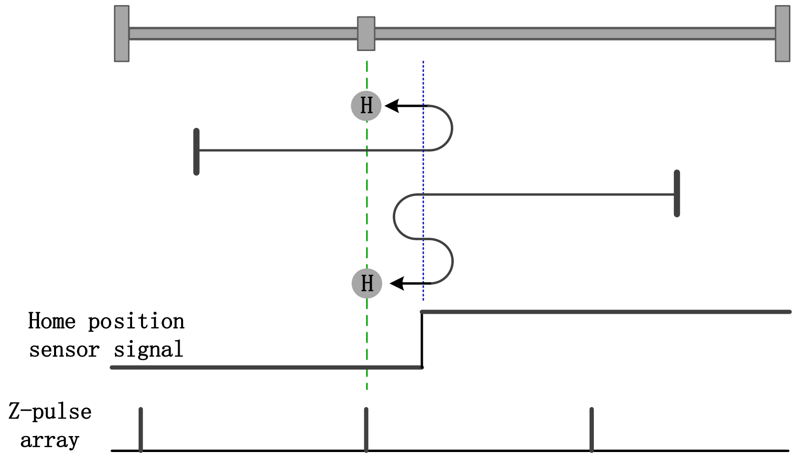


Chart 9-21 Origin mode 3 trajectory and signal state

Mode 4, Finding the OFF→ON position of HSW and Z pulse when running in the forward direction

If the HSW is invalid at the start, run in the forward direction at high speed, slow down and stop after encountering the OFF→ON state of HSW in the forward direction, then slow down and stop again after backing up to the invalid HSW position at high speed, and then change to run in the forward direction at low speed. After encountering the OFF→ON state of HSW during the low-speed forward operation, continue to find the nearest Z pulse position as the home position in the forward direction.

If HSW is active at the start, run at high speed in the negative direction. When the HSW is ON→OFF in the negative direction, decelerate and stop, and then change to low speed to run in the positive direction. When the HSW is OFF→ON at low speed in the positive direction, continue to find the nearest Z pulse position in the positive direction as the home position.

This mode stops the return to home process and alarms, whether it encounters the ON state of NL or PL.

As 9-22 shown, See Table 8. Introduction to 26 Return to Original Mode.

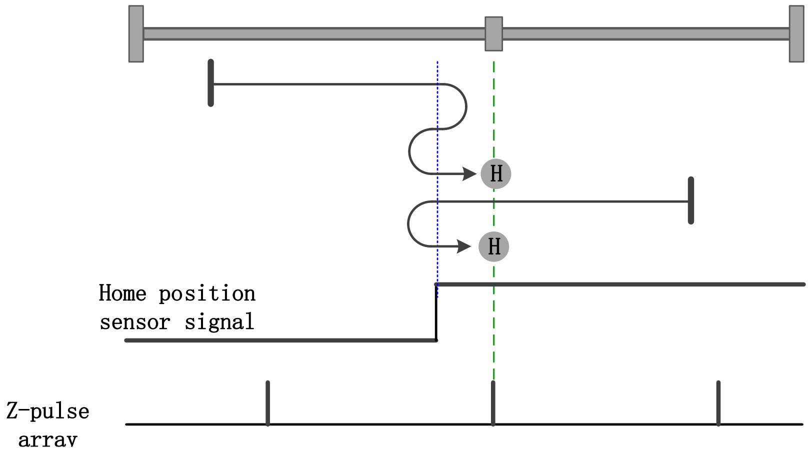


Chart 9-22 Origin mode 4 trajectory and signal state

Mode 5, Finding the ON→OFF position of HSW and Z pulse when running in the forward direction

If the HSW is invalid at the start, run in the negative direction at high speed. When the HSW is OFF→ON in the negative direction, decelerate and stop, and then change to low speed to run in the positive direction. When the HSW ON→OFF state is encountered in the low-speed forward operation, continue to find the nearest Z pulse position in the positive direction as the home position.

If the HSW is valid at the start, run in the forward direction at high speed, slow down and stop after encountering the ON→OFF state of the HSW in the forward direction, then slow down and stop again after retreating to the HSW valid position at high speed, and then change to run in the forward direction at low speed. After encountering the ON→OFF state of HSW during the low-speed forward operation, continue to find the nearest Z pulse position as the home position in the forward direction.

This mode stops the return to home process and alarms, whether it encounters the ON state of NL or PL.

As 9-23 shown, See Table 8. Introduction to 26 Return to Original Mode.

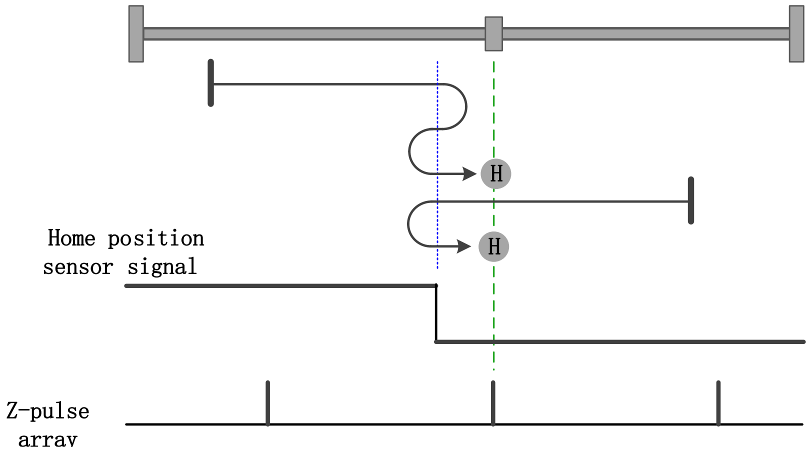


Chart 9-23 Origin mode 5 trajectory and signal shape

Mode 6, Looking for the OFF→ON position of HSW and Z pulse when running in the negative direction

If the HSW is invalid at the start, run in the negative direction at high speed. When the HSW is OFF→ON during negative direction operation, decelerate and stop, then decelerate and stop again after retreating to the HSW invalid position at high speed, and then change to low speed to run in the negative direction. After encountering the OFF→ON state of HSW in the negative direction at low speed, continue to find the nearest Z pulse position as the home position in the negative direction.

If the HSW is valid at the start, run in the positive direction at high speed, and then slow down and stop after encountering the ON→OFF state of the HSW in the positive direction, and then change to low speed and run in the negative direction. When the HSW turns OFF→ON in the negative direction at low speed, continue to run in the negative direction and find the nearest Z pulse position as the home position.

This mode stops the return to home process and alarms, whether it encounters the ON state of NL or PL.

AsChart 9-24 shown, See Table 8. Introduction to 26 Return to Original Mode.

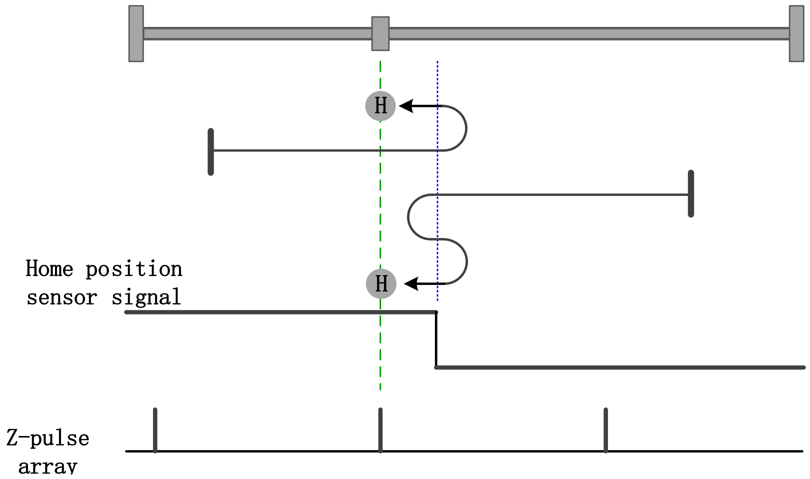


Chart 9-24 Origin mode 6 trajectory and signal state

Mode 7, Looking for the ON→OFF position and Z pulse of HSW when running in the negative direction, and automatically reversing when positive limit is encountered

If the HSW is invalid at the start and is on the positive side of the home position sensor, run at high speed in the positive direction, slow down and stop when it encounters the ON state of the PL, and then run at high speed in the negative direction. When running in the negative direction, decelerate and stop after encountering the ON→OFF state of HSW, then decelerate and stop again after retreating to the HSW valid position at high speed (if the HSW valid interval is narrow, it may enter the HSW invalid position interval on the other side), and then change to run in the negative direction at low speed. After encountering the ON→OFF state of HSW while running in the negative direction at low speed, continue to find the nearest Z pulse position in the negative direction as the home position.

If the HSW is invalid at the start and is on the negative side of the home position sensor, run in the positive direction at high speed, slow down and stop after encountering the OFF→ON state of the HSW in the positive direction, and then change to low speed and run in the negative direction. After encountering the ON→OFF state of HSW in the negative direction at low speed, continue to find the nearest Z pulse position in the negative direction as the home position.

If the HSW is valid at the start, run at high speed in the negative direction. When running in the negative direction, slow down and stop after encountering the ON→OFF state of HSW, then slow down and stop again after retreating to the HSW valid position at high speed (if the HSW valid interval is narrow, it may enter the HSW invalid position interval on the other side), and then change to low speed to run in the negative direction. After encountering the ON→OFF state of HSW while running in the negative direction at low speed, continue to find the nearest Z pulse position in the negative direction as the home position.

In this mode, the first time the ON state of PL is encountered towards forward operation is automatically reversed; when the ON state of NL is encountered, or when the ON state of PL is encountered again, the flow back to the home position is stopped and an alarm is sounded.

AsChart 9-25 shown, See Table 8. Introduction to 26 Return to Original Mode.

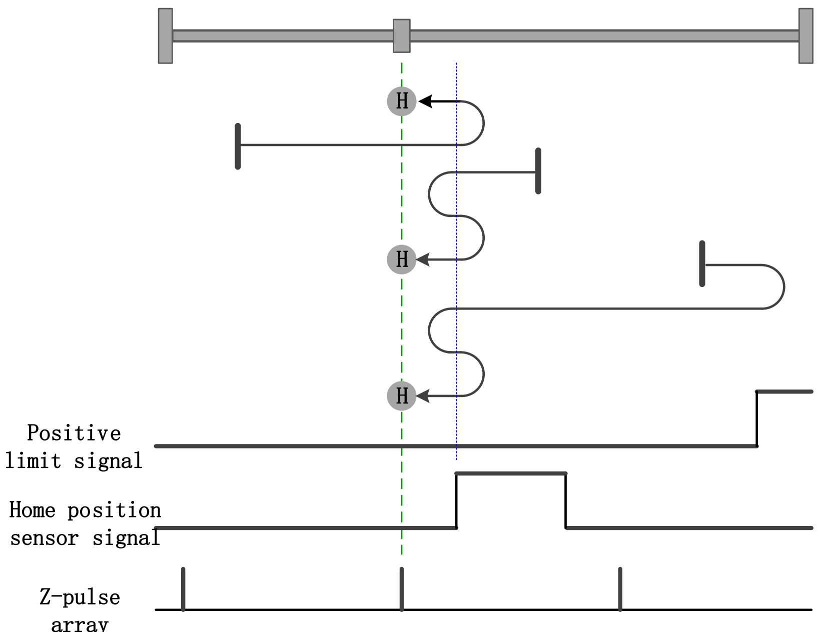


Chart 9-25 Origin mode 7 trajectory and signal state

Mode 8, Find the OFF→ON position and Z pulse of HSW when running in the forward direction, and automatically reverse when positive limit is encountered

If the HSW is invalid at the start and is on the positive side of the home position sensor, run in the positive direction at high speed, decelerate and stop when it encounters the ON state of the PL, and then run in the negative direction at high speed. When the negative direction operation encounters the ON→OFF state of HSW, decelerate and stop, and then change to the low speed operation towards the positive direction. After encountering the OFF→ON state of HSW while running in the positive direction at low speed, continue to search for the nearest Z pulse position as the home position in the positive direction.

If the HSW is invalid at the start and is on the negative side of the home position sensor, run in the forward direction at high speed, and then slow down and stop after encountering the OFF→ON state of the HSW in the forward direction, then slow down and stop again after backing up to the invalid HSW position at high speed, and then change to run in the forward direction at low speed. After encountering the OFF→ON state of HSW while running in the forward direction at low speed, continue to search for the nearest Z pulse position in the forward direction as the home position.

If HSW is active at the start, run at high speed in the negative direction. When the HSW is ON→OFF in the negative direction, decelerate and stop, and then change to low speed to run in the positive direction. When the HSW OFF→ON state is encountered in the low-speed forward operation, continue to search for the nearest Z pulse position in the positive direction as the home position.

In this mode, the first time the ON state of PL is encountered towards forward operation is automatically reversed; when the ON state of NL is encountered, or when the ON state of PL is encountered again, the flow back to the home position is stopped and an alarm is generated.

AsChart 9-26 shown, See Table 8. Introduction to 26 Return to Original Mode.

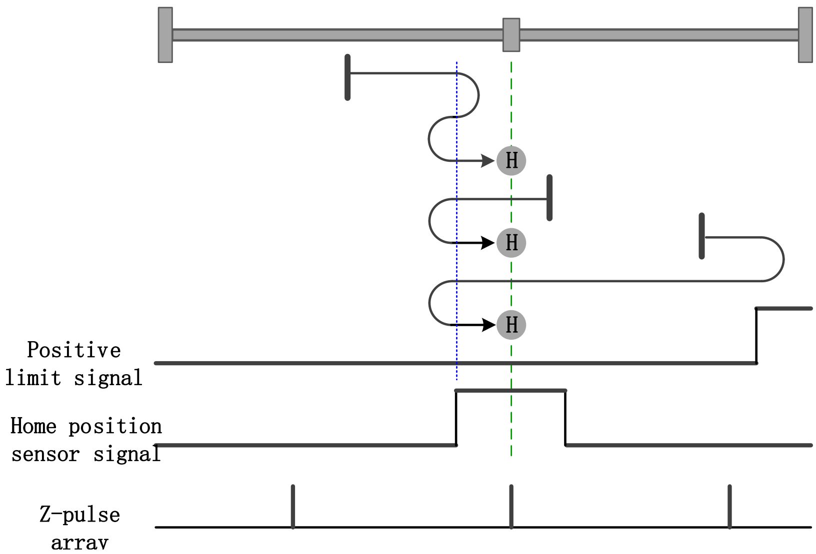


Chart 9-26 Origin mode 8 trajectory and signal state

Mode 9, Looking for the OFF→ON position and Z pulse of HSW when running in the negative direction, and automatically reversing when positive limit is encountered

If the HSW is invalid at the start and is on the positive side of the home position sensor, run in the positive direction at high speed, slow down and stop when the PL is ON, and then run in the negative direction at high speed. When the negative direction operation encounters the OFF→ON state of HSW, decelerate and stop, then decelerate and stop again after retreating to the position where HSW is invalid at high speed, and then change to low speed operation towards the negative direction. After encountering the OFF→ON state of HSW while running in the negative direction at low speed, continue to find the nearest Z pulse position in the negative direction as the home position.

If the HSW is invalid at the start and is on the negative side of the home position sensor, run in the positive direction at high speed, slow down and stop after encountering the ON→OFF state of the HSW in the positive direction, and then change to low speed and run in the negative direction. After encountering the OFF→ON state of HSW in the negative direction at low speed, continue to find the nearest Z pulse position in the negative direction as the home position.

If HSW is active at the start, run at high speed in the positive direction. When the HSW ON→OFF state is encountered in the positive direction, decelerate and stop, and then change to low speed to run in the negative direction. When the HSW is OFF→ON at low speed in negative direction, continue to find the nearest Z pulse position as the home position in negative direction.

In this mode, the first time the ON state of PL is encountered towards forward operation is automatically reversed; when the ON state of NL is encountered, or when the ON state of PL is encountered again, the flow back to the home position is stopped and an alarm is sounded.

AsChart 9-27 shown, See Table 8. Introduction to 26 Return to Original Mode.

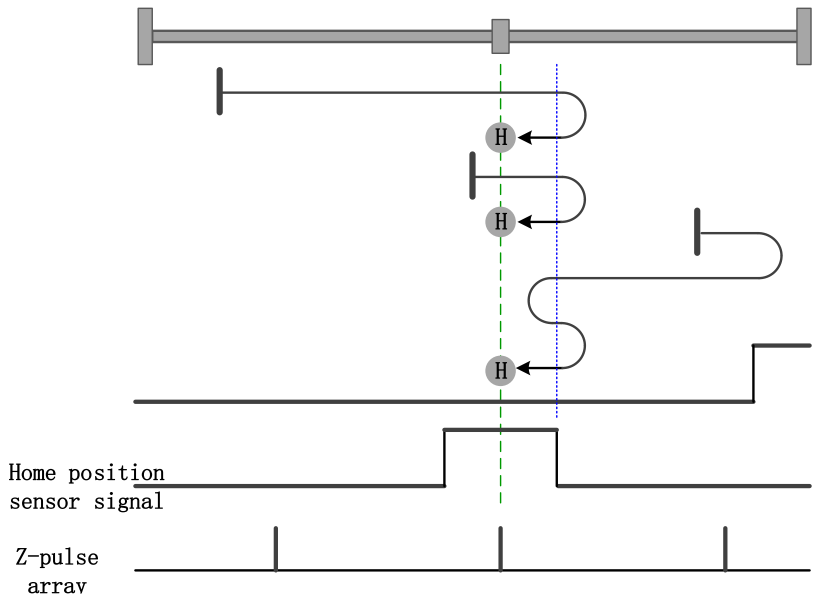


Chart 9-27 Origin mode 9 trajectory and signal state

Mode 10, Find the ON→OFF position and Z pulse of HSW when running in the forward direction, and automatically reverse when positive limit is encountered

If the HSW is invalid at the start and is on the positive side of the home position sensor, run at high speed in the positive direction, decelerate and stop when it encounters the ON state of the PL, and then run at high speed in the negative direction. When the negative direction operation encounters the OFF→ON state of HSW, decelerate and stop, and then switch to the low speed operation towards the positive direction. After encountering the ON→OFF state of HSW while running in the positive direction at low speed, continue to find the nearest Z pulse position as the home position in the positive direction.

If the HSW is invalid at the start and is on the negative side of the home position sensor, run in the forward direction at high speed, slow down and stop after encountering the ON→OFF state of the HSW in the forward direction, then slow down and stop again after returning to the valid HSW position at high speed (if the valid HSW range is narrow, it may enter the invalid HSW range on the other side), and then change to low speed and run in the forward direction. After that, change to low speed towards forward. After encountering the ON→OFF state of HSW during the low-speed forward operation, continue to find the nearest Z pulse position as the home position in the forward direction.

If the HSW is valid at the start, run at high speed in the forward direction. When the HSW ON→OFF state is encountered during forward operation, decelerate and stop, and then decelerate and stop again after retreating to the HSW valid position at high speed (if the HSW valid interval is narrow, it may enter the HSW invalid position interval on the other side), and then change to low speed to run in the forward direction. After encountering the ON→OFF state of HSW while running in the forward direction at low speed, continue to find the nearest Z pulse position in the forward direction as the home position.

In this mode, the first time the ON state of PL is encountered towards forward operation is automatically reversed; when the ON state of NL is encountered, or when the ON state of PL is encountered again, the flow back to the home position is stopped and an alarm is sounded.

AsChart 9-28 shown, See Table 8. Introduction to 26 Return to Original Mode.

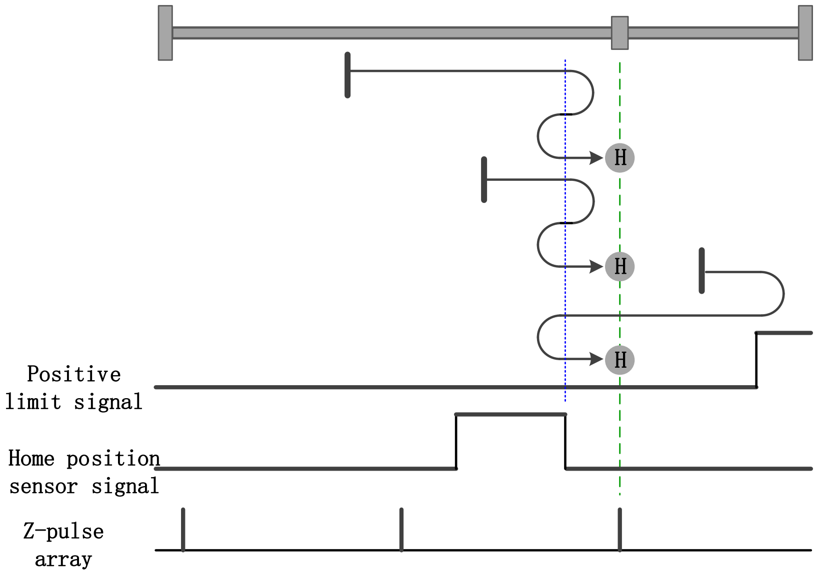


Chart 9-28 Origin mode 10 trajectory and signal state

Mode 11, Find the ON→OFF position and Z pulse of HSW when running in the positive direction, and automatically reverse when negative limit is encountered

If the HSW is invalid at the start and is located on the positive side of the home position sensor, run in the negative direction at high speed, slow down and stop after encountering the OFF→ON state of the HSW in the negative direction, and then change to low speed and run in the positive direction. After encountering the ON→OFF state of HSW at low speed in the positive direction, continue to find the nearest Z pulse position as the home position in the positive direction.

If the HSW is invalid at the start and is on the negative side of the home position sensor, run at high speed in the negative direction, slow down and stop when it encounters the ON state of NL, and then run at high speed in the positive direction. When running in the positive direction, slow down and stop after encountering the ON→OFF state of HSW, then slow down and stop again after retreating to the valid HSW position at high speed (if the valid HSW interval is narrow, it may enter the position interval of the invalid HSW on the other side), and then change to run in the positive direction at low speed. After encountering the ON→OFF state of HSW while running in the forward direction at low speed, continue to find the nearest Z pulse position in the forward direction as the home position.

If the HSW is valid at the start, run at high speed in the forward direction. When the HSW ON→OFF state is encountered during forward operation, decelerate and stop, and then decelerate and stop again after retreating to the HSW valid position at high speed (if the HSW valid interval is narrow, it may enter the HSW invalid position interval on the other side), and then change to low speed to run in the forward direction. After encountering the ON→OFF state of HSW while running in the forward direction at low speed, continue to find the nearest Z pulse position in the forward direction as the home position.

In this mode, operation in the negative direction is automatically reversed the first time the ON state of NL is encountered; when the ON state of PL is encountered, or when the ON state of NL is encountered again, the flow back to the origin is stopped and an alarm is sounded.

AsChart 9-29 shown, See Table 8. Introduction to 26 Return to Original Mode.

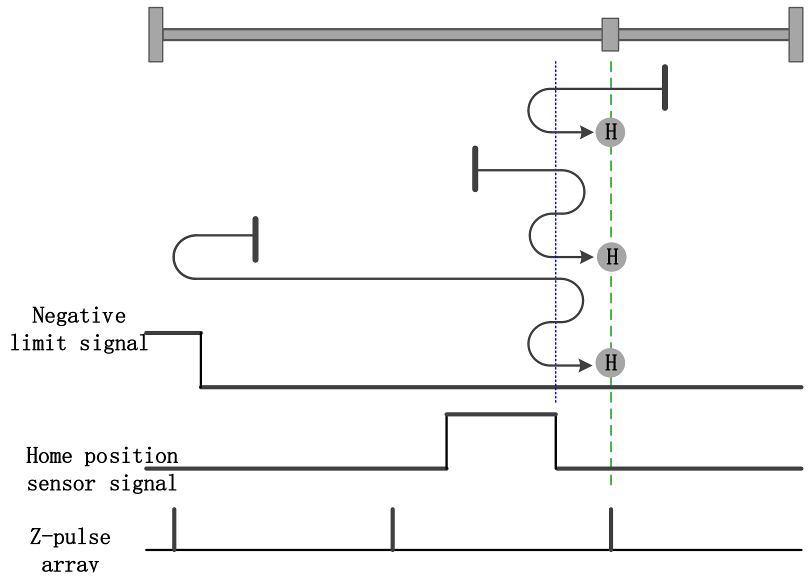


Chart 9-29 Origin mode 11 trajectory and signal state

Mode 12, Find the OFF→ON position and Z pulse of HSW when running in the negative direction, and automatically reverse when negative limit is encountered

If the HSW is invalid at the start and is located on the positive side of the home position sensor, run in the negative direction at high speed, slow down and stop after encountering the OFF→ON state of the HSW in the negative direction, then slow down and stop again after backing up to the invalid HSW position at high speed, and then change to run in the negative direction at low speed. After encountering the OFF→ON state of HSW when running in the negative direction at low speed, continue to find the nearest Z pulse position in the negative direction as the home position.

If the HSW is invalid at the start and is on the negative side of the home position sensor, run at high speed in the negative direction, slow down and stop when it encounters the ON state of NL, and then run at high speed in the positive direction. When it encounters the ON→OFF state of HSW while running in the positive direction, decelerate and stop, and then change to low speed to run in the negative direction. After encountering the OFF→ON state of HSW while running in the negative direction at low speed, continue to find the nearest Z pulse position in the negative direction as the home position.

If HSW is active at the start, run at high speed in the positive direction. When the HSW ON→OFF state is encountered in the positive direction, decelerate and stop, and then change to low speed to run in the negative direction. When the HSW is OFF→ON at low speed in negative direction, continue to find the nearest Z pulse position as the home position in negative direction.

In this mode, operation in the negative direction is automatically reversed the first time the ON state of NL is encountered; when the ON state of PL is encountered, or when the ON state of NL is encountered again, the flow back to the origin is stopped and an alarm is sounded.

AsChart 9-30 shown, See Table 8. Introduction to 26 Return to Original Mode.

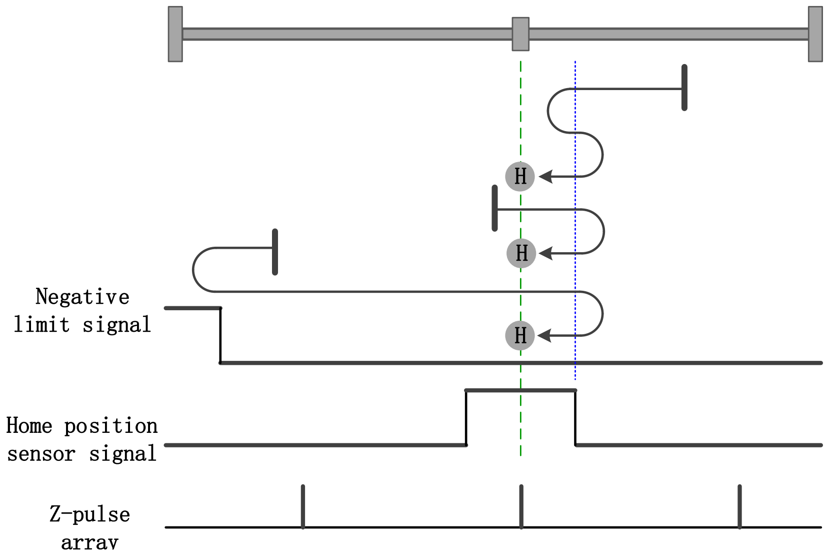


Chart 9-30 Origin mode 12 trajectory and signal state

Mode 13, Find the OFF→ON position and Z pulse of HSW when running in the positive direction, and automatically reverse when negative limit is encountered

If the HSW is invalid at the start and is located on the positive side of the home position sensor, run in the negative direction at high speed, slow down and stop after encountering the ON→OFF state of the HSW in the negative direction, and then change to low speed and run in the positive direction. After encountering the OFF→ON state of HSW during the low-speed forward operation, continue to find the nearest Z pulse position as the home position in the forward direction.

If the HSW is invalid at the start and is on the negative side of the home position sensor, run in the negative direction at high speed, slow down and stop when it encounters the ON state of NL, and then run in the positive direction at high speed. When it encounters the OFF→ON state of HSW during forward operation, it decelerates and stops, and then decelerates and stops again after returning to the position where HSW is invalid at high speed, and then changes to low speed to run in the positive direction. After encountering the OFF→ON state of HSW while running in the forward direction at low speed, continue to find the nearest Z pulse position in the forward direction as the home position.

If HSW is active at the start, run at high speed in the negative direction. When the HSW is ON→OFF in the negative direction, decelerate and stop, and then change to low speed to run in the positive direction. When the HSW is OFF→ON at low speed in the positive direction, continue to find the nearest Z pulse position in the positive direction as the home position.

In this mode, operation in the negative direction is automatically reversed the first time the ON state of NL is encountered; when the ON state of PL is encountered, or when the ON state of NL is encountered again, the flow back to the origin is stopped and an alarm is sounded.

AsChart 9-31 shown, See Table 8. Introduction to 26 Return to Original Mode.

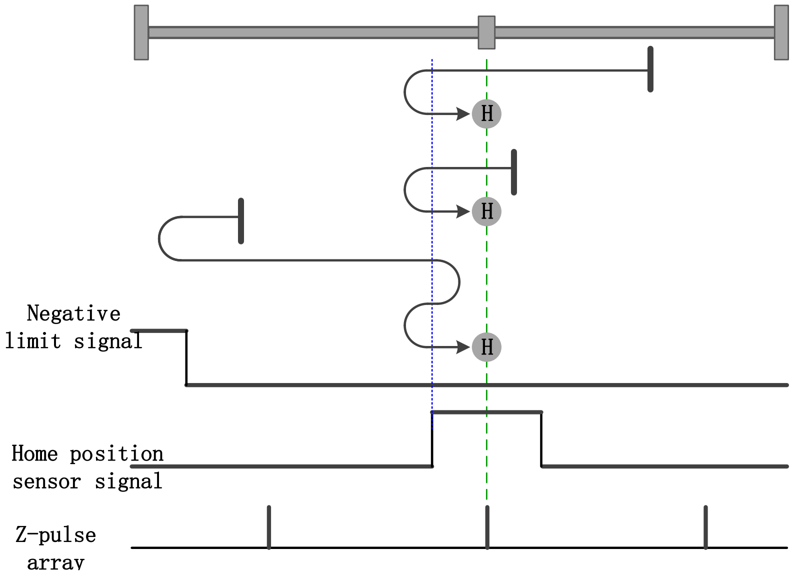


Chart 9-31 Origin mode 13 trajectory and signal state

Mode 14, Find the ON→OFF position and Z pulse of HSW when running in the negative direction, and automatically reverse when negative limit is encountered

If the HSW is invalid at the start and is on the positive side of the home position sensor, run at high speed in the negative direction, then slow down and stop after encountering the ON→OFF state of the

HSW in the negative direction, then slow down and stop again after returning to the HSW valid position at high speed (if the HSW valid range is narrow, it may enter the HSW invalid range on the other side), then change to low speed and run in the negative direction. After that, change to low speed towards negative direction. After encountering the ON→OFF state of HSW when running in the negative direction at low speed, continue to find the nearest Z pulse position in the negative direction as the home position.

If the HSW is invalid at the start and is on the negative side of the home position sensor, run at high speed in the negative direction, slow down and stop when it encounters the ON state of NL, and then run at high speed in the positive direction. When it encounters the OFF→ON state of HSW while running in the positive direction, decelerate and stop, and then change to low speed to run in the negative direction. After encountering the ON→OFF state of HSW while running in the negative direction at low speed, continue to find the nearest Z pulse position in the negative direction as the home position.

If the HSW is valid at the start, run at high speed in the negative direction. When running in the negative direction, slow down and stop after encountering the ON→OFF state of HSW, then slow down and stop again after retreating to the HSW valid position at high speed (if the HSW valid interval is narrow, it may enter the HSW invalid position interval on the other side), and then change to low speed to run in the negative direction. After encountering the ON→OFF state of HSW while running in the negative direction at low speed, continue to find the nearest Z pulse position in the negative direction as the home position.

This mode automatically reverses the first time the ON state of NL is encountered when running in the negative direction; when the ON state of PL is encountered, or when the ON state of NL is encountered again, the return home process is stopped and an alarm is generated.

AsChart 9-32 shown, See Table 8. Introduction to 26 Return to Original Mode.

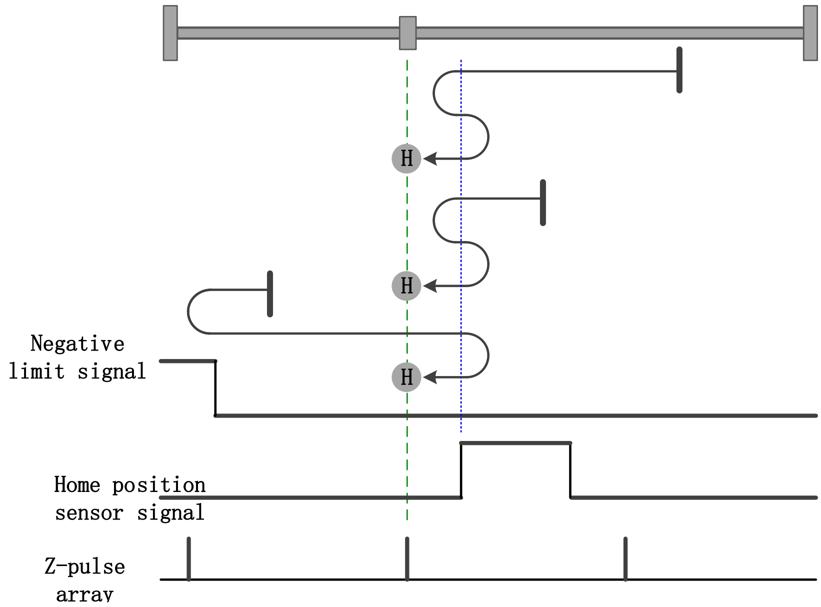


Chart 9-32 Origin mode 14 trajectory and signal state

Mode 15, Reserved, please do not set.

Mode 16, Reserved, please do not set.

Mode 17, Finding Negative Limits

If NL is invalid at the start, run in the negative direction at high speed, decelerate and stop when it encounters the OFF→ON state of NL, and then change to run in the positive direction at low speed. Decelerate and stop when running at low speed toward positive direction and meet the ON→OFF state of NL, and use the stop position as the home position.

If NL is valid at the start, run at low speed toward the forward direction. Decelerate and stop at the ON→OFF state of NL encountered in forward operation, using the stop position as the home position.

AsChart 9-33 shown, See Table 8. Introduction to 26 Return to Original Mode.

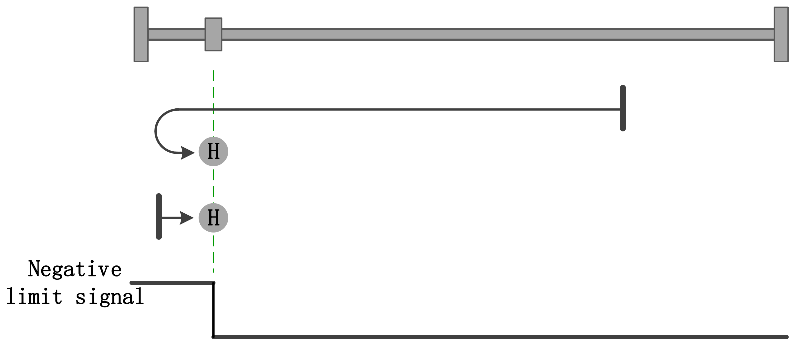


Chart 9-33 Origin mode 17 trajectory and signal state

Mode 18, Finding Positive Limits

If PL is invalid at the start, run in the positive direction at high speed, decelerate and stop when it encounters the OFF→ON state of PL, and then change to run in the negative direction at low speed. When the low speed running in the negative direction encounters the ON→OFF state of PL, decelerate and stop, and use the stop position as the home position.

If PL is active at the start, run at low speed in the negative direction. When running at low speed in the negative direction, deceleration stops when the ON→OFF state of PL is encountered, and the stop position is used as the home position.

AsChart 9-34 shown, See Table 8. Introduction to 26 Return to Original Mode.

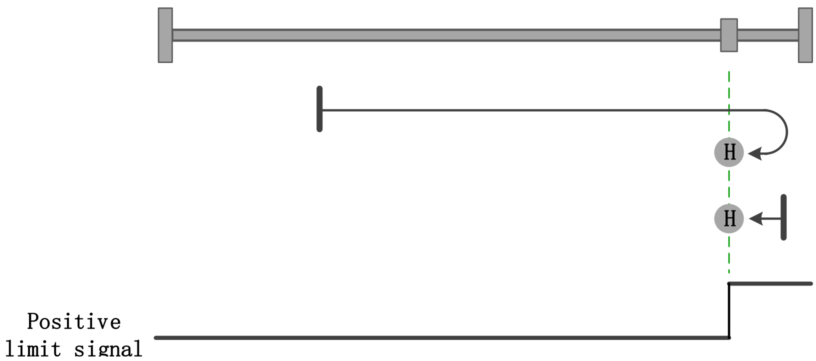


Chart 9-34 Origin mode 18 trajectory and signal state

Mode 19, Find the ON→OFF position of HSW when running in the negative direction

If the HSW is invalid at the start, it runs in the positive direction at high speed, and then decelerates and stops when it encounters the OFF→ON state of the HSW in the positive direction, and then changes to low speed and runs in the negative direction. When the HSW ON→OFF state is encountered in the negative direction at low speed, decelerate and stop, and use the stop position as the home position.

If HSW is active at the start, it runs in the negative direction at high speed. After decelerating and stopping in the negative direction when the HSW ON→OFF state is encountered, then decelerating and stopping again after returning to the HSW valid position at high speed, and then switching to low speed to run in the negative direction. When the negative direction operation at low speed encounters the ON→OFF state of HSW, decelerate and stop, using the stop position as the home position. In this mode, whether it encounters the ON state of NL or PL, it is stopped back to the home process and alarmed. AsChart 9-35 shown, See Table 8. Introduction to 26 Return to Original Mode.

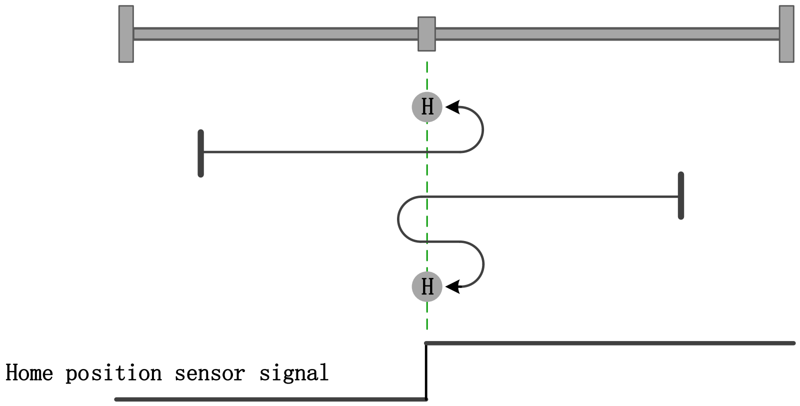


Chart 9-35 Origin mode 19 trajectory and signal state

Mode 20, Find the OFF→ON position of HSW when running in the forward direction

If the HSW is invalid at the start, run in the forward direction at high speed, and then decelerate and stop when the HSW OFF→ON state is encountered in the forward direction, and then decelerate and stop again when the HSW is invalid at high speed, and then change to low speed and run in the forward direction. When the low-speed forward operation encounters the OFF→ON state of HSW, decelerate and stop, and use the stop position as the home position.

If HSW is active at the start, run at high speed in the negative direction. When the HSW ON→OFF state is encountered in the negative direction, deceleration is stopped, and then the speed is changed to low speed to run in the positive direction. Decelerate and stop when the low-speed forward operation encounters the OFF→ON state of HSW, and use the stop position as the home position.

This mode stops the return to home process and alarms, whether it encounters the ON state of NL or PL.

AsChart 9-36 shown, See Table 8. Introduction to 26 Return to Original Mode.

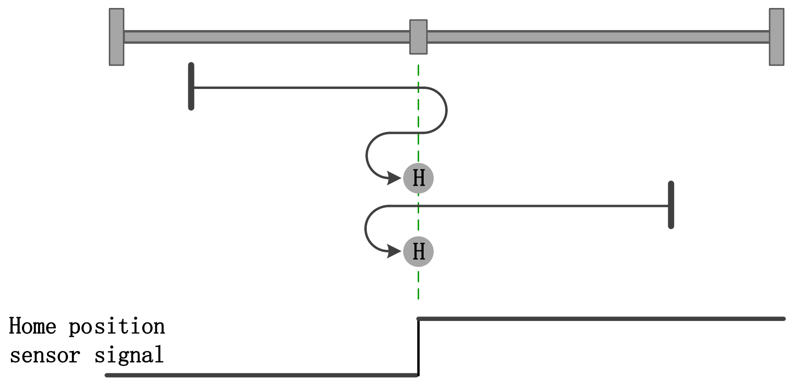


Chart 9-36 Origin mode 20 trajectory and signal state

Mode 21, Find the ON→OFF position of HSW when running in the forward direction

If the HSW is invalid at the start, run in the negative direction at high speed. After decelerating and stopping when the HSW OFF→ON state is encountered in the negative direction, the speed is switched to low speed to run in the positive direction. Decelerate and stop when the low-speed forward operation meets the ON→OFF state of HSW, and use the stop position as the home position.

If the HSW is active at the start, it runs in the forward direction at high speed, decelerates and stops when it encounters the ON→OFF state of the HSW in the forward direction, then decelerates and stops again when it returns to the active HSW position at high speed, and then changes to low speed to run in the forward direction. When the low-speed forward operation encounters the ON→OFF state of HSW, decelerate and stop, and use the stop position as the home position.

This mode stops the return to home process and alarms, whether it encounters the ON state of NL or PL.

AsChart 9-37 shown, See Table 8. Introduction to 26 Return to Original Mode.

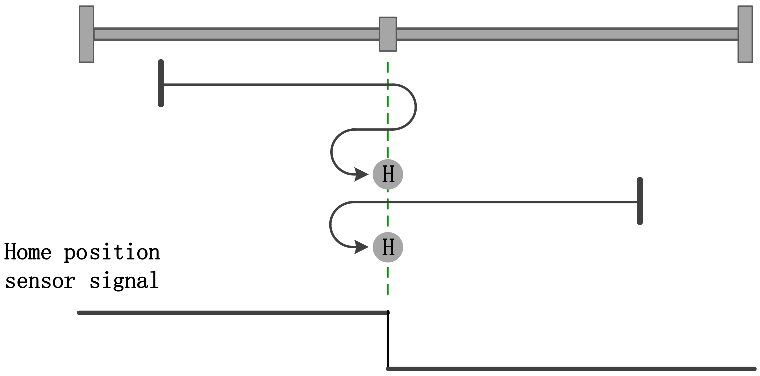


Chart 9-37 Origin mode 21 trajectory and signal state

Mode 22, Looking for the OFF→ON position of HSW when operating in the negative direction

If the HSW is invalid at the start, run in the negative direction at high speed. When the HSW OFF→ON state is encountered in the negative direction, deceleration is stopped, and then deceleration is stopped again when the HSW OFF→ON state is encountered in the negative direction, and then the HSW OFF→ON state is encountered in the negative direction. When the negative direction operation at low speed encounters the OFF→ON state of HSW, decelerate and stop, and use the stop position as the home position.

If the HSW is active at the start, it runs in the positive direction at high speed, and then decelerates and stops when it encounters the ON→OFF state of the HSW in the positive direction, and then changes to low speed and runs in the negative direction. When the HSW OFF→ON state is encountered in the negative direction at low speed, decelerate and stop, and use the stop position as the home position.

This mode stops the return to home process and alarms, whether it encounters the ON state of NL or PL.

AsChart 9-38 shown, See Table 8. Introduction to 26 Return to Original Mode.

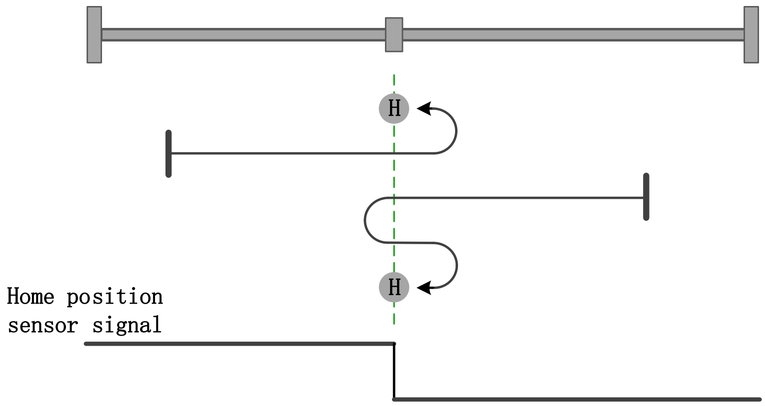


Chart 9-38 Origin mode 22 trajectory and signal state

Mode 23, Looking for the ON→OFF position of HSW when running in the negative direction, and automatically reversing when positive limit is encountered

If the HSW is invalid at the start and is on the positive side of the home position sensor, run at high speed in the positive direction, slow down and stop when it encounters the ON state of the PL, and then run at high speed in the negative direction. In the negative direction, decelerate and stop after encountering the ON→OFF state of HSW, then decelerate and stop again after retreating to the valid HSW position at high speed (if the valid HSW interval is narrow, it may enter the position interval of the invalid HSW on the other side), and then change to low speed to run in the negative direction. Decelerate and stop when the low-speed negative operation meets the ON→OFF of HSW, using the stop position as the home position.

If the HSW is invalid at the start and is on the negative side of the home position sensor, run at high speed in the positive direction, decelerate and stop when the HSW OFF→ON state is encountered in the positive direction, and then change to low speed and run in the negative direction. When the negative direction operation at low speed encounters the ON→OFF state of HSW, decelerate and stop, and use the stop position as the home position.

If the HSW is valid at the start, run at high speed in the negative direction. When running in the negative direction, decelerate and stop after encountering the ON→OFF state of HSW, then decelerate and stop again after retreating to the HSW valid position at high speed (if the HSW valid interval is narrow, it may enter the HSW invalid position interval on the other side), and then change to low speed to run in the negative direction. Decelerate and stop when the low-speed negative operation meets the ON→OFF of HSW, using the stop position as the home position.

In this mode, the first time the ON state of PL is encountered towards forward operation is automatically reversed; when the ON state of NL is encountered, or when the ON state of PL is encountered again, the flow back to the home position is stopped and an alarm is generated.

AsChart 9-39 shown, See Table 8. Introduction to 26 Return to Original Mode.

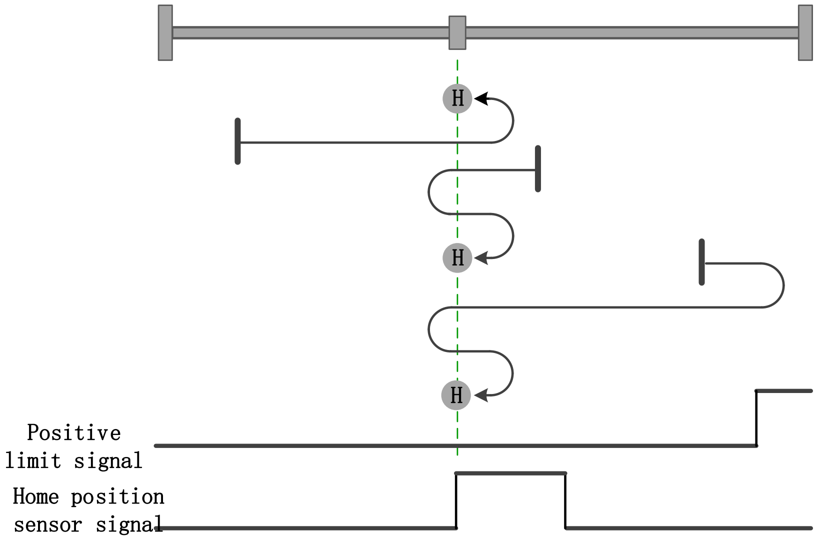


Chart 9-39 Origin mode 23 trajectory and signal state

Mode 24, Looking for the OFF→ON position of HSW when running in the forward direction, and automatically reversing when positive limit is encountered

If the HSW is invalid at the start and is on the positive side of the home position sensor, run in the positive direction at high speed, decelerate and stop when it encounters the ON state of the PL, and then run in the negative direction at high speed. When the negative direction operation encounters the ON→OFF state of HSW, decelerate and stop, and then change to the low speed operation towards the positive direction. Decelerate and stop when the low-speed forward operation encounters the OFF→ON state of HSW, and use the stop position as the home position.

If the HSW is invalid at the start and is on the negative side of the home position sensor, run in the forward direction at high speed, decelerate and stop when the HSW OFF→ON state is encountered in the forward direction, then decelerate and stop again when the HSW is invalid at high speed, and then run in the forward direction at low speed. When the low-speed forward operation encounters the OFF→ON state of HSW, decelerate and stop, and use the stop position as the home position.

If HSW is active at the start, run at high speed in the negative direction. When the HSW ON→OFF state is encountered in the negative direction, deceleration is stopped, and then the speed is changed to low speed to run in the positive direction. Decelerate and stop when the low-speed forward operation encounters the OFF→ON state of HSW, and use the stop position as the home position.

In this mode, the first time the ON state of PL is encountered towards forward operation is automatically reversed; when the ON state of NL is encountered, or when the ON state of PL is encountered again, the flow back to the home position is stopped and an alarm is generated.

AsChart 9-40 shown, See Table 8. Introduction to 26 Return to Original Mode.

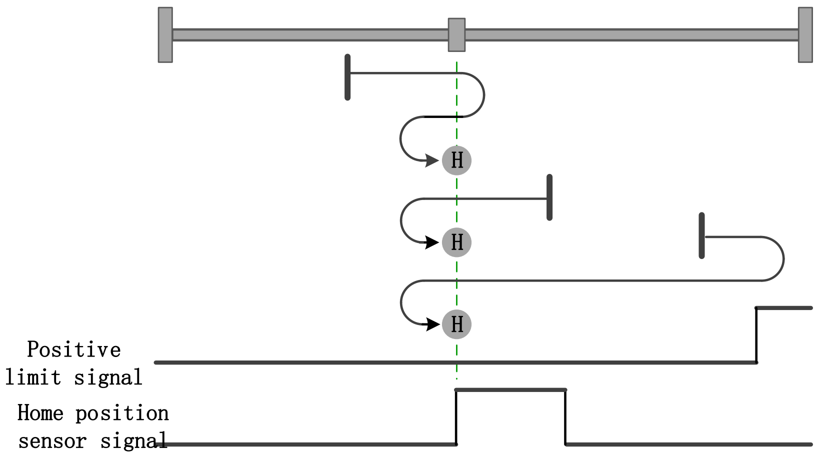


Chart 9-40 Origin mode 24 trajectory and signal state

Mode 25, Looking for the OFF→ON position of HSW when running in the negative direction, and automatically reversing when positive limit is encountered

If the HSW is invalid at the start and is on the positive side of the home position sensor, run in the positive direction at high speed, slow down and stop when the PL is ON, and then run in the negative direction at high speed. When the negative direction operation encounters the OFF→ON state of HSW, decelerate and stop, then decelerate and stop again after retreating to the invalid HSW position at high speed, and then change to low speed operation towards the negative direction. Decelerate and stop when the HSW OFF→ON state is encountered while running in the negative direction at low speed, and use the stop position as the home position.

If the HSW is invalid at the start and is located on the negative side of the home position sensor, run at high speed in the positive direction, decelerate and stop when the ON→OFF state of the HSW is encountered in the positive direction, and then change to low speed and run in the negative direction. When the negative direction operation at low speed encounters the OFF→ON state of HSW, decelerate and stop, and use the stop position as the home position.

If HSW is active at the start, run at high speed in the positive direction. When the HSW ON→OFF state is encountered during forward operation, deceleration is stopped, and then low speed is switched to negative operation. Decelerate and stop when the HSW OFF→ON state is encountered in the negative direction at low speed, and use the stop position as the home position.

In this mode, the first time the ON state of PL is encountered towards forward operation is automatically reversed; when the ON state of NL is encountered, or when the ON state of PL is encountered again, the flow back to the home position is stopped and an alarm is sounded.

AsChart 9-41 shown, See Table 8. Introduction to 26 Return to Original Mode.

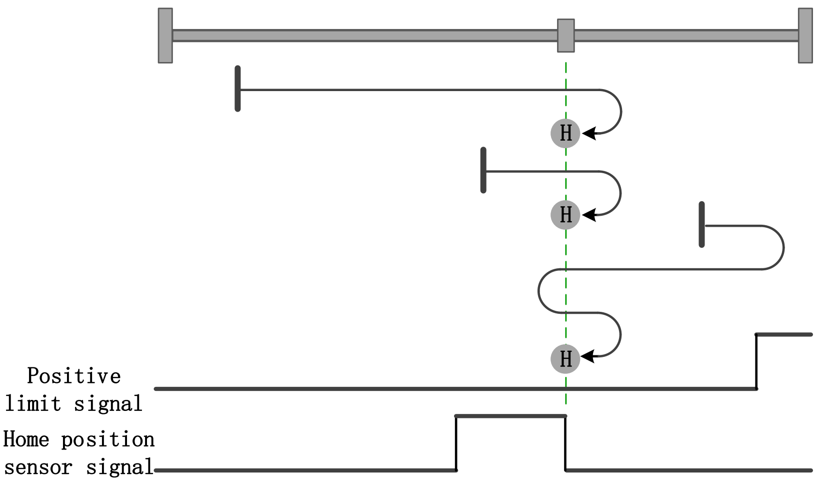


Chart 9-41 Origin mode 25 trajectory and signal state

Mode 26, Finding the ON→OFF position of HSW when running in the forward direction, and automatically reversing when positive limit is encountered

If the HSW is invalid at the start and is on the positive side of the home position sensor, run at high speed in the positive direction, decelerate and stop when it encounters the ON state of the PL, and then run at high speed in the negative direction. When the negative direction operation encounters the

OFF→ON state of HSW, decelerate and stop, and then switch to the low speed operation towards the positive direction. Decelerate and stop when the low-speed forward operation meets the ON→OFF state of HSW, and use the stop position as the home position.

If the HSW is invalid at the start and is on the negative side of the home position sensor, run in the forward direction at high speed, slow down and stop after encountering the ON→OFF state of the HSW in the forward direction, then slow down and stop again after returning to the valid HSW position at high speed (if the valid HSW range is narrow, it may enter the invalid HSW range on the other side), and then change to low speed and run in the forward direction. After that, change to low speed towards forward. Decelerate and stop when the low-speed forward operation meets the ON→OFF state of HSW, using the stop position as the home position.

If the HSW is valid at the start, run at high speed in the forward direction. After decelerating and stopping when the HSW ON→OFF state is encountered during forward operation, decelerate and stop again after retreating to the HSW valid position at high speed (if the HSW valid interval is narrow, it may enter the HSW invalid position interval on the other side), and then change to low speed to run in the forward direction. Decelerate and stop when the low-speed forward operation encounters the ON→OFF state of HSW, using the stop position as the home position.

In this mode, the first time the ON state of PL is encountered towards forward operation is automatically reversed; when the ON state of NL is encountered, or when the ON state of PL is encountered again, the flow back to the home position is stopped and an alarm is sounded.

AsChart 9-42 shown, See Table 8. Introduction to 26 Return to Original Mode.

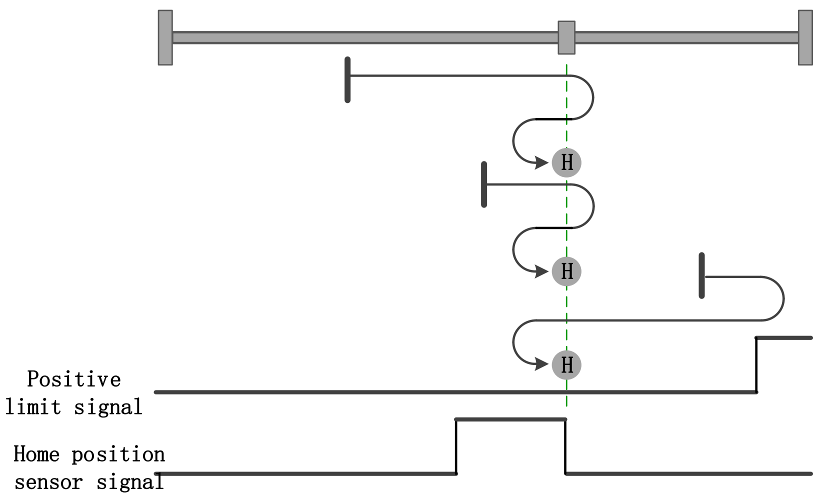


Chart 9-42 Origin mode 26 trajectory and signal state

Mode 27, Find the ON→OFF position of HSW when running in the positive direction, and automatically reverse when it meets the negative limit

If the HSW is invalid at the start and is on the positive side of the home position sensor, run at high speed in the negative direction, decelerate and stop when the HSW OFF→ON state is encountered in the negative direction, and then change to low speed and run in the positive direction. If the HSW ON→OFF state is encountered in low-speed forward operation, decelerate and stop, and use the stop position as the home position.

If the HSW is invalid at the start and is on the negative side of the home position sensor, run at high speed in the negative direction, slow down and stop when it encounters the ON state of NL, and then run at high speed in the positive direction. When running in the positive direction, slow down and stop after encountering the ON→OFF state of HSW, then slow down and stop again after retreating to the valid HSW position at high speed (if the valid HSW interval is narrow, it may enter the position interval of the invalid HSW on the other side), and then change to run in the positive direction at low speed. Decelerate and stop when the low-speed forward operation encounters the ON→OFF state of HSW, using the stop position as the home position.

If the HSW is valid at the start, run at high speed in the forward direction. After decelerating and stopping when the HSW ON→OFF state is encountered during forward operation, decelerate and stop again after retreating to the HSW valid position at high speed (if the HSW valid interval is narrow, it may enter the HSW invalid position interval on the other side), and then change to low speed to run in the forward direction. Decelerate and stop when the low-speed forward operation encounters the ON→OFF state of HSW, using the stop position as the home position.

In this mode, operation in the negative direction is automatically reversed the first time the ON state of NL is encountered; when the ON state of PL is encountered, or when the ON state of NL is encountered again, the flow back to the origin is stopped and an alarm is sounded.

AsChart 9-43 shown, See Table 8. Introduction to 26 Return to Original Mode.

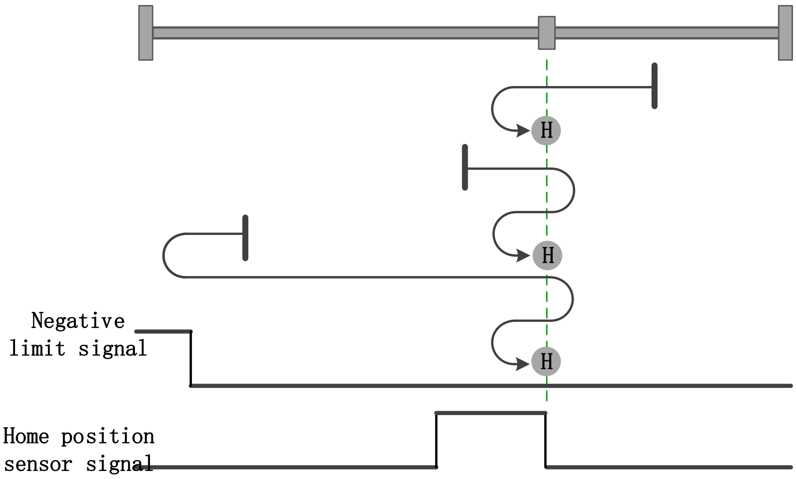


Chart 9-43 Origin mode 27 trajectory and signal state

Mode 28, Looking for the OFF→ON position of HSW when running in the negative direction, and automatically reversing when negative limit is encountered

If the HSW is invalid at the start and is located on the positive side of the home position sensor, run in the negative direction at high speed, decelerate and stop when the HSW OFF→ON state is encountered in the negative direction, then decelerate and stop again after retracing to the invalid HSW position at high speed, and then change to run in the negative direction at low speed. When the low-speed negative operation encounters the OFF→ON state of HSW, decelerate and stop, and use the stop position as the home position.

If the HSW is invalid at the start and is on the negative side of the home position sensor, run at high speed in the negative direction, slow down and stop when it encounters the ON state of NL, and then run at high speed in the positive direction. When it encounters the ON→OFF state of HSW while running in the positive direction, decelerate and stop, and then change to low speed to run in the negative direction. Decelerate and stop when the low-speed negative operation encounters the OFF→ON state of HSW, and use the stop position as the home position.

If HSW is active at the start, run at high speed in the positive direction. When the HSW ON→OFF state is encountered during forward operation, deceleration is stopped, and then low speed is switched to negative operation. Decelerate and stop when the HSW OFF→ON state is encountered in the negative direction at low speed, and use the stop position as the home position.

In this mode, operation in the negative direction is automatically reversed the first time the ON state of NL is encountered; when the ON state of PL is encountered, or when the ON state of NL is encountered again, the flow back to the origin is stopped and an alarm is sounded.

AsChart 9-44 shown, See Table 8. Introduction to 26 Return to Original Mode.

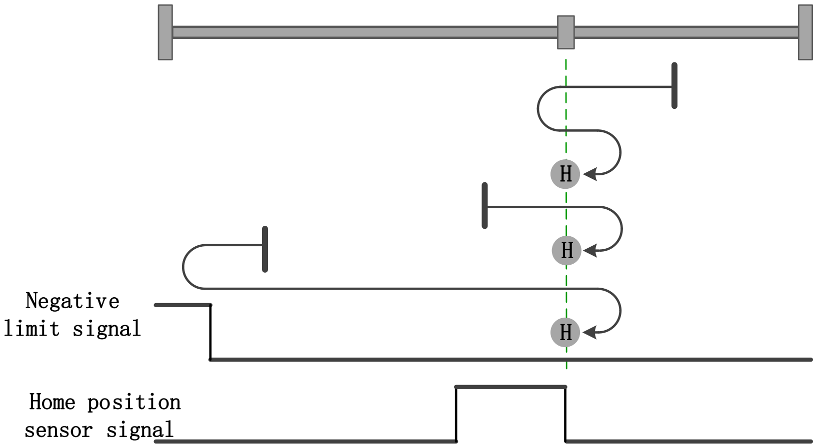


Chart 9-44 Origin mode 28 trajectory and signal state

Mode 29, Find the OFF→ON position of HSW when running in the positive direction, and automatically reverse when negative limit is encountered

If the HSW is invalid at the start and is on the positive side of the home position sensor, run at high speed in the negative direction, decelerate and stop when the HSW ON→OFF state is encountered in the negative direction, and then change to low speed and run in the positive direction. When the low speed positive operation meets the OFF→ON state of HSW, decelerate and stop, and use the stop position as the home position.

If the HSW is invalid at the start and is on the negative side of the home position sensor, run at high speed in the negative direction, slow down and stop when it encounters the ON state of NL, and then run at high speed in the positive direction. When it encounters the OFF→ON state of HSW in the forward direction, it decelerates and stops, and then decelerates and stops again when it returns to the position where HSW is invalid at high speed, and then changes to low speed to run in the forward direction. Decelerate and stop when the low-speed forward operation encounters the OFF→ON state of HSW, and use the stop position as the home position.

If HSW is active at the start, run at high speed in the negative direction. When the HSW ON→OFF state is encountered in the negative direction, deceleration is stopped, and then the speed is changed to low speed to run in the positive direction. Decelerate and stop when the low-speed forward operation encounters the OFF→ON state of HSW, and use the stop position as the home position.

In this mode, operation in the negative direction is automatically reversed the first time the ON state of NL is encountered; when the ON state of PL is encountered, or when the ON state of NL is encountered again, the flow back to the origin is stopped and an alarm is sounded.

AsChart 9-45 shown, See Table 8. Introduction to 26 Return to Original Mode.

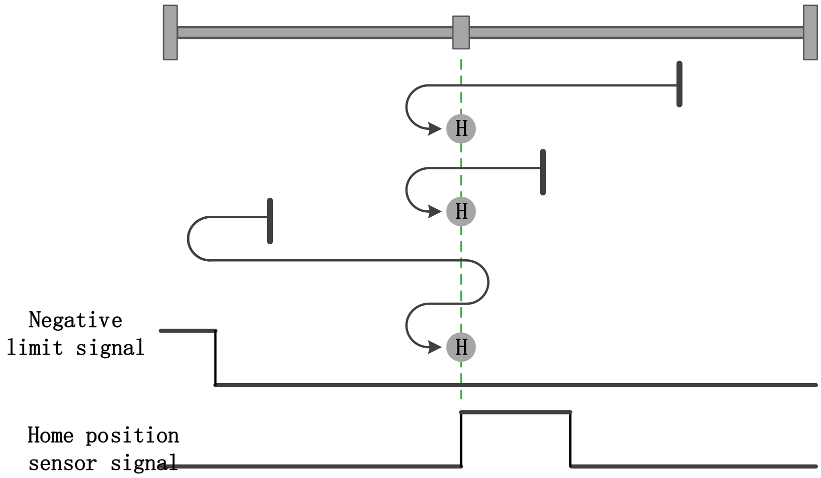


Chart 9-45 Origin mode 29 trajectory and signal state

Mode 30, Find the ON→OFF position of HSW when running in the negative direction, and automatically reverse when negative limit is encountered

If the HSW is invalid at the start and is on the positive side of the home position sensor, run at high speed in the negative direction, then slow down and stop after encountering the ON→OFF state of the HSW in the negative direction, then slow down and stop again after returning to the HSW valid position at high speed (if the HSW valid range is narrow, it may enter the HSW invalid range on the other side), then change to low speed and run in the negative direction. After that, change to low speed towards negative direction. Decelerate and stop when the low-speed negative operation meets the ON→OFF state of HSW, using the stop position as the home position.

If the HSW is invalid at the start and is on the negative side of the home position sensor, run at high speed in the negative direction, slow down and stop when it encounters the ON state of NL, and then run at high speed in the positive direction. When it encounters the OFF→ON state of HSW while running in the positive direction, decelerate and stop, and then change to low speed to run in the negative direction. Decelerate and stop when running in the negative direction at low speed and encounter the ON→OFF state of HSW, and use the stop position as the home position.

If the HSW is valid at the start, run at high speed in the negative direction. When running in the negative direction, decelerate and stop after encountering the ON→OFF state of HSW, then decelerate and stop again after retreating to the HSW valid position at high speed (if the HSW valid interval is narrow, it may enter the HSW invalid position interval on the other side), and then change to low speed to run in the negative direction. Decelerate and stop when low-speed negative operation encounters the ON→OFF state of HSW, using the stop position as the home position.

In this mode, operation in the negative direction is automatically reversed the first time the ON state of NL is encountered; when the ON state of PL is encountered, or when the ON state of NL is encountered again, the flow back to the origin is stopped and an alarm is sounded.

AsChart 9-46 shown, See Table 8. Introduction to 26 Return to Original Mode..

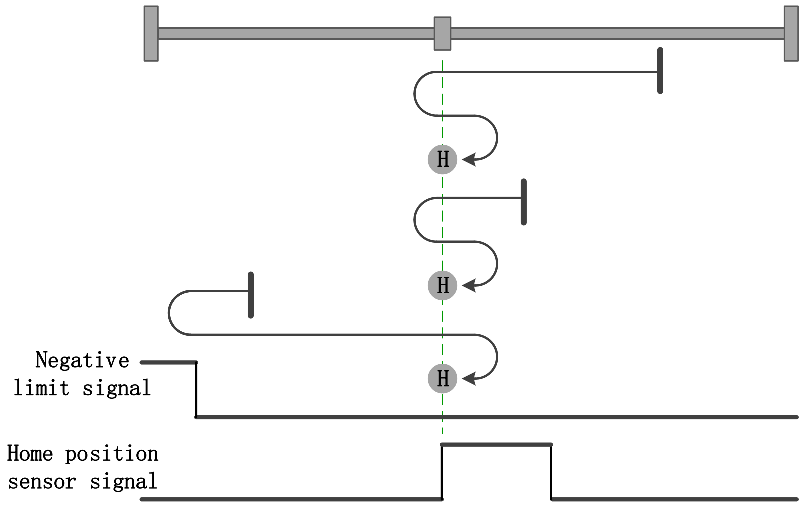


Chart 9-46 Origin mode 30 trajectory and signal state

Mode 31, Reserved, please do not set.

Mode 32, Reserved, please do not set.

Mode 33, Finding the nearest Z pulse during negative operation

Start at low speed towards negative direction to find the nearest Z pulse position as the home position. If running in the negative direction encounters the ON state of NL before finding the Z pulse, slow down and stop, then run in the positive direction to find the nearest Z pulse position as the home position.

In this mode, operation in the negative direction is automatically reversed the first time the ON state of NL is encountered; when the ON state of PL is encountered, or when the ON state of NL is encountered again, the flow back to the origin is stopped and an alarm is sounded.

AsChart 9-47 shown, See Table 8. Introduction to 26 Return to Original Mode.

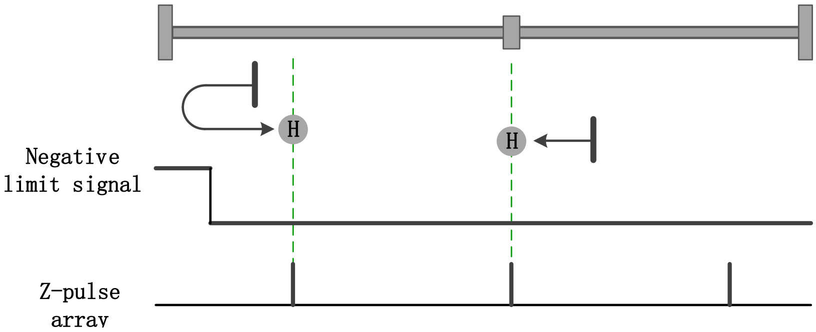


Chart 9-47 Origin mode 33 trajectory and signal state

Mode 34, Finding the nearest Z pulse during forward operation

Start with low speed towards positive direction to find the nearest Z pulse position as the home position. If running in the positive direction encounters the ON state of PL before finding the Z pulse, slow down and stop, then run in the negative direction to find the nearest Z pulse position as the home position.

In this mode, the first time the ON state of PL is encountered towards forward operation is automatically reversed; when the ON state of NL is encountered, or when the ON state of PL is encountered again, the flow back to the home position is stopped and an alarm is sounded.

AsChart9-48 shown, See Table 8. Introduction to 26 Return to Original Mode.

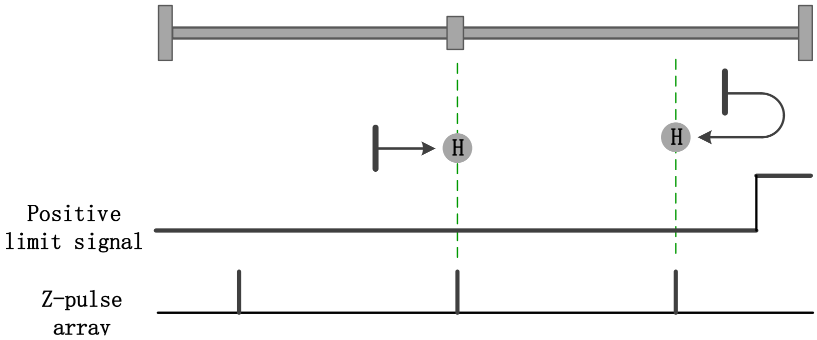
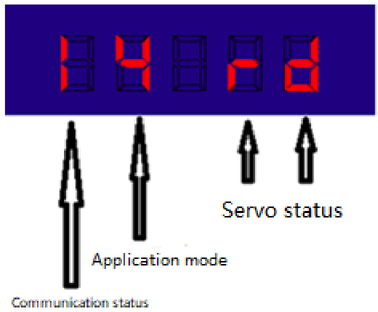


Chart9-48 Origin mode 34 trajectory and signal state

Chapter 10: PROFINET bus description

10.1 YSK2-D Servo Drive Panel Display



The panel display is divided into 3 main sections, each representing a different meaning, as detailed in the following table.

Item	Explanation
Communication Status	1- Initialization state 2- Connection status 4- Operational status
Application Mode	1- AC1 (speed control) 3- AC3 (servo internal position control) 4- AC4 (position control + servo speed control within PLC) 5- AC4+DSC (Dynamic Servo Servo Control)
Servo Status	nrd: servo ready rd: servo ready run: enable state A.XX:Warning code E.XX:Fault code

10.2 PROFINET communication

10.2.1 Support messages

YSK2-D supports AC1, AC4, AC3 and DSC applications. Standard messages and Siemens messages are supported in speed control mode and basic positioner control mode. From the driver's point of view, the process data received is the receive word and the process data to be sent is the send word. The detailed description is shown in the following table.

Message	Maximum number of PZDs (one PZD = one word)	
Standard message 1	2	2
Standard message 3	5	9
Standard message 5	9	9
Siemens Message 102	6	10

Siemens Message 105	10	10
Standard Message 7	2	2
Standard Message 9	10	5
Siemens Message 111	12	12
Additional message 750	3	1
Remaining messages to be developed		

10.2.2 All messages display

Application Level	1		4								3						Additional	
report Text	1		3		5		102		105		7		9		111		750	
PZD1	STW1	ZSW1	STW1	ZSW1	STW1	ZSW1	STW1	ZSW1	STW1	ZSW1	STW1	ZSW1	STW1	ZSW1	STW1	ZSW1	M_ADD1	M_ACT
PZD2	NSOLL_A	NIST_A	NSOLL_B	NIST_B	NSOLL_B	NIST_B	NSOLL_B	NIST_B	NSOLL_B	NIST_B	SATZANW	AKTSATZ	SATZANW	AKTSATZ	POS_STW1	POS_ZSW1	M_LIMIT_POS	
PZD3													STW2	ZSW2	POS_STW2	POS_ZSW2	M_LIMIT_NEG	
PZD4			STW2	ZSW2	STW2	ZSW2	STW2	ZSW2	STW2	ZSW2			MDI_TARPOS	XIST_A	STW2	ZSW2		
PZD5			G1_STW	G1_ZSW	G1_STW	G1_ZSW	MOMRED	MELDW	MOMRED	MELDW					OVERRIDE	MELDW		
PZD6				G1_XIST1	XERR	G1_XIST1	G1_STW	G1_ZSW	G1_STW	G1_ZSW			MDI_VELOCITY		MDI_TARPOS	XIST_A		
PZD7								G1_XIST1	XERR	G1_XIST1								
PZD8				G1_XIST2	KPC	G1_XIST2							MDI_ACC		MDI_VELOCITY	XIST_B		
PZD9								G1_XIST2	KPC	G1_XIST2			MDI_DEC					
PZD10													MDI_MOD		MDI_ACC	FAULT_CODE		
PZD11															MDI_DEC	WARN_CODE		
PZD12															USER_PZD	USER_PZD		

10.2.3 I/O data signals

Letter	Description	Receive Word/Send Word	Data Type	Calibration

STW1	Control word 1	Receiving Word	U16	
STW2	Control word	Receiving Word	U16	
ZSW1	Status word 1	Send word	U16	
ZSW2	Status word 2	Send word	U16	
NSOLL_A	Rotational speed setting value A	Receiving Word	I16	4000hex≒3000rpm
NSOLL_B	Speed setting value B	Receiving Word	I32	40000000hex≒3000rpm
NIST_A	Actual value of rotation speed A	Send word	I16	4000hex≒3000rpm
NIST_B	Actual value of rotation speed B	Send word	I32	40000000hex≒3000rpm
MOMRED	Torque reduction value	Receiving Word	U16	4000hex = maximum torque
M_ADD1	Torque added value	Send word	I16	4000hex = maximum torque C000hex = Minimum torque
M_LIMIT_POS	Forward torque limiting	Send word	I16	4000hex = maximum torque
M_LIMIT_NEG	Negative torque limiting	Send word	I16	C000hex = Minimum torque
MELDW	Message word	Send word	U16	
G1_STW	Encoder 1 control word	Receiving Word	U16	
G1_ZSW	Encoder 1 status word	Send word	U16	
G1_XIST1	Encoder 1 actual position 1	Send word	U32	
G1_XIST2	Encoder 1 actual position 2	Send word	U32	
MELDW	Message word	Send word	U16	
MDI_TARPOS	MDI Location	Receiving Word	I32	1hex≒1 LU
MDI_VELOCITY	MDI Speed	Receiving Word	I32	1hex≒1000 LU/min
MDI_ACC	MDI acceleration multiplier	Receiving Word	I16	4000hex≒100%
MDI_DEC	MDI deceleration multiplier	Receiving Word	I16	4000hex≒100%
XIST_A	Position actual value A	Send word	I32	1hex≒1 LU
OVERRIDE	Position speed multiplier	Receiving Word	I16	4000hex≒100%
FAULT_CODE	Fault Code	Send word	U16	
WARN_CODE	Warning Codes	Send word	U16	
user	User-defined reception word 0- No function 1- Additional torque	Receiving Word	I16	4000hex≒100%
user	User-defined send word 0- No function 1- Actual torque 2- Actual current	Send word	I16	4000hex≒100%

	3- DI Status			

10.3 Parameters and faults

10.3.1 Specialized parameters

The PN bus has two special groups of parameters, 14 communication parameter groups and 15-EPOS parameter groups, as detailed in the following table.

14 groups - communication parameter group

Function Code		Name	Setting range	Minimum Unit	Factory settings	Effective method	Setting method	Detailed description
F14	0	MAC1	0 ~ 65535	1	2048	Effective immediately	Shutdown settings	MAC address first 1, 2 byte
F14	1	MAC2	0 ~ 65535	1	1538	Effective immediately	Shutdown settings	MAC address first 3 or 4 byte
F14	2	MAC3	0 ~ 65535	1	272	Effective immediately	Shutdown settings	MAC address first 5 or 6 byte
F14	3	MAC4	0 ~ 65535	1	0	Effective immediately	Shutdown settings	Not used
F14	4	Equipment name1	0 ~ 65535	1	30774	Effective immediately	Shutdown settings	Currently, the device name only supports 8 characters, the servo parameter address needs to be set according to ASCII code, and only lowercase letters, numbers 0-9 and special characters are supported. 1 or 2 byte before the device name
F14	5	Device name2	0 ~ 65535	1	28782	Effective immediately	Shutdown settings	3 or 4 byte before the device name
F14	6	Device name3	0 ~ 65535	1	12336	Effective immediately	Shutdown settings	5 or 6 byte before the device name
F14	7	Device Name4	0 ~ 65535	1	12331	Effective immediately	Shutdown settings	7 or 8 byte before the device name
F14	8	Equipment IPA	0 ~ 65535	1	49320	Effective immediately	Shutdown settings	The first 8 bits of the device IP address
F14	9	Equipment IPB	0 ~ 65535	1	88	Effective immediately	Shutdown settings	The last 8 bits of the device IP address
F14	10	Equipment Network Mask A	0 ~ 65535	1	65535	Effective immediately	Shutdown settings	The first 8 bits of the device network mask
F14	11	Device Network Mask B	0 ~ 65535	1	65280	Effective immediately	Shutdown settings	The last 8 bits of the device network mask
F14	12	Network Manager A	0 ~ 65535	1	0	Effective immediately	Shutdown settings	The first 8 bits of the device network mask
F14	13	Network Manager B	0 ~ 65535	1	0	Effective immediately	Shutdown settings	The last 8 bits of the device network mask
F14	14	Data Writing Switch	0 ~ 65535	1	0	Effective immediately	Shutdown settings	Write and read switches for device MAC, IP, and name.

F14	15	922 messages Monitoring	0 ~ 65535	1	0	N/A	Display Parameters	Display the current message number
F14	16	Additional message Monitoring	0 ~ 65535	1	0	N/A	Display Parameters	Display the current additional message number
F14	17	925 Heartbeat Alarm Threshold	0 ~ 65535	1	5	Effective immediately	Operation settings	DC Sync Heartbeat Error Threshold
F14	18	944 Fault message counter	0 ~ 65535	1	0	N/A	Display Parameters	Reserved, unrealized
F14	19	947 fault number	0 ~ 65535	1	0	N/A	Display Parameters	Reserved, unrealized
F14	20	Fault serial number	0 ~ 65535	1	0	N/A	Display Parameters	Reserved, unrealized
F14	21	952 Fault status counter	0 ~ 65535	1	0	N/A	Display Parameters	Reserved, unrealized
F14	22	979_0 Sensor headers (32 bits)	0 ~ 65535	1	0	N/A	Display Parameters	The first part of the encoder [0-3] Parameter structure version low (Default value: 2) [4-7] Parameter Structure Version High (Default value: 1) [8-11] Number of sensors Default value (Default value: 1) [12-15] The length of the array corresponding to each sensor (default value: 5)
F14	24	979_1 Sensor type (32 bits)	0 ~ 65535	1	0	N/A	Display Parameters	Encoder type [0] - 0: Rotary encoder [1] 1: Linear encoder [1] - 0: G1_XIST1 relative position 1: G1_XIST1 absolute position [29]- 0:979 The parameter value Gx is static and does not change when switching from the "parking" state to the "normal" state 1:The parameter value of 979 will change when switching from the parked state to the normal state [30]- 0: If the current 979 parameter is invalid (979[1] bit31 = 0), it can take effect in the future (= 1). The change from invalid to valid is only possible. In case the measurement system is working in the "parking" state 1: 979[1] bit31 does not change [31] - 0: 979 Parameter value Gx invalid 1: 979 Parameter value Gx Valid
F14	26	979_2 Sensor resolution (32 bits)	0 ~ 65535	1	0	N/A	Display Parameters	Rotary encoder: Number of pulses per revolution
F14	28	979_3 Sensor G1_XIST1 Factor (32 bits)	0 ~ 65535	1	0	Power up again	Shutdown settings	Number of bits of quadrant information and subdivision in Gx_XIST1
F14	30		0 ~ 65535	1	0	Power up again	Shutdown settings	

		979_4 sensor G1_XIST2 factor (32 bits)						Number of bits of quadrant information and subdivision in Gx_XIST2
F14	32	979_5 sensor multi-turn lap (32 bits)	0 ~ 65535	1	0	N/A	Display Parameters	0 : Incremental encoder (absolute value readout from G2_XIST2 is not supported) 1 : Single-turn absolute value XXX: Multi-turn absolute value
F14	34	Synchronization cycle	0 ~ 65535	1	0	N/A	Display Parameters	The current DC period is displayed in us
F14	35	FPGA Synchronization Detection Threshold	0 ~ 65535	1	0	Effective immediately	Shutdown settings	Reserved, unrealized
F14	36	Speed ramp Turn on sign	0 ~ 1	1	1	Effective immediately	Shutdown settings	0 = Enable local acceleration and deceleration 1 = No local acceleration and deceleration on
F14	37	Immediately not immediately Update logo	0 ~ 1	1	0	Effective immediately	Shutdown settings	Configuration switch 1
F14	38	RFG deceleration time	0 ~ 2147483647	1	1ms	Effective immediately	Shutdown settings	Time spent in acceleration and deceleration from 0-1000RPM
F14	40	Disengage To control servo local acceleration time (32 bits)	0 ~ 2147483647	1	1ms	Effective immediately	Shutdown settings	Time spent in acceleration and deceleration from 0-1000RPM
F14	42	Disengage To control servo local deceleration Time (32 bits)	0 ~ 2147483647	1	1ms	Effective immediately	Shutdown settings	Time spent in acceleration and deceleration from 0-1000RPM
F14	44	Deceleration time in speed mode (acceleration time in units of 0-1000RPM: ms)(32 bits)	0 ~ 200000	1	0	Effective immediately	Shutdown settings	Speed mode stop deceleration time
F14	46	bit10 Hysteresis judgment value (RPM)	0 ~ 65535	1	1rpm	Effective immediately	Shutdown settings	Speed error is within the deviation range, then set ZSW1 bit8
F14	48	Speed error Testing time	0 ~ 65535	1	1ms	Effective immediately	Shutdown settings	Feedback speed and command speed over error range set ZSW1 bit8 time setting
F14	49	ARM and 200P Drop detection function Can control the switch	0 ~ 1	1	0	Effective immediately	Shutdown settings	ARM chip and 200P connection status detection switch.
F14	50	Is the synchronization period is the current loop multiplier Detection switch	0 ~ 1	1	0	Effective immediately	Shutdown settings	Whether DC cycle is current loop multiplier detection switch

15 groups-EPOS parameter group

Function Code	Name	Setting range	Minimum Unit	Factory settings	Effective Mode	Setting method	Detailed description

F15	00	EPOS maximum speed (32-bit)	1 to 80000000	1000LU/min	30,000	Immediately Effective	Shutdown settings	Maximum speed of motor speed command in Epos servo internal positioning mode.
F15	02	EPOS maximum acceleration (32 bits)	1 to 200000000	1000lu/S2	5000	Immediately Effective	Shutdown settings	Maximum motor acceleration in Epos servo internal positioning mode.
F15	04	EPOS maximum deceleration (32 bits)	1 to 200000000	1000lu/S2	5000	Immediately Effective	Shutdown settings	Maximum motor deceleration in Epos servo internal positioning mode.
F15	06	EPOS maximum ramp speed (32 bits)	1 to 200000000	1000lu/S2	5000	Immediately Effective	Shutdown settings	Epos operation mode when encountering a quick stop, deceleration stop, or paused stop ramp.
F15	08	EPOS Position Deviation Excess Threshold (32 bits)	0 ~ 2147483647	1	40000	Immediately Effective	Shutdown settings	Epos position deviation threshold
F15	10	EPOS position reaches threshold (32 bits)	0 ~ 2147483647	1 (command unit)	10	Immediately Effective	Shutdown settings	Epos position reaches threshold value
F15	12	EPOS location arrival window (32-bit)	0 ~ 100000ms	1	0	Immediately Effective	Shutdown settings	Epos position reach threshold window time
F15	14	EPOS JOG Speed 1 (32-bit)	-40000000 ~ 40000000	1000LU/MIN	-300	Immediately Effective	Operation settings	Epos speed JOG1 speed setting
F15	16	EPOS JOG Speed 2 (32-bit)	-40000000 40000000	1000LU/MIN	300	Immediately Effective	Operation settings	Epos speed JOG2 speed setting
F15	18	EPOS JOG Acceleration 1 (32-bit)	1～2000000	1000LU/S2	100	Immediately Effective	Operation settings	Acceleration of EposJOG
F15	20	EPOS JOG Deceleration 2 (32-bit)	1～2000000	1000LU/S2	100	Immediately Effective	Operation Settings	Deceleration of EposJOG
F15	22	EPOS origin regression type	0 ~ 35	1	1	Immediately Effective	Operation Settings	There are 35 ways to find the origin, and there are 35 to choose from
F15	23	EPOS origin regression high-speed speed (32-bit)	0 ~ 40000000	1000LU/MIN	5000	Immediately Effective	Operation Settings	Origin return to high-speed speed
F15	25	EPOS origin regression low speed (32-bit)	0 ~ 40000000	1000LU/MIN	300	Immediately Effective	Operation Settings	Origin return to low speed
F15	27	EPOS home recurrence acceleration/deceleration time (32 bits)	1 to 2000000	1000LU/S2	100	Immediately Effective	Operation Settings	Acceleration and deceleration of origin regression
F15	29	EPOS origin recurrence relative offset (32 bits)	0 ~ 2147483647	1	0	Immediately Effective	Operation Settings	The relative offset of the coordinates after the origin is restored.

F15	31	EPOS origin recurrence absolute offset (32 bits)	0 ~ 2147483647	1	0	Immediately Effective	Operation settings	The absolute offset of the mechanical position after the home position is restored.
F15	33	EPOS reference point coordinates (32-bit)	0 ~ 2147483647	1	0	Immediately Effective	Operation settings	Used when setting the home position directly. The set value is the current coordinate position of the servo.
F15	35	EPOS home recurrence timeout (32 bits)	0 ~ 2147483647ms	1	65535	Immediately Effective	Operation Settings	The timeout setting of return to home position.
F15	37	EPOS soft limit effective method	0 to 3	1	0	Immediately Effective	Operation Settings	Soft limit effective method 0 = No soft limit on 1 = Immediate opening of the soft limit
F15	38	EPOS soft limit positive limit value (32 bits)	-2147483648 ~ 2147483647	1	2147483647	Immediately Effective	Operation Settings	Servo forward maximum position limit
F15	40	EPOS soft limit negative limit value (32 bits)	-2147483648 ~ 2147483647	1	-2147483648	Immediately Effective	Operation Settings	Servo reverse maximum position limit
F15	42	EPOS electronic gear ratio molecule (32 bits)	1～1073741824	1	131072	Immediately Effective	Operation Settings	Epos electronic gear ratio molecule
F15	44	EPOS Electronic Gear Score (32-bit)	1～1073741824	1	10000	Immediately Effective	Operation Settings	Epos Electronic Gear Score
F15	46	111 Message 12 Send down the word	0-65535	1	0	Immediately Effective	Operation Settings	Selects the content of the last word of the 111 message 0 = no content 1=Additional torque 2=Additional speed
F15	47	111 Message 12 Upload on Go to the content	0-65535	1	0	Immediately Effective	Operation Settings	Selects the content of the last word of the 111 message 0 = no content 1 = Actual torque 2 = Actual current value 3 = DI state
F15	48	Modal axis pulse upper limit (64-bit low 32)	1 to 200000000	1000lu/S2	5000	Immediately Effective	Shutdown settings	Upper limit of pulse for modal axis mechanical load
F15	50	Modal axis pulse upper limit (64-bit high 32)	1 to 200000000	1000lu/S2	5000	Immediately Effective	Shutdown settings	Upper limit of pulse for modal axis mechanical load
F15	52	Modulo mode switch	0 ~ 1	1	0	Immediately Effective	Shutdown settings	Switch on using modal axis

10.3.2 Reading and modification of device information

10.3.2.1 Reading and writing MAC addresses

Related parameters

F14	00	MAC1	0 ~ 65535	1	2048	Effective immediately	Shutdown settings	MAC address first 1, 2 byte
F14	01	MAC2	0 ~ 65535	1	1538	Effective immediately	Shutdown settings	MAC address first 3 or 4 byte

F14	02	MAC3	0 ~ 65535	1	272	Effective immediately	Shutdown settings	MAC address first 5 or 6 byte
F14	03	MAC4	0 ~ 65535	1	0	Effective immediately	Shutdown settings	Not used
F14	14	Data Writing Switch	0 ~ 65535	1	0	Effective immediately	Shutdown settings	Write and read switches for device MAC, IP, and name.

Write 0x5000 (corresponding to decimal 20480) to F14.14, and read the device MAC address to F14.00, F14.01, F14.02 when F14.14 changes to 0.

When the network status is 1, change F14.00, F14.01, F14.02 to the desired MAC address, write 0xA55A (corresponding to decimal 42330) to F14.14, and when F14.14 changes to 0, the MAC address information is written to the device

10.3.2.2 Read and write device names

Related parameters

F14	04	Equipment name1	0 ~ 65535	1	30774	Effective immediately	Shutdown settings	Currently, the device name only supports 8 characters, the servo parameter address needs to be set according to ASCII code, and only lowercase letters, numbers 0-9 and special characters are supported. 1 or 2 byte before the device name
F14	05	Device name2	0 ~ 65535	1	28782	Effective immediately	Shutdown settings	3 or 4 byte before the device name
F14	06	Device name3	0 ~ 65535	1	12336	Effective immediately	Shutdown settings	5 or 6 byte before the device name
F14	07	Device Name4	0 ~ 65535	1	12331	Effective immediately	Shutdown settings	7 or 8 byte before the device name
F14	14	Data Writing Switch	0 ~ 65535	1	0	Effective immediately	Shutdown settings	Write and read switches for device MAC, IP, and name.

Write 0x3000 (corresponding to decimal 12288) to F14.14, and read the device name information to F14.04, F14.05, F14.06, F14.07 when F14.14 changes to 0.

When the network status is 1, change F14.04, F14.05, F14.06, F14.07 to the desired device name, write 0x4000 (corresponding to decimal 16384) to F14.14, and when F14.14 changes to 0, the device name information is written to the device

10.3.2.3 Reading and writing of device IP information

Related parameters

F14	8	Equipment IPA	0 ~ 65535	1	49320	Effective immediately	Shutdown settings	The first 8 bits of the device IP address

F14	9	Equipment IPB	0 ~ 65535	1	88	Effective immediately	Shutdown settings	The last 8 bits of the device IP address
F14	10	Equipment Network Mask A	0 ~ 65535	1	65535	Effective immediately	Shutdown settings	The first 8 bits of the device network mask
F14	11	Device Network Mask B	0 ~ 65535	1	65280	Effective immediately	Shutdown settings	The last 8 bits of the device network mask
F14	12	Network Manager A	0 ~ 65535	1	0	Effective immediately	Shutdown settings	The first 8 bits of the device network mask
F14	13	Network Manager B	0 ~ 65535	1	0	Effective immediately	Shutdown settings	The last 8 bits of the device network mask
F14	14	Data Writing Switch	0 ~ 65535	1	0	Effective immediately	Shutdown settings	Write and read switches for device MAC, IP, and name.

Write 0x1000 (corresponding to decimal 4096) to F14.14, and read the device IP information to F14.08, F14.09, F14.10, F14.11, F14.12, F14.13 when F14.14 changes to 0.

When the network status is 1, modify F14.08, F14.09, F14.10, F14.11, F14.12, F14.13 to the desired device IP information, write 0x2000 (corresponding to decimal 8192) to F14.14, and when F14.14 changes to 0, the device IP information is written to the device

10.3.3 Dedicated faults

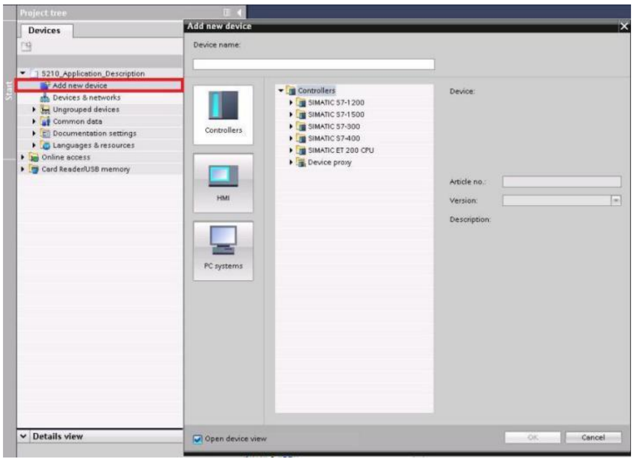
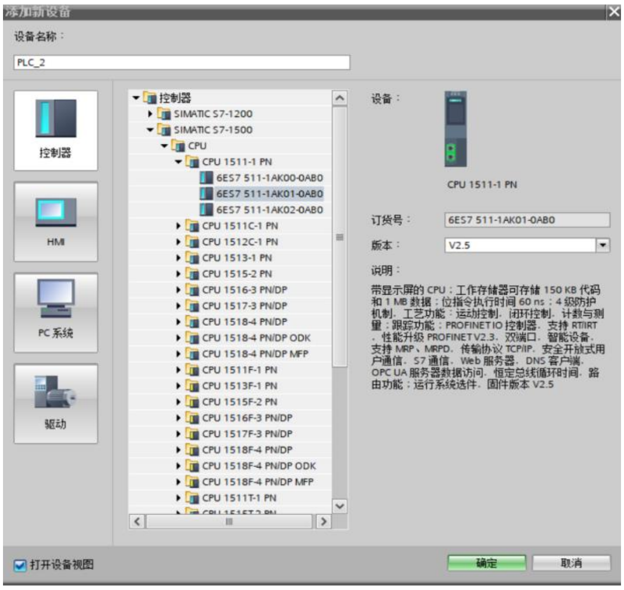
Most of the PN bus drive faults are common to the pulse type, see "Chapter 9 Faults and Warnings" for details, a few faults are PN bus specific faults, see the following table.

Fault Code	Alarm description
E.55	Offline JOG and inertia identification are not allowed when the bus is started or the PLC is not OFF, please disconnect the network cable or set the PLC to STOP before operation.
E.56	When the bus is running, it is not allowed to write the device name and IP and MAC, please unplug the network cable or set the PLC to STOP before proceeding.
E.57	arm and 200P parallel port checksum error
E.60	Profinet IRT configuration cycles and servo cycles are not divisible
E.65	DSC function is used incorrectly, DSC function is used in non-IRT mode

10.4 YSK2-D with Siemens S7-1500 for AC4/DSC synchronous cycle speed mode operation

(1) Add the S7-1500 CPU to the project.

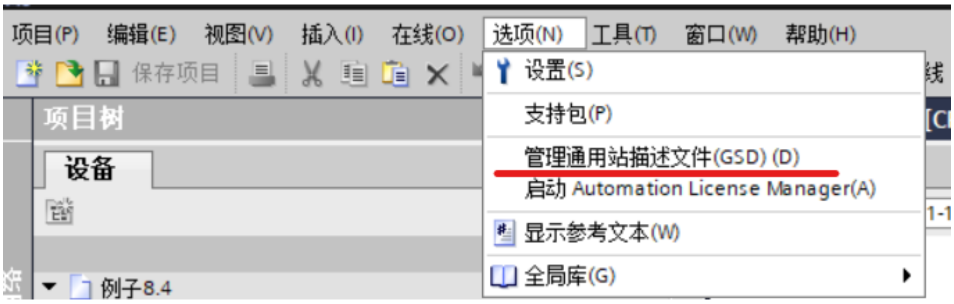
To add an S7-1500 CPU to the project, proceed as follows.

Serial number	Description
1.	Create a new project and double click on "Add new device" from the directory tree. 
2.	Here, find the PLC type used directly and add it to the project: find the corresponding PLC model on the face of the PLC. 

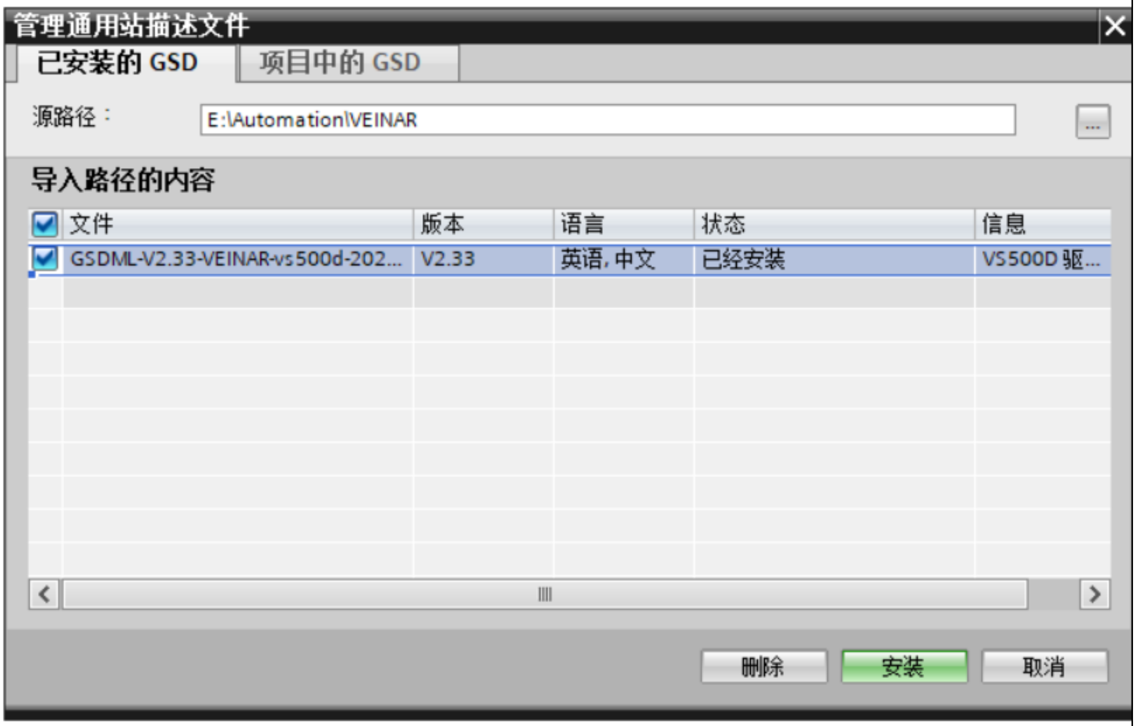
(2) Add the GSD file of YSK2-D to the project, please contact our technical staff to get the GSD file.

To add YSK2-D to the project, proceed as follows.

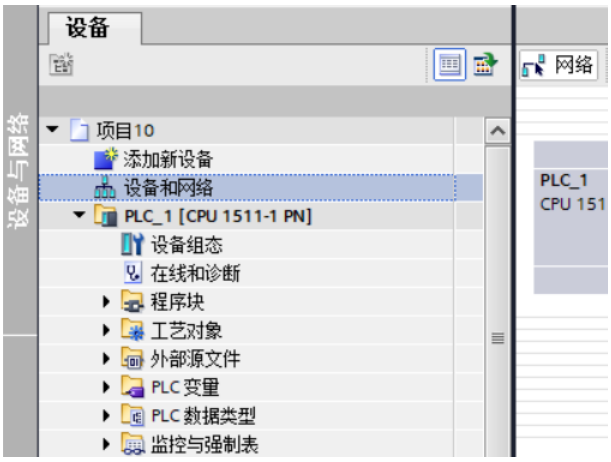
<table>
<tr><th>Serial number</th><th>Description</th></tr>
<tr><td>1.</td><td>Options->Manage General Station Description File (GSD) (D)



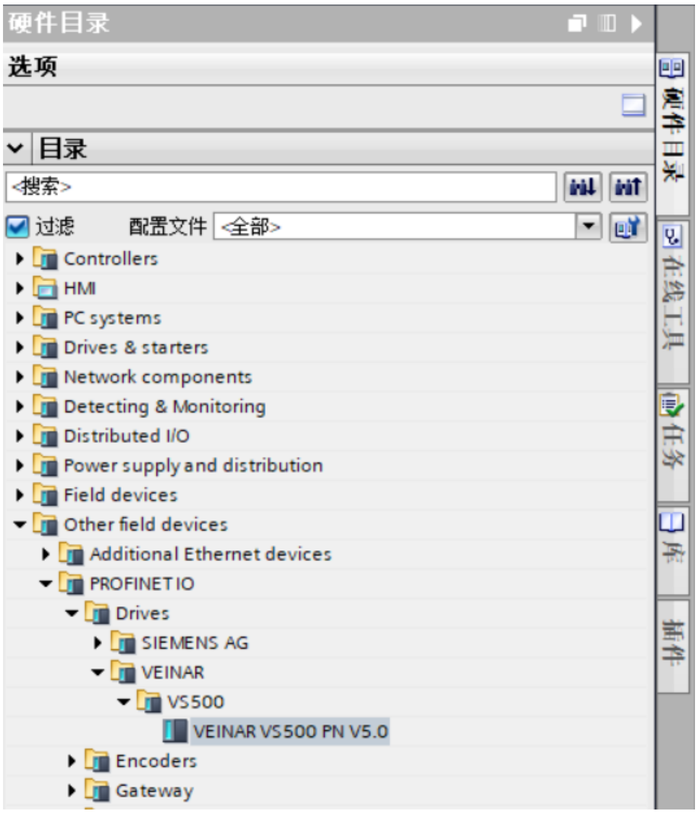
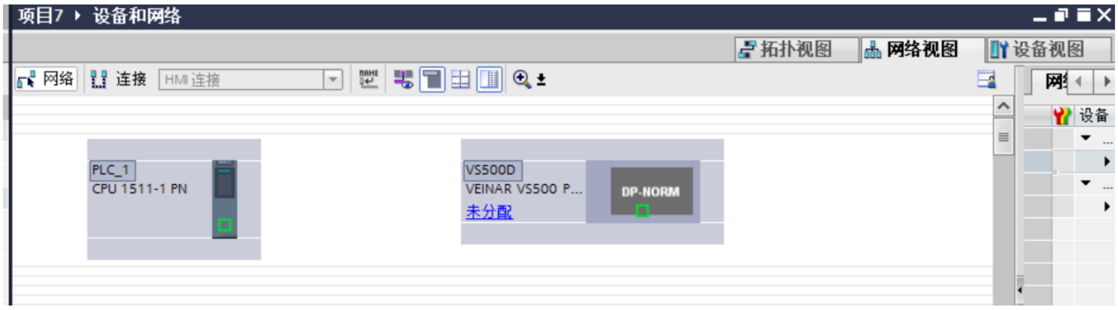
</td></tr>
<tr><td>2.</td><td>Browse the GSD file. Check the corresponding GSD file and click on the "Install" button to install it:



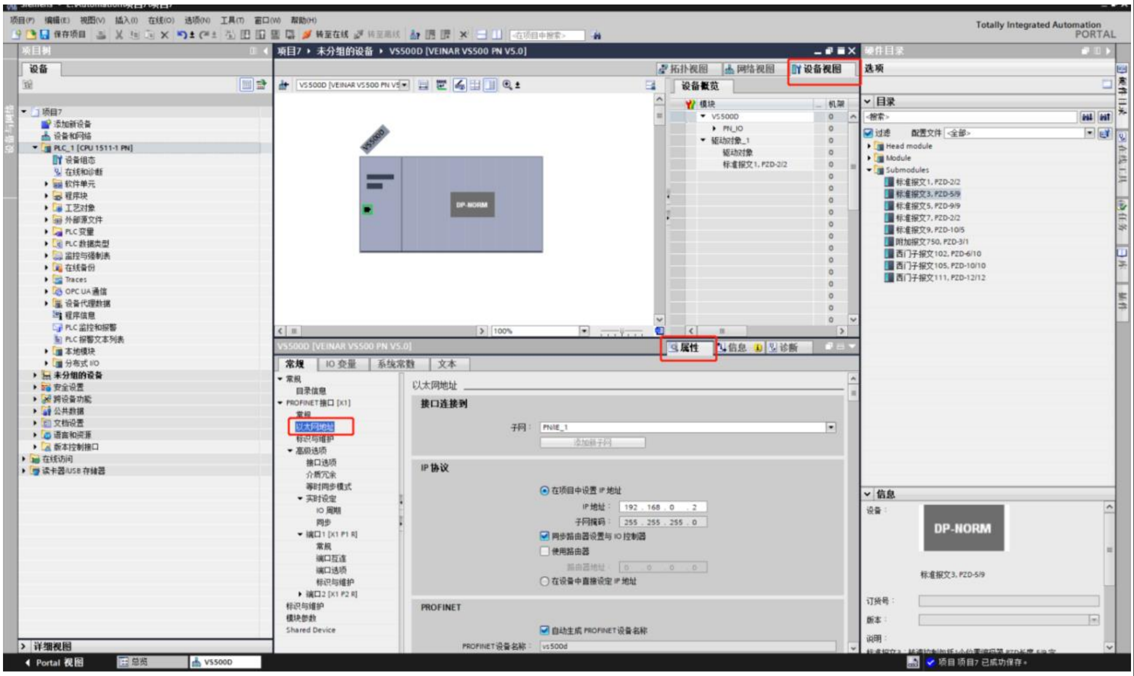
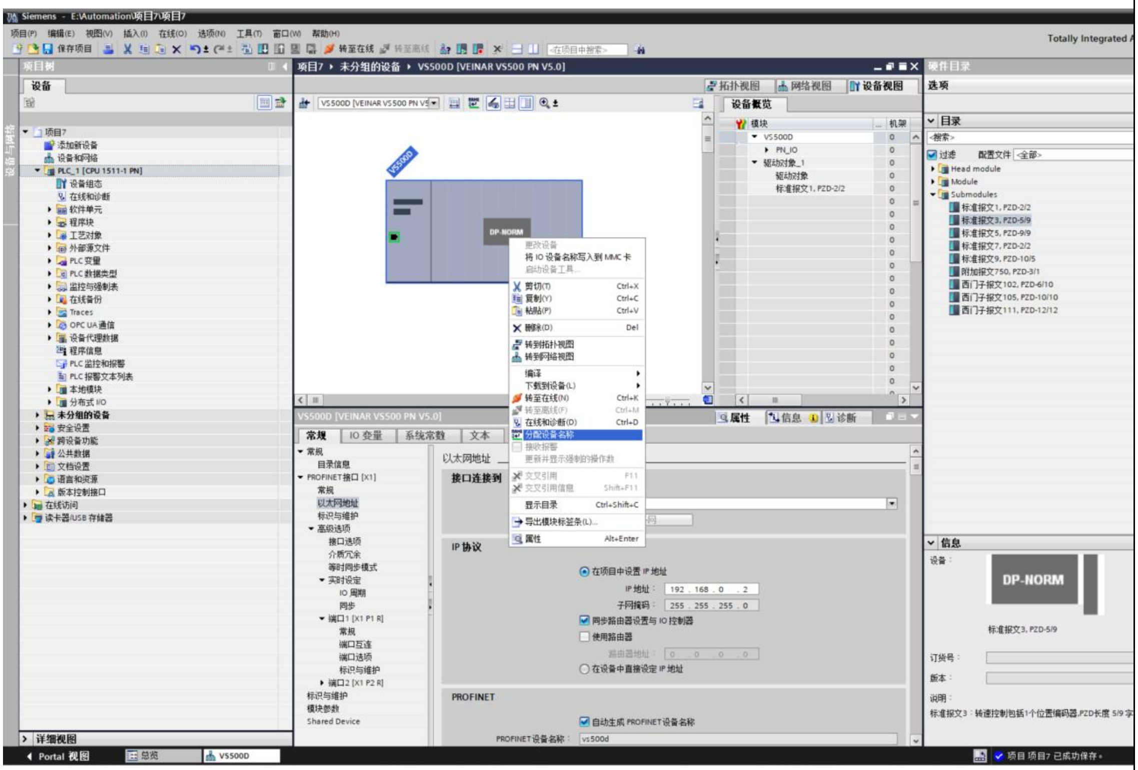
</td></tr>
</table>

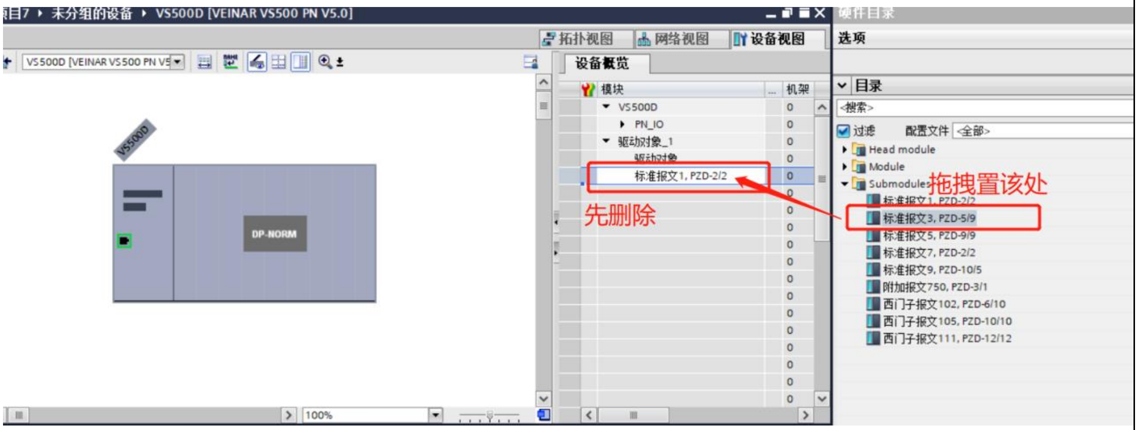
<table>
<tr><td>3.</td><td>Select the Devices and Networks view in the directory tree:

</td></tr>
<tr><td>4.</td><td>In the right-hand panel, select the Hardware Catalog option, and then click Other Field Devices.

</td></tr>
<tr><td>5.</td><td>Other Field Devices -> PROFINET IO -> Driver -> VEINAR -> YSK2-D</td></tr>
</table>

<table>
<tr><td></td><td>
</td></tr>
<tr><td>6.</td><td>Double-click on the YSK2-D or drag it to the network view:

</td></tr>
<tr><td>7</td><td>In the network view, click on "Unassigned" and select "PLC_1.PROFINET Interface_1".

</td></tr>
</table>

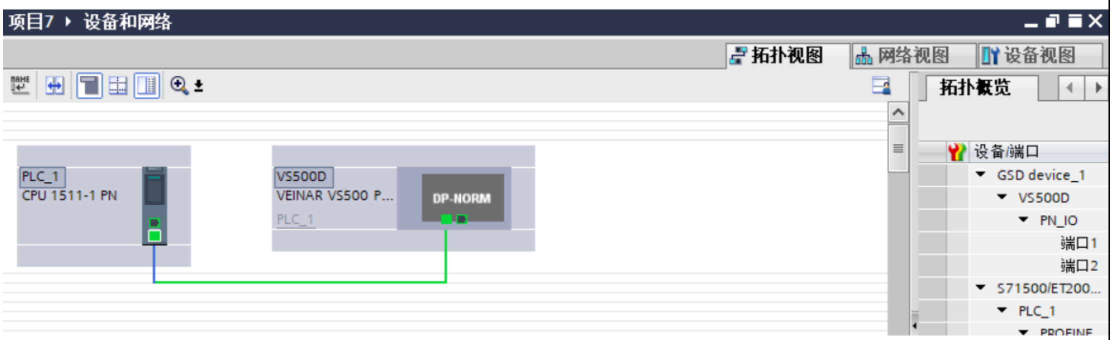
8	Configure the network and assign IP addresses and device names. 
9	To assign a device name, right-click on the device and "Assign Device Name". 

10	In the "Device View" of YSK2-D, select "Standard Message 3" from the submodule, if it is not "Standard Message 3", you need to delete the existing message and add "Standard Message 3". 

(3) Configure the topology configuration between YSK2-D and S7-1500 CPU.

Note: When using IRT isochronous mode, it is absolutely necessary and important to configure the topology of the device connections!

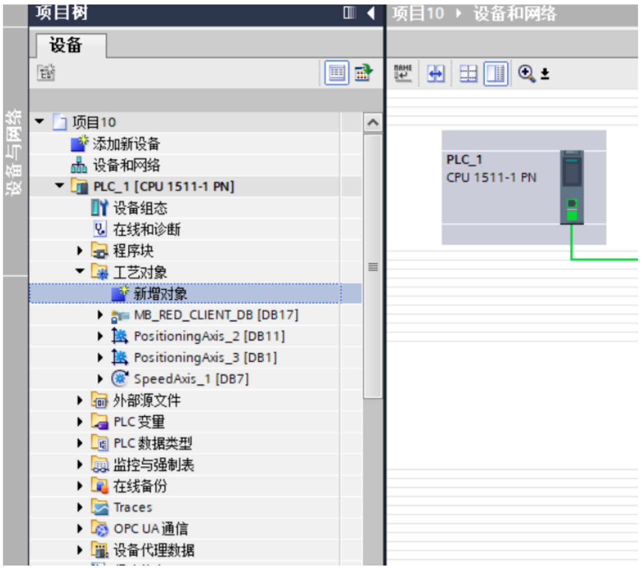
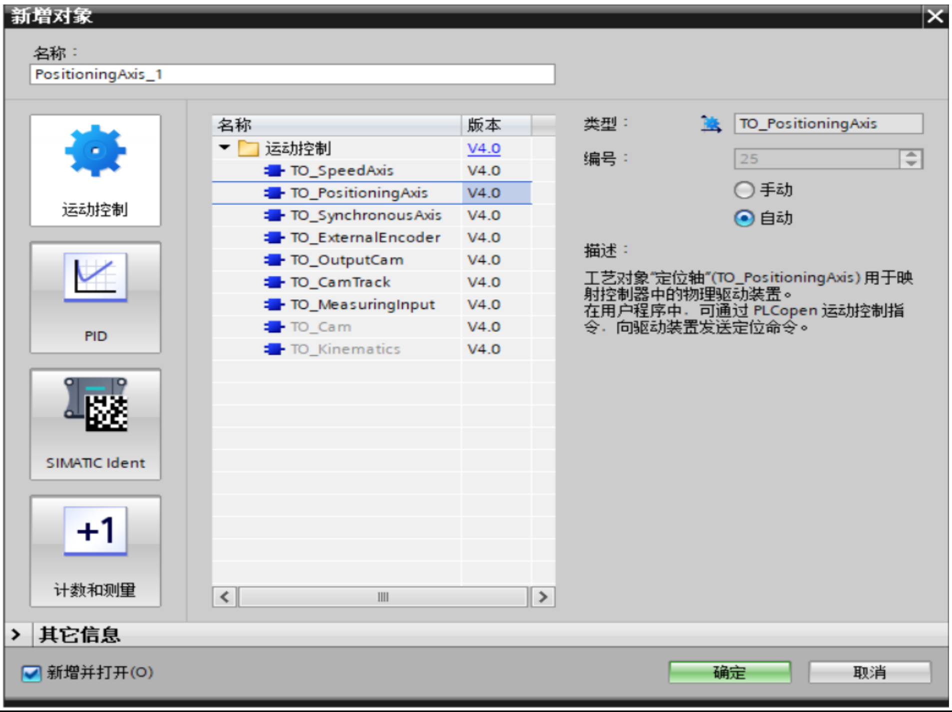
To configure the topology between the YSK2-D and the S7-1500 CPU, proceed as follows.

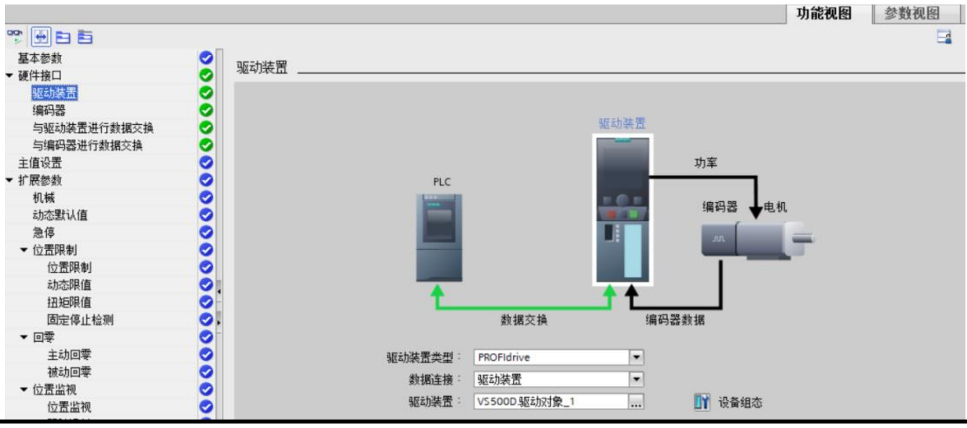
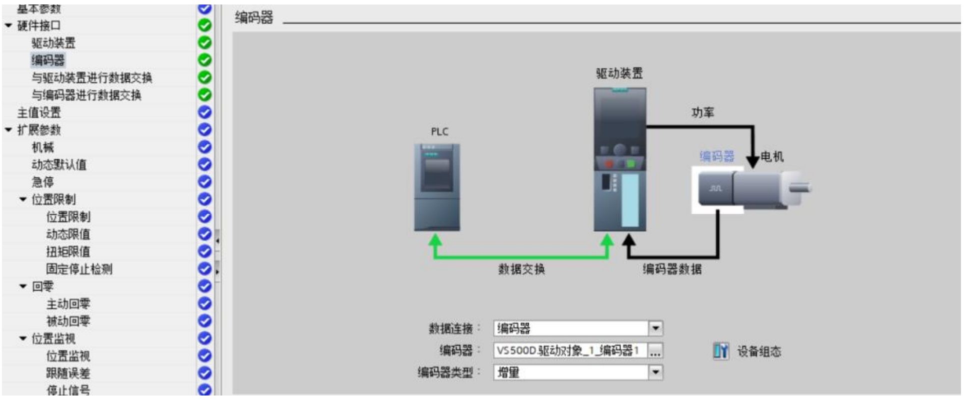
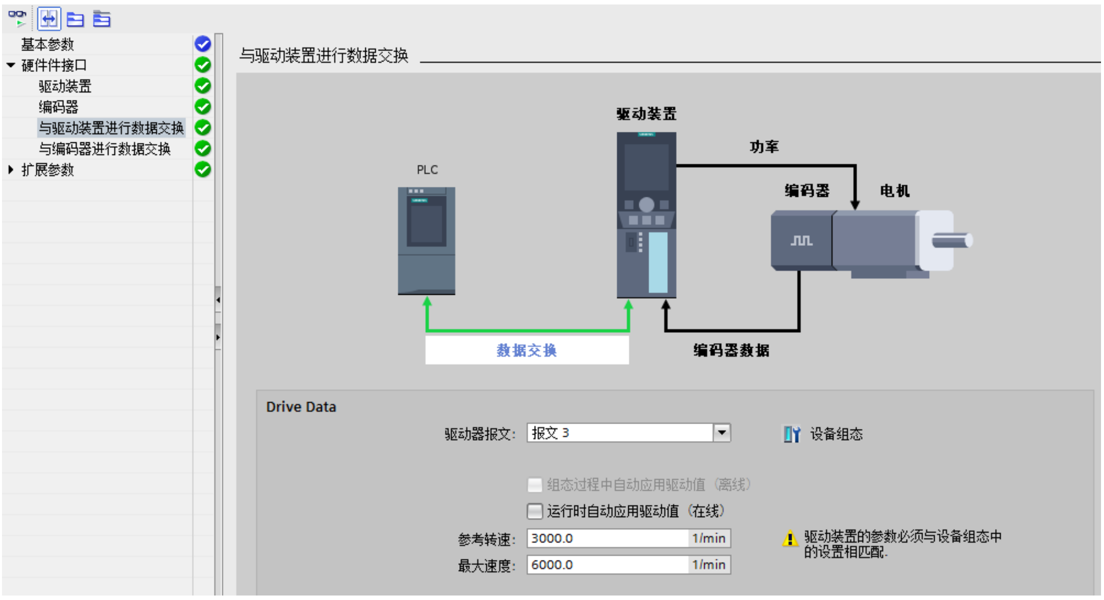
Serial number	Description
1.	Switch to the "Topology View" tab. 
2.	Configure the topology based on the actual connections via the drag-and-drop function (connection required to implement IRT).  Note: The topology configured in the project must be the same as the actual connection!

(4) Creation and programming of process objects

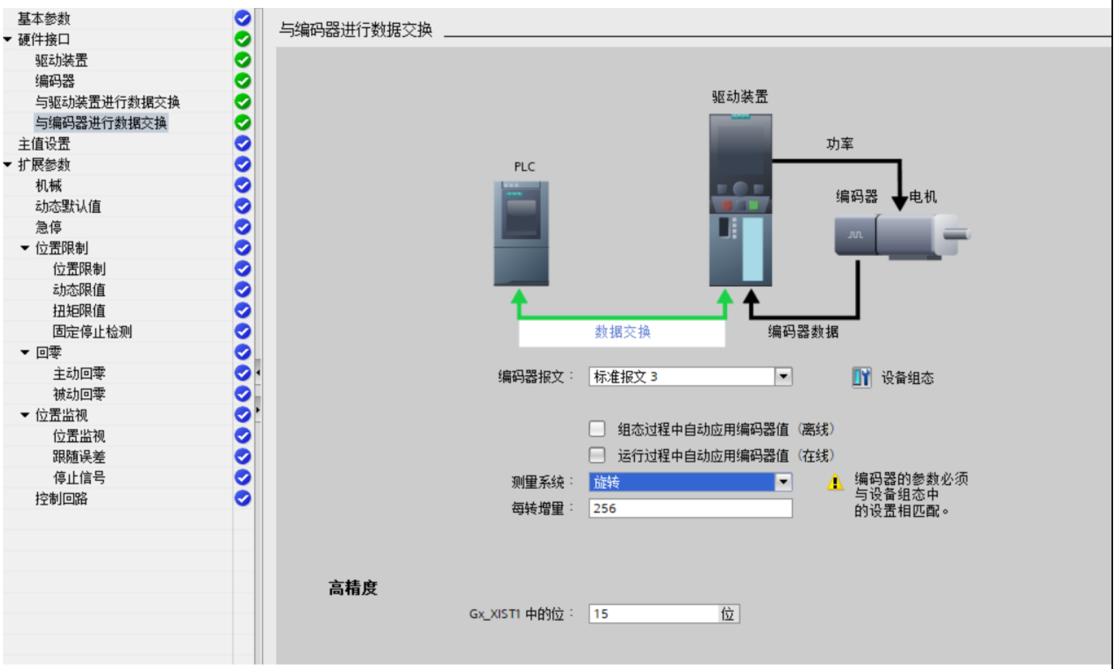
For this application example, two process objects are configured: a "positioning axis" that moves as the master axis and a "synchronization axis" that runs as the slave axis.

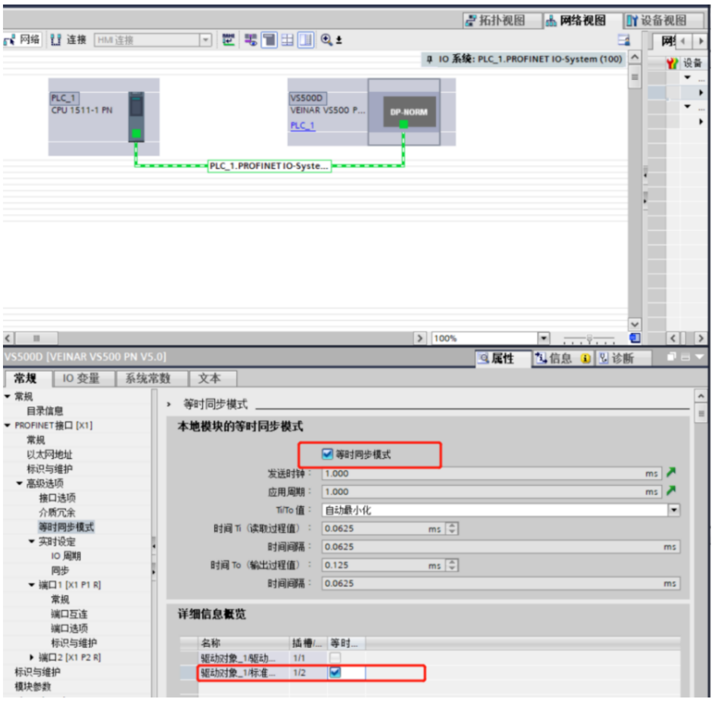
To add a configuration positioning axis, proceed as follows.

Serial number.	Description
1.	Add a new object by double-clicking on "Add New Object" in the project tree. 
2.	Select "TO_PositioningAxis" from the "Motion Control" list. 

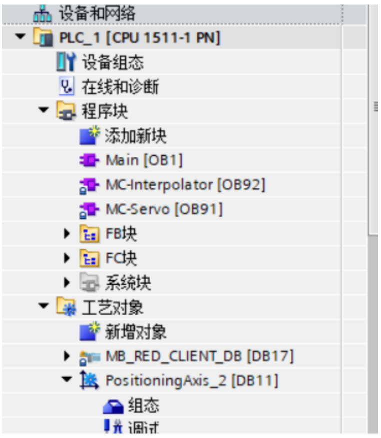
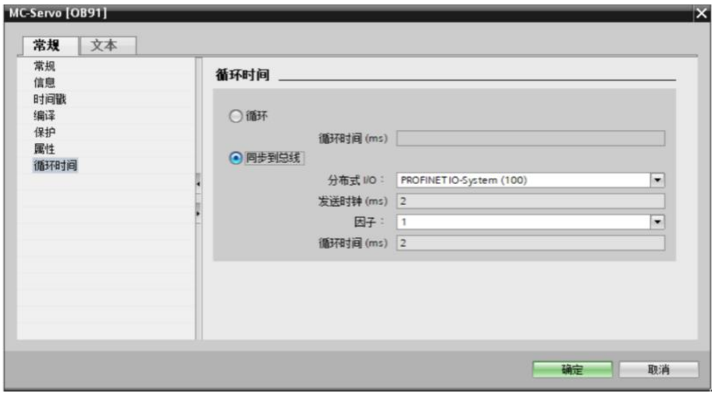
<table>
<tr><td>3.</td><td>In the "Hardware interface" of the axis, "PROFIdrive" is used as "Drive type". Select the desired YSK2-D for the drive.

</td></tr>
<tr><td>4</td><td>Configure encoder type: select incremental or absolute encoder

</td></tr>
<tr><td>5.</td><td>Check the settings in "Data exchange with drive" and "Data exchange with encoder" to ensure that the data is exchanged correctly with the drive:


If you are not sure, you can check the box to apply the driver values automatically at runtime.
Data exchange with the encoder:</td></tr>
</table>

<table>
<tr>
<td></td>
<td>


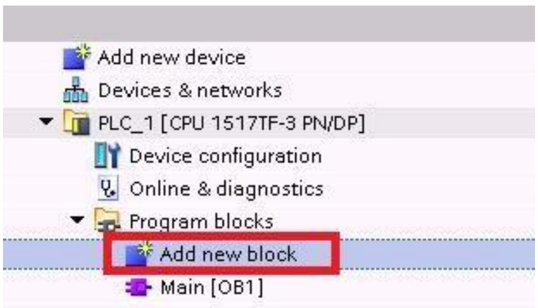
If it is not clear, you can check the box to automatically apply encoder value data exchange during the run.
</td>
</tr>
<tr>
<td>6.</td>
<td>
Open the device properties by double-clicking on the YSK2-D image.
Select the "Isochronous mode" checkbox in the "Isochronous mode" option to activate the IRT mode.


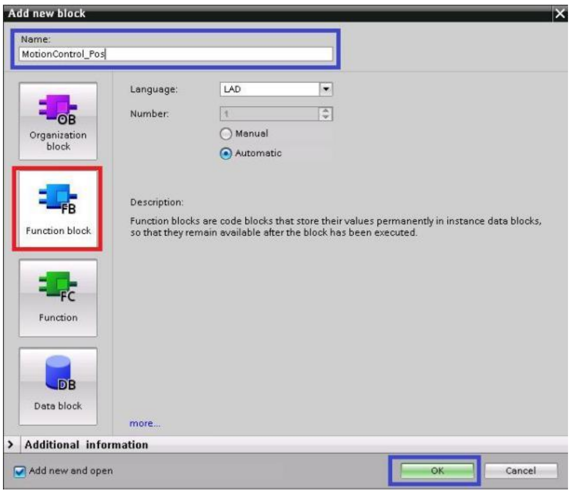
</td>
</tr>
</table>

7.	Right-click on "MC Servo [OB91]" in the block to open the OB91 block properties. 
8.	Select the "Synchronize with bus" option and select "PROFINET IO system (100)" for the distributed I/O.  Note: If the CPU performance is low, you need to consider adjusting the Factor parameter to 4 or 8 to reduce the CPU load.

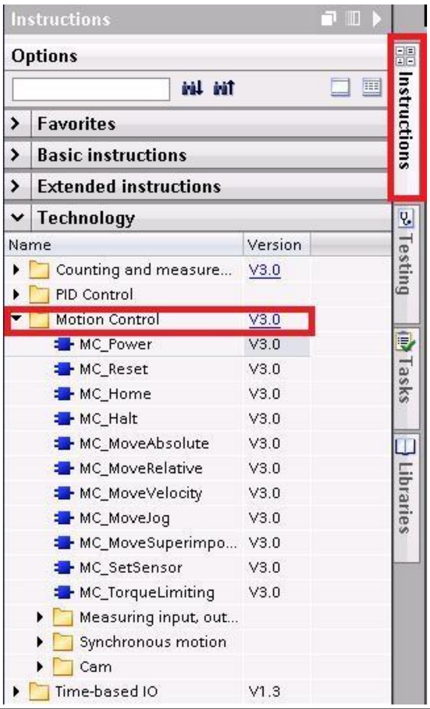
(5) Write the motion control program.

The steps for writing the motion control program are as follows.

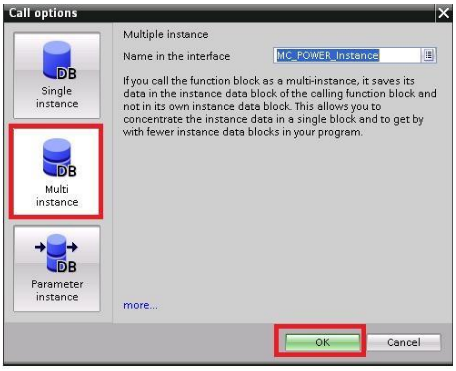
Serial number	Description
1.	Add a FB (function block) to the program and name it "MotionControl_Pos". 

<table>
<tr><td></td><td>


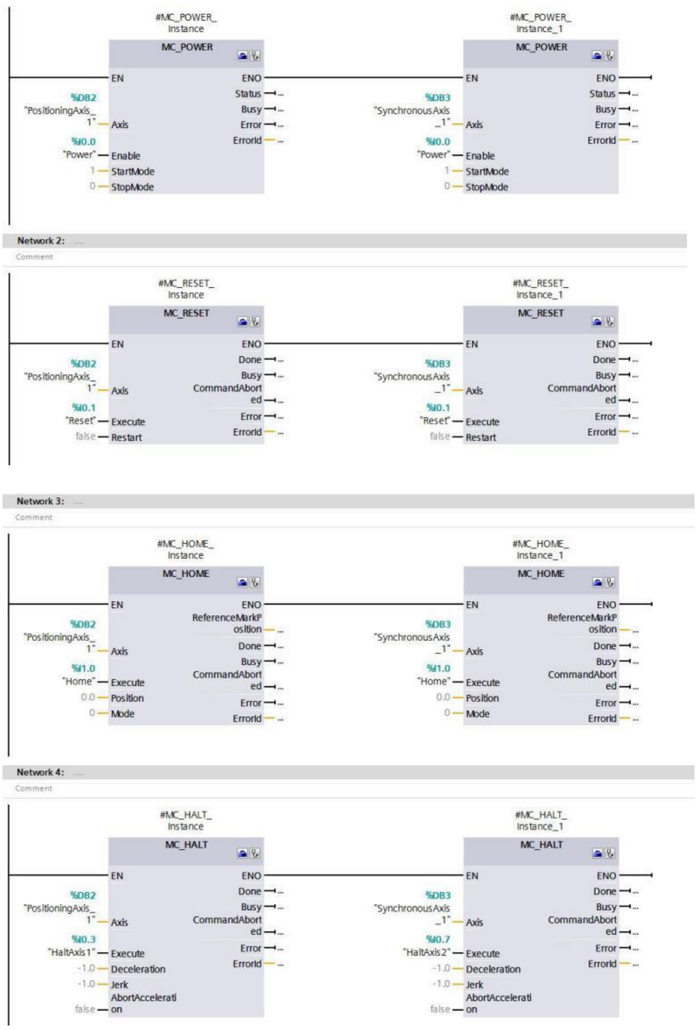
</td></tr>
<tr><td>2.</td><td>
Select the "Commands" tab and open the "Motion Control" folder.

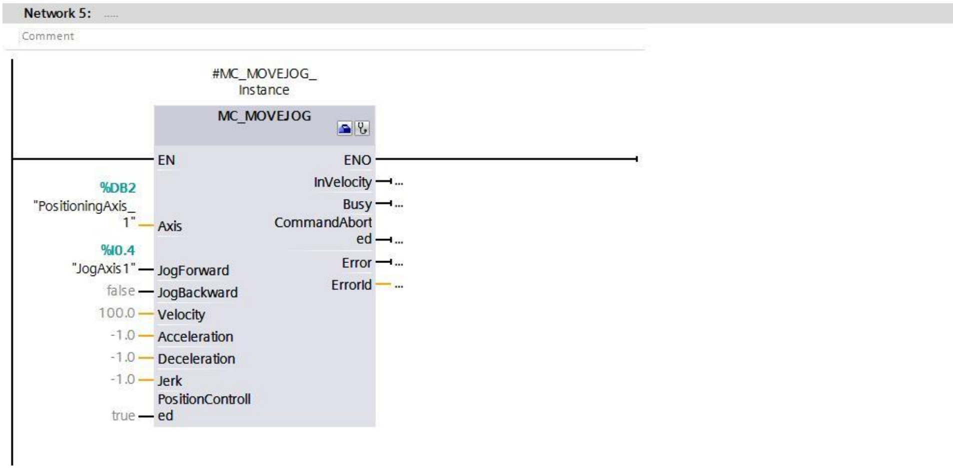


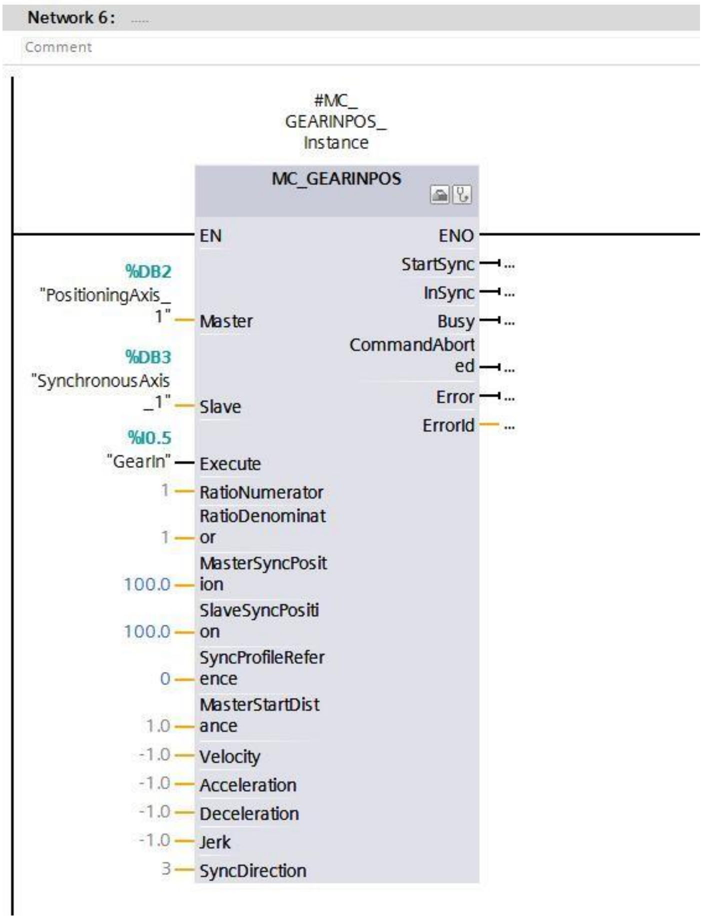
</td></tr>
<tr><td>3.</td><td>
Add the required instructions to the function blocks using the multiple background data blocks of the control instructions in FB.



The following command is used in the example.
-MC_Power
-MC_Home
</td></tr>
</table>

	-MC_MoveRelative -MC_MoveAbsolute -MC_MoveJog -MC_Halt -MC_Reset
4.	The process object is programmed for enable, fault reset, zero return, pause and point control as follows. 

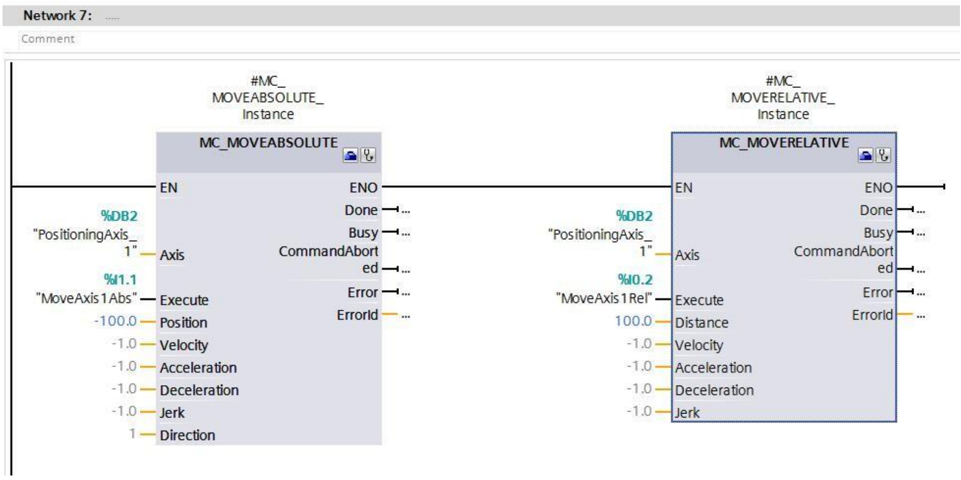
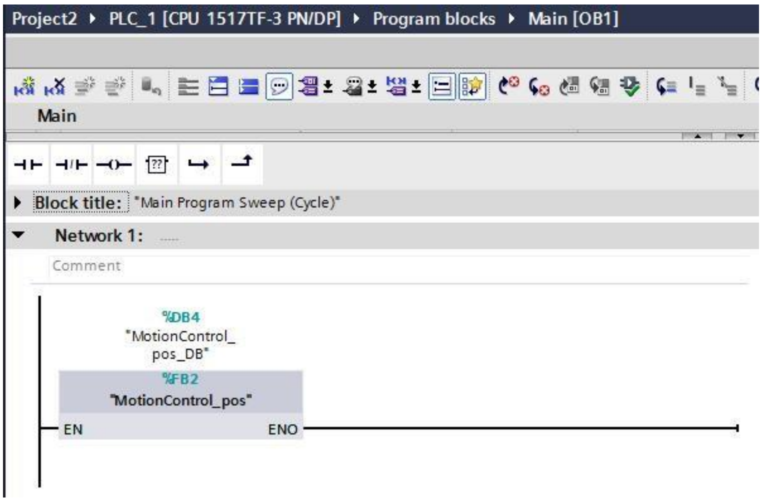
<table>
<tr><td>5.</td><td>
</td></tr>
<tr><td>6.</td><td>The electronic gear synchronization control of the process object is programmed as follows.



Note: If the SyncProfileRefernce parameter is filled with 1 (distance synchronization), then you need to fill in the

The MasterStartDistance parameter is used to establish synchronization.

This example uses time synchronization, so the SyncProfileRefernce parameter is filled with 0.</td></tr>
</table>

<table>
<tr><td>7.</td><td>Write absolute and relative positioning control programs for axes.

</td></tr>
<tr><td>8.</td><td>Calling the FB function block "MotionControl_Pos" in OB1.

</td></tr>
<tr><td>9.</td><td>Just compile and download the project to the PLC and subsequently test the program.</td></tr>
</table>

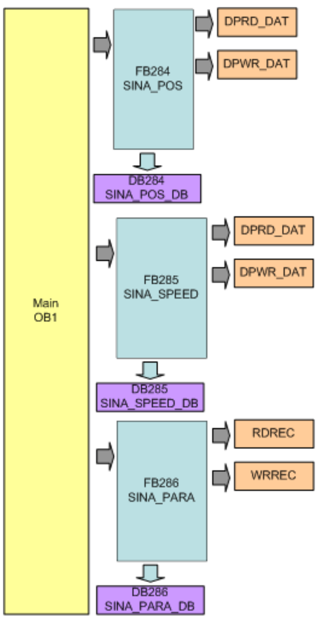
10.5 YSK2-D with Siemens S7-1500 for AC3 basic positioning mode operation

10.5.1 Overview

The S7-1500 can connect to the YSK2-D servo drive via PROFINET communication, and set the control mode of the YSK2-D drive to "Basic Position Control (EPOS)". The PLC can realize EPOS basic positioning control of YSK2-D through 111 messages and function block FB284 in the drive library provided by TIAPortal.

The control system is connected as follows.

The principle of the PLC call through the drive function block in the library is shown in the following diagram.



Programming in the SIMATIC S7-1500 consists of the following components.

（1）Cyclic data exchange – SINA_POS(FB284), SINA_SPEED(FB285)

This function block enables periodic communication between the PLC and SINAMICS drives for commands and status, such as motor operation commands, position and speed setpoints, etc., or to receive the status and actual speed values of the drives.

（2）Parameter acquisition for acyclic communication – SINA_PARA(FB286):

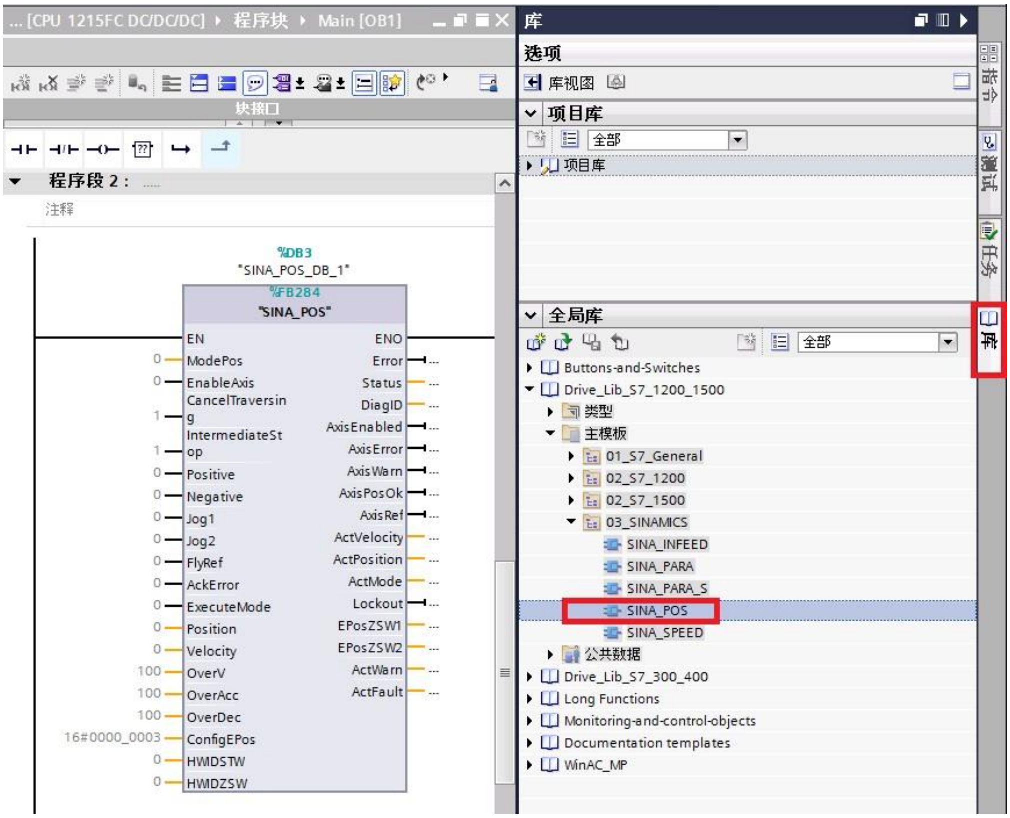
This function block implements PLC access to the parameters of SINAMICS drives, such as reading or writing data block parameters. After installing StartDrive software, the driver library file will be installed automatically in Protherm software, software download link.

https://support.industry.siemens.com/cs/us/en/view/68034568

10.5.2 SINA_POS(FB284) Function Block Pin Description

The function block FB284 for the S7-1500 and S7-1200 control YSK2-D to implement EPOS basic positioning control is located in the command library as shown in the figure below: the function block can be called in the following OBs.

（1）Recurring tasks: OB1



（2）Cyclic interrupt OB: e.g. OB32

This function block cyclically activates the basic positioning process functions in the SINAMICS drive. It should be noted that Siemens standard telegram 111 must be used on the drive side.

The FB284 function block pins are explained in the following table:

Pins	Data Type	Default Value	Description

ModePos	INT	0	Operation mode: 1 = Relative positioning 2 = Absolute positioning 3 = Continuous position operation 4 = Zero return operation 5 = Set back to zero position 6 = Run position block 0 to 16 7 = Tap jog 8 = Tap increment (not supported)
EnableAxis	BOOL	0	Servo run command. 0 = OFF1 1 = ON
CancelTransing	BOOL	1	0 = Running task rejected for activation 1 = No rejection
IntermediateStop	BOOL	1	Intermediate stops. 0 = Intermediate stopping of running tasks 1 = No stop
Positive	BOOL	0	Positive Direction
Negative	BOOL	0	Negative Direction
Jog1	BOOL	0	Forward pointing (Signal source 1)
Jog2	BOOL	0	Forward pointing (source 2)
FlyRef	BOOL	0	0 = Do not select zero return on run 1 = Select zero return on run
AckError	BOOL	0	Fault Reset
ExecuteMode	BOOL	0	Activate positioning jobs or receive setpoints
Position	DINT	0[LU]	For operation mode 1 or 2, set position value [LU] For run mode 6, set the block number for the run
Velocity	DINT	0 [1000LU/min]	Speed setting [1000LU/min] for operation modes 1, 2 and 3
OverV	INT	100[%]	Speed multiplier in all operating modes 0-199%
OverAcc	INT	100[%]	Acceleration multiplier in direct setpoint/MDI mode 0-100%
OverDec	INT	100[%]	Deceleration multiplier in direct setting value/MDI mode 0-100%
ConfigEPOS	DWORD	0	This pin can be used to transmit 111 messages in STW1, STW2, EPosSTW1, EPosSTW2 The correspondence of the transmitted bits is shown in the following table: ConfigEPos bit — 111 message bits ConfigEPos.%X0 — STW1.%X1 ConfigEPos.%X1 — STW1.%X2

				ConfigEPos.%X2 POS_STW2.%X14 ConfigEPos.%X3 POS_STW2.%X15 ConfigEPos.%X4 POS_STW2.%X11 ConfigEPos.%X5 POS_STW2.%X10 ConfigEPos.%X6 POS_STW2.%X2 ConfigEPos.%X7 STW1.%X13 ConfigEPos.%X8 POS_STW1.%X12 ConfigEPos.%X9 STW2.%X0 ConfigEPos.%X10 STW2.%X1 ConfigEPos.%X11 STW2.%X2 ConfigEPos.%X12 STW2.%X3 ConfigEPos.%X13 STW2.%X4 ConfigEPos.%X14 STW2.%X7 ConfigEPos.%X15 STW1.%X14 ConfigEPos.%X16 STW1.%X15 ConfigEPos.%X17 POS_STW1.%X6 ConfigEPos.%X18 POS_STW1.%X7 ConfigEPos.%X19 POS_STW1.%X11 ConfigEPos.%X20 POS_STW1.%X13 ConfigEPos.%X21 POS_STW2.%X3 ConfigEPos.%X22 POS_STW2.%X4 ConfigEPos.%X3 POS_STW2.%X6 ConfigEPos.%X24 POS_STW2.%X7 ConfigEPos.%X25 POS_STW2.%X12 ConfigEPos.%X26 POS_STW2.%X13 ConfigEPos.%X27 STW2.%X5 ConfigEPos.%X28 STW2.%X6 ConfigEPos.%X29 STW2.%X8 ConfigEPos.% STW2.%X9

			X30 Hardware limit enable, zero return switch signals, etc. can be transmitted to the driver in this way. Note: If a variable is assigned to this pin in the program, the driver must ensure that ConfigEPos.%X0 and ConfigEPos.%X1 are both 1 in order to Run.
HWIDSTW	HW_IO	0	Symbol name or HW ID (SetPoint) of SIMATIC S7-1200, S7-1500 setpoint slot
HWIDZSW	HW_IO	0	Symbol name or SIMATIC S7-1200, S7-1500 actual value slot of HW ID (Actual Value)
Output			
Error	BOOL	0	1 = Error appears
Status	Word	0	Display Status
DiagID	WORD	0	Extended communication failures
ErrorId	INT	0	Operational mode error/block error. 0 = No error 1 = Communication activated 2 = Incorrect operation mode selected 3 = Incorrectly set parameters 4 = Invalid run block number 5 = Drive fault activation 6 = Switch disabled activated 7 = Return to zero during run cannot start
AxisEnabled	BOOL	0	Drive is enabled
AxisError	BOOL	0	Drive failure
AxisWarn	BOOL	0	Drive Alarm
AxisPosOk	BOOL	0	The target position of the axis is reached
AxisRef	BOOL	0	Zero return position setting
ActVelocity	DINT	0	Current speed [40000000h in hexadecimal corresponds to the rated speed of the motor set by F00.15]
ActPosition	DINT	0[LU]	Current position [LU]
ActMode	INT	0	Current active operating mode
EPosZSW1	WORD	0	Status of EPOS ZSW1
EPosZSW2	WORD	0	Status of EPOS ZSW2
ActWarn	WORD	0	Current alarm code
ActFault	WORD	0	Current fault code

10.5.3 Functional implementation of the SINA_POS function block

10.5.3.1 Overview

The basic positioning (EPOS) of the YSK2-D is a very important function for the position control of the drive. It can be used for absolute and relative positioning of rotary axes.

In addition, the parameters related to the control mode need to be set in the YSK2-D's backend software to ensure smooth operation of the EPOS function. The closed-loop position controller contains the following components.

- Preparation of actual position values (including evaluation of measurement inputs and finding reference points)
- Position controller (including limits, adaptations, pre-control calculations)
- Monitoring (stationary, positioning and dynamic tracking error monitoring)

The basic position controller can also perform the following functions: mechanical systems.

- Modal axis / linear axis
- Location tracking/restrictions
- Speed Limit
- Software limit switches
- Hardware limit switches
- Position/Static Monitoring
- Dynamic tracking error monitoring

10.5.3.2 SINA_POS (FB284) operating mode

10.5.3.2.1 Operating conditions

① Axis is internally set to 1 via the input pin EnableAxis=1 for OFF2 and OFF3. If the axis is ready and driven without fault (AxisErr="0"), the axis is enabled after EnableAxis is set to 1 and the output pin AxisEnabled signal becomes 1.

② The ModePos input pin is used for operation mode selection. It can be switched in different operation modes, e.g. Continuous operation mode (ModePos=3) can be switched to absolute positioning mode (ModePos=2) during operation.

③ The input signal CancelTransing, IntermediateStop is valid for all operation modes except pointing and must be set to "1 when running EPOS with the following setting instructions.

④ If you set CancelTransing, the axis will stop at the maximum deceleration and discard the work data, and you can switch the operation mode after the axis stops. If you set IntermediateStop=0, the ramp stop will be performed with the current applied deceleration value and no work data will be discarded. The operation mode can be switched after the axis has come to a standstill. The function to return to zero during operation can be selected by FlyRef input in any operation mode.

⑤ To activate the hardware limit switch, if a hardware limit switch is used, you need to set the input pin ConfigEPos.%X3 (POS_STW2.15) of the FB284 function block to 1 to activate the hardware limit function of the YSK2-D. Positive and negative hardware limit switches can be connected to DI1 to DI9 of the YSK2-D driver (default DI6 and DI7)

⑥ To activate the software limit switch, if the software limit switch is used, you need to set the input pin ConfigEPos.%X2 (POS_STW2.14) of the FB284 function block to 1 to activate the software limit function of the YSK2-D (F15.37). Set F15.37 (soft limit effective mode), F15.38 (negative soft limit position) and F15.40 (positive soft limit position) in the YSK2-D.

10.5.3.2.2 Absolute positioning operation mode

The "absolute positioning" mode of operation can be realized by the drive function "MDI absolute positioning", which uses the drive's internal position controller to achieve absolute position control.

Request:

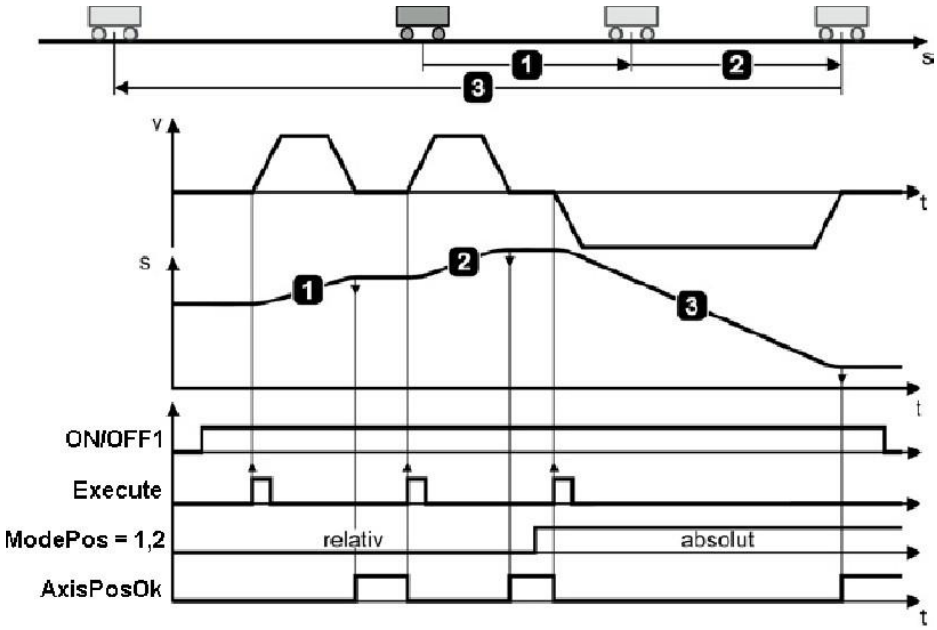
- Operation mode selection ModePos=2
- Axis enableEnableAxis=1
- Axis must be zeroed or encoder calibrated
- If the switching mode is greater than 3, the axis must be stationary and can be switched within the MDI operating mode at any moment (ModePos=1,2,3)

Steps.

- Specify the target position and dynamic response parameters by entering the parameters Position,Velocity
- Specify the speed, plus or minus speed multiplier by entering parameters OverV, OverAcc, OverDec
- The run conditions "CancelTransing" and "IntermediateStop" must be set to "1", and Jog1 and Jog2 must be set to "0". and Negative must be "0".
- The positioning motion is triggered by the rising edge of ExecuteMode, which activates the current state of the command or is monitored by EPosZSW1 and EPosZSW2, and is set to 1 by AxisPosOk when the target position is reached, and the output parameter Error is set to 1 when an error occurs during positioning.

Note: The currently running command can be replaced by a new command via ExecuteMode rising edge, but only for running modes ModePos1,2,3.

The absolute positioning mode control timing is shown in the following diagram.



Servo-side parameter setting

F15.00	Maximum speed
F15.02	Maximum acceleration
F15.04	Maximum deceleration
F15.08	Excessive deviation threshold
F14.10	Position reaches threshold

Open modal axis F15.50 = 1 Set F15.48, according to the upper limit of the mechanical load single turn

There are 3 combinations of modulus in absolute position mode.

[0] Only if ModePos=2 will operate between 0 and the mechanical maximum.
[1] When ModePos=2 + Positive=1, Negative =0 will run to absolute positive according to the given position value.
[2] When ModePos=2 + Negative =1, Positive=0 will run in the absolute positive direction according to the given position value.

10.5.3.2.3 Relative positioning operation mode

The "Relative Positioning" mode of operation can be achieved by the drive function "MDI Relative Positioning", which uses the drive's internal position controller to achieve relative position control.

Request:

- Operation mode selection ModePos=1

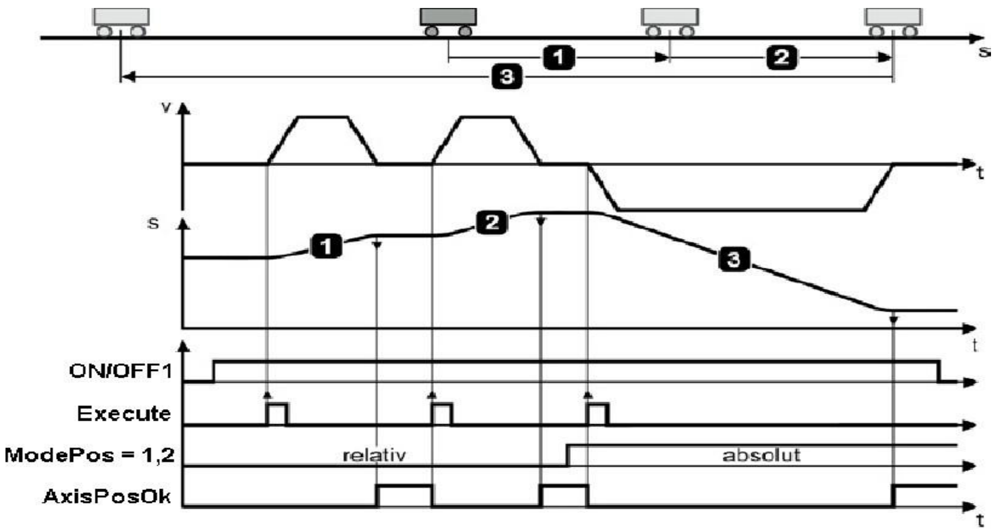
- The driver's run command EnableAxis=1
- Axis must not be zeroed or encoder not calibrated
- If the switching mode is greater than 3, the axis must be stationary and can be switched at any time within the MDI operating mode (ModePos=1,2,3)

Steps.

- Specify the target position and dynamic response parameters by inputting the parameters Position,Velocity
- The parameters OverV, OverAcc, OverDec are used to specify the speed, the multiplier of acceleration and deceleration, and the running conditions "CancelTransing" and "IntermediateStop" must be set to "1". The running conditions "CancelTransing" and "IntermediateStop" must be set to "1", Jog1 and Jog2 must be set to "0", and the parameters Positive and Negative must be "0".
- The positioning motion is triggered by the rising edge of ExecuteMode, which activates the current state of the command or is monitored by EPosZSW1 and EPosZSW2, and is set to 1 by AxisPosOk when the target position is reached, and the output parameter Error is set to 1 when an error occurs during positioning.

Note: The currently running command can be replaced by a new command via ExecuteMode rising edge, but only for running modes ModePos 1,2,3.

The relative positioning mode control timings are shown below.



Servo-side parameter setting:

F15.00	Maximum speed
F15.02	Maximum acceleration
F15.04	Maximum deceleration
F15.08	Excessive deviation threshold
F14.10	Position reaches

	threshold

Turn on modal axis F15.50 = 1 Set F15.48, according to the upper limit of the mechanical load single turn, there is 1 combination of modal number in relative position mode only when ModePos = 1 axis will run according to the given position.

10.5.3.2.4 Continuous operation mode (Setupmode)

The "continuous run" mode allows the axis position controller to run at a constant speed in either the forward or reverse direction, which is the drive's "MDI setup" mode of operation. (Modulo axes are not supported)

Request:

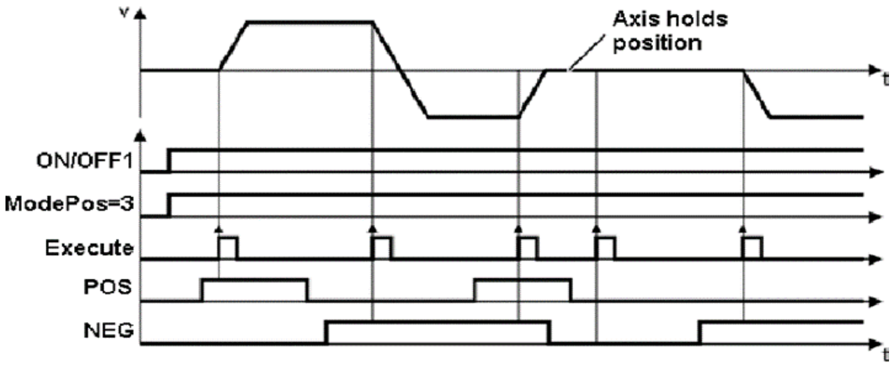
- Operation mode selection ModePos=3
- The driver's run command AxisEnable=1
- Axes do not have to be zeroed or encoders are not calibrated
- If the switching mode is greater than 3, the axis must be stationary and can be switched at any time within the MDI operating mode (ModePos=1,2,3)

Steps.

- Specify the speed of operation by entering the parameter Velocity
- Specify the speed, plus or minus speed multiplier by entering parameters OverV, OverAcc, OverDec
- The run conditions "CancelTransing" and "IntermediateStop" must be set to "1", Jog1 and Jog2 must be set to "0"
- The direction of operation is determined by Positive and Negative (one of the directions must be 1)
- The positioning motion is triggered by the rising edge of ExecuteMode, the current state of the activation command or monitored by EPosZSW1 and EPosZSW2, and the output parameter Error is set to 1 when the target position is reached by AxisPosOk and when an error occurs during positioning.

Note: The currently running command can be replaced by a new command via ExecuteMode rising edge, but only for running modes ModePos 1,2,3.

The continuous operation mode control timing is shown below.



10.5.3.2.5 Back to zero

This function allows the axis to be zeroed along the forward or reverse direction according to the preset zeroing speed and mode, activating the active zeroing of the drive.

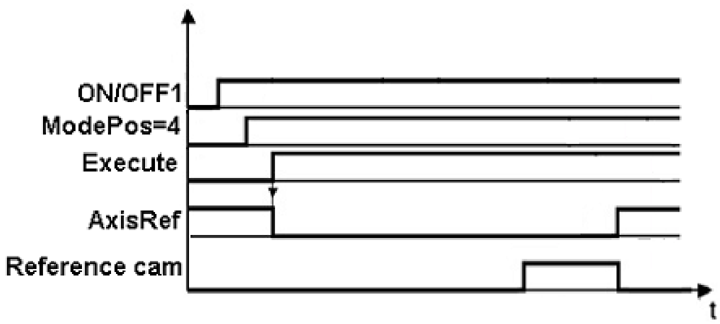
Request:

- Operation mode selection ModePos=4
- The driver's run command EnableAxis=1
- It is necessary to open the servo hard limit and connect the upper limit signal and home signal.
- Axis stationary

Steps.

- Specify the speed, plus or minus speed multiplier by entering parameters OverV, OverAcc, OverDec
- The run conditions "CancelTransing" and "IntermediateStop" must be set to "1", Jog1 and Jog2 must be set to "0"
- The direction of operation is determined by Positive and Negative
- The rising edge of ExecuteMode triggers the return to zero movement, activates the current state of the command or monitors it via EPosZSW1 and EPosZSW2, and terminates the movement via the CancelTransing signal, and sets AxisRef to 1 when the return to zero is completed.

Example control timing diagram



Servo-side parameter setting:

F15	22	Origin regression type	0 to 34
F15	23	Origin return high-speed speed (32-bit)	0 ~ 40000000
F15	25	Home return low speed (32 bit)	0 ~ 40000000
F15	27	Home return acceleration and deceleration time (32 bits)	1 to 200000000
F15	29	Home Return Relative Offset (32 bits)	-1073741824～1073741824
F15	31	Absolute offset of origin regression (32 bits)	-1073741824～1073741824

Note: Choose one of relative offset and absolute offset to use, relative offset has value, relative offset is executed. Absolute offset has a value, the absolute offset is executed.

10.5.3.2.6 Setting the zero position

This mode of operation allows the zero position setting of the axis when the axis is in any position.

Request:

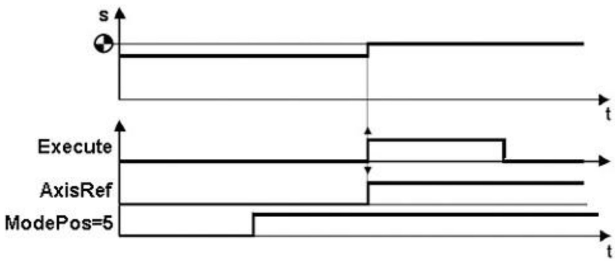
- Operation mode selection ModePos=5
- Axis is in closed loop control and is stationary

Steps.

- Set the zero position of the axis by the rising edge of Execute when the axis is stationary

Note: The zero position can be set using parameter F15.33.

Set the zero return control timing as shown below.



10.5.3.2.7 Run the program block

This block mode of operation is implemented through the driver function "Traversing blocks", which allows the automatic creation of blocks.

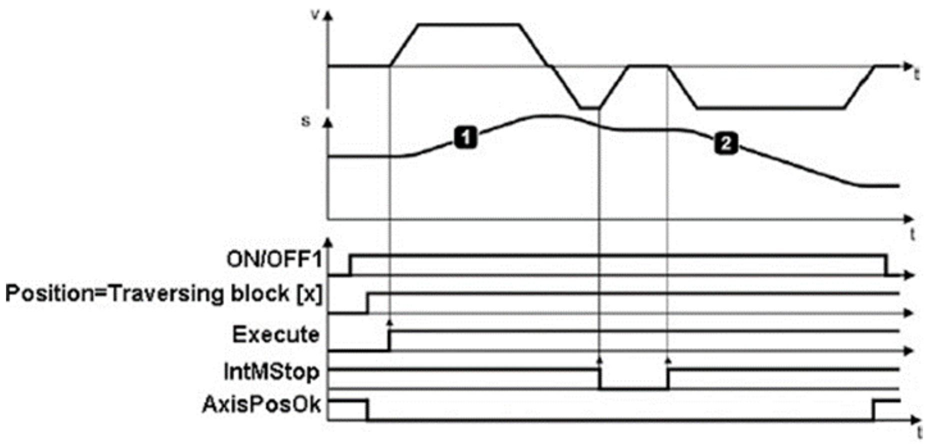
Request:

- Operation mode selection ModePos=6
- The driver's run command AxisEnable=1
- Axis stationary
- Axis must be zeroed or absolute encoder calibrated

Steps.

- The operating mode, target position and dynamic response are set in the run block parameters of the YSK2-D driver, and the OverV parameter for speed is scaled in multiples for the speed settings in the program block.
- The run conditions "CancelTransing" and "IntermediateStop" must be set to "1", Jog1 and Jog2 must be set to "0"
- The block number is set in the input parameter "Position" and the value should be 0~16
- The direction of the motion is determined by the working mode and the settings in the block, independent of the Positive and Negative parameters, which must be set to "0".
- After selecting the block number, the operation is triggered by the rising edge of Execute Mode, which activates the current status of the command or is monitored by EPosZSW1 and EPosZSW2. Busy is set to 1 during the processing of the command by the function block, and Done is set to 1 when the target position is reached, and the output parameter Error is set to 1 when an error occurs during the operation.

An example of running block control timing is shown below.



Note: During runtime, the current run command can be replaced by a new command via "ExecuteMode", but only in the same runtime mode. Modulo axis is not supported

Servo parameter setting, refer to servo 10 groups of parameters

10.5.3.2.8 Jog

The jog mode is implemented by the "Jog" function of the driver.

Request:

- Operation mode selection ModePos=7
- The driver's run command AxisEnable=1
- Axis stationary
- No zero return or absolute encoder calibration required for axes

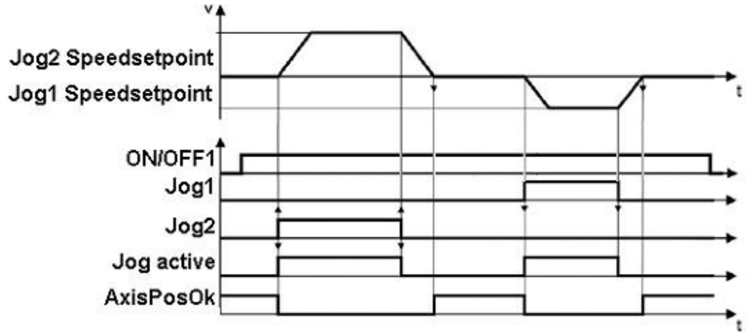
Steps.

- The speed is set in the YSK2-D, and the OverV parameter for speed is scaled by a factor of one for the speed setting.
- Run conditions "CancelTransing" and "IntermediateStop" are set to "1" by default, independent of the point operation mode.

Note: Jog1 and Jog2 are used to control the pointing operation of EPOS, the direction of motion is determined by the pointing speed set in YSK2-D driver, the default setting is Jog1 = negative pointing speed, Jog2 = positive pointing speed independent of Positive and Negative parameters, the default setting is "0 ".

- The current status of the activation command or monitored by EPosZSW1 or EPosZSW2, Busy is 1 during the processing of the command, "AxisPosOK" is set to 1 at the end of the point movement (Jog1orJog2 = 0) when the axis is stationary, and the output parameter "Error" is set to 1 when an error occurs during operation. Error is set to 1.

The point control timing is shown below.



Servo-side parameter setting

F14.14	JOG1 Speed

F14.16	JOG2 speed
F14.18	JOG maximum acceleration
F15.20	JOG maximum deceleration

10.5.3.2.9 Jog increment (not supported at this time)

The point-action incremental operation mode is implemented by the "Jog" function of the driver.

Request:

- Operation mode selection ModePos=8.
- The run command of the driver AxisEnable=1.
- Axis at rest.
- Axes do not need to be zeroed or absolute encoder calibrated.

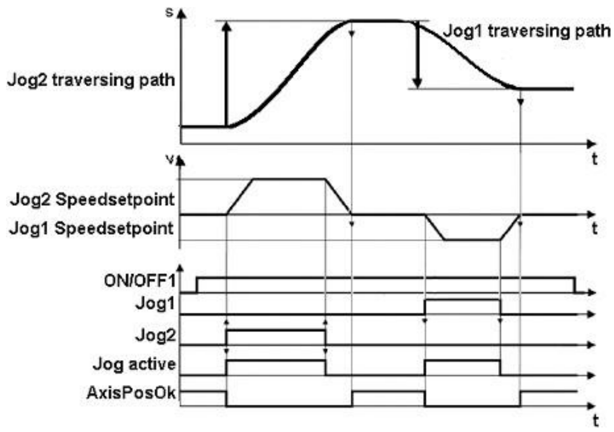
Steps.

- The point speed is set in the YSK2-D and the OverV parameter of the speed is scaled in multiples for the point speed setting.
- The run conditions "CancelTransing" and "IntermediateStop" are set to "1" by default in relation to the point-action run mode.

Note: Jog1 and Jog2 are used to control the pointing operation of EPOS, the direction of movement is determined by the pointing speed set in YSK2-D driver, the default setting is Jog1 traversingdistance,Jog2 traversingdistance=1000LU, and the Positive and Negative parameters It has nothing to do with Positive and Negative parameters, the default setting is "0".

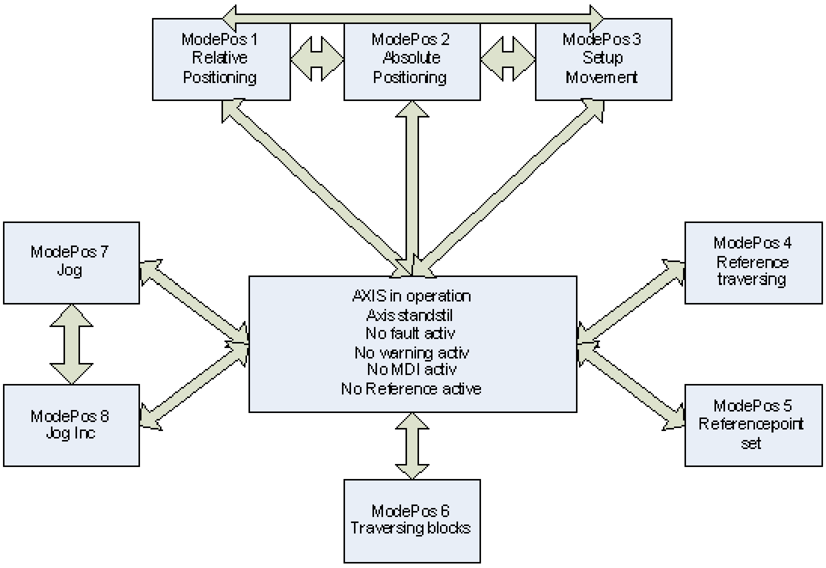
- The current status of the activation command is monitored by EPosZSW1 and EPosZSW2. Busy is set to 1 during the command processing of the function block, and "AxisPosOK" is set to 1 at the end of the jogging (Jog1or Jog2 = 0) and when the axis is stationary.

The incremental point control timing is as follows.



10.5.3.2.10 ModePos value-based operation mode switching instructions

Possible operating mode transitions based on ModePos values, as follows.



10.5.3.3 Introduction of origin return mode

Thirty-one types of return methods are defined internally (for EPOS mode), as table0-26 described. In the following description, HSW indicates the home position sensor signal, NL indicates the negative limit signal, and PL indicates the positive limit signal; ON indicates the valid state of the signal, and OFF indicates the invalid state of the signal; OFF→ON indicates the jumping edge of the signal from the invalid state to the valid state, and ON→OFF indicates the jumping edge of the signal from the valid state to the invalid state. The following describes the trajectory and signal state change of various home modes respectively, and the meaning of icons in various back home mode diagrams are as followsChart 9-18 The meaning of the icons in the diagrams of various return home modes is shown.

Table 0-1 Back to the original model introduction

return to original form	instructions
0	not
1	Start in the negative direction and switch to low speed when the OFF→ON state of NL is encountered in the negative direction, then backtrack to find the nearest Z pulse position as the home position
2	Start in the forward direction, switch to low speed when the PL's OFF→ON state is encountered during forward operation, and then back off to find the nearest Z pulse position as the home position.
3	If the HSW is invalid at start, run in the positive direction, otherwise run in the negative direction. When running in negative direction, switch to low speed when HSW When the HSW is ON→OFF, switch to low speed, and then continue to run in the negative direction to find the nearest Z pulse position as the home position.
4	If the HSW is invalid at start, run in the positive direction, otherwise run in the negative direction. If the HSW is OFF→ON when running in the positive direction, switch to low speed. When the HSW is OFF→ON, switch to low speed, and then continue to run in the positive direction to find the nearest Z pulse position as the home position.
5	If the HSW is invalid at the start, run in the negative direction, otherwise run in the positive direction. If the HSW is ON→OFF when running in the positive direction, switch to low speed. When the HSW is ON→OFF, switch to low speed, and then continue to run in the forward direction to find the nearest Z pulse position as the home position.
6	If the HSW is invalid at start, run in the negative direction, otherwise run in the positive direction. When running in negative direction, switch to low speed when HSW When the HSW is ON→OFF, switch to low speed, then continue to run in the negative direction to find the nearest Z pulse position as the home position.
7	If the HSW is invalid at start, run in the positive direction, otherwise run in the negative direction. When running in negative direction, switch to low speed when HSW When the HSW is ON→OFF, switch to low speed, and then continue to run in the negative direction to find the nearest Z pulse position as the home position.
8	If the HSW is invalid at start, run in the positive direction, otherwise run in the negative direction. If the HSW is OFF→ON when running in the positive direction, switch to low speed. When the HSW is OFF→ON, switch to low speed, and then continue to run in the positive direction to find the nearest Z pulse position as the home position.
9	The start is in the positive direction, regardless of whether the HSW is active or inactive. When running in the negative direction, switch to low speed when the HSW When the HSW is OFF→ON, switch to low speed, then continue to run in the negative direction to find the nearest Z pulse position as the home position.
10	The start is in the forward direction, regardless of whether the HSW is active or inactive. When running in the forward direction, switch to low speed when the HSW is ON →OFF state, switch to low-speed operation, and then continue forward operation to find the nearest Z pulse position as the home position.
11	If the HSW is invalid at the start, run in the negative direction, otherwise run in the positive direction. If the HSW is ON→OFF when running in the positive direction, switch to low speed. When the HSW

	is ON→OFF, switch to low speed, and then continue to run in the forward direction to find the nearest Z pulse position as the home position.
12	If the HSW is invalid at start, run in the negative direction, otherwise run in the positive direction. When running in negative direction, switch to low speed when the HSW If the HSW is OFF→ON, switch to low speed, and then continue to run in the negative direction to find the nearest Z pulse position as the home position.
13	The start is in the negative direction, regardless of whether the HSW is active or inactive. When running in the positive direction, switch to low speed when the HSW Then continue to run in the forward direction and find the nearest Z pulse position as the home position.
14	The start is in the negative direction, regardless of whether the HSW is active or inactive. When running in the negative direction, switch to low speed when the HSW is ON →OFF state, then continue to run in the negative direction and find the nearest Z pulse position as the home position.
15	retain
16	retain
17	Similar to method 1, but instead of finding the Z pulse, the OFF→ON state position of NL encountered during negative operation is used as the origin. point
18	Similar to method 2, but instead of looking for a Z pulse, the OFF→ON state position of PL is encountered during forward operation as the home position. point
19	Similar to method 3, but instead of finding the Z pulse, the position of the ON→OFF state of the HSW encountered during negative operation is used as the home position
20	Similar to method 4, but instead of looking for a Z pulse, the OFF→ON state position of the HSW is encountered during forward operation. home position
21	Similar to method 5, but instead of looking for a Z pulse, the position of the ON→OFF state of the HSW encountered during forward operation is used as the home position
22	Similar to method 6, but instead of finding the Z pulse, the OFF→ON state position of the HSW is encountered during negative operation as the home position
23	Similar to method 7, but instead of finding the Z pulse, the position of the ON→OFF state of the HSW is encountered when running in the negative direction as the origin. as the origin
24	Similar to mode 8, but instead of looking for a Z pulse, the OFF→ON state position of the HSW is encountered as the origin when running in the forward direction. as the origin
25	Similar to method 9, but instead of finding the Z pulse, the OFF→ON state position of the HSW is encountered when running in the negative direction as the origin. as the origin
26	Similar to method 10, but without the Z pulse, the position of the ON→OFF state of the HSW is encountered when running in the forward direction. as the origin
27	Similar to method 11, but instead of finding the Z pulse, the position of the ON→OFF state of the HSW is encountered when running in the forward direction. as the origin
28	Similar to mode 12, but without the Z pulse, the OFF→ON state position of the HSW is encountered when running in the negative direction as the origin
29	Similar to method 13, but without the Z pulse, the OFF→ON state position of the HSW is encountered when running in the forward direction. as the origin
30	Similar to mode 14, but without the Z pulse, the ON→OFF state position of the HSW is encountered when running in the negative direction as the origin
31	retain

32	retain
33	Find the nearest Z pulse position in the negative direction as the origin when starting
34	Find the nearest Z pulse position in the forward direction as the origin when starting
35	With the current position as the origin

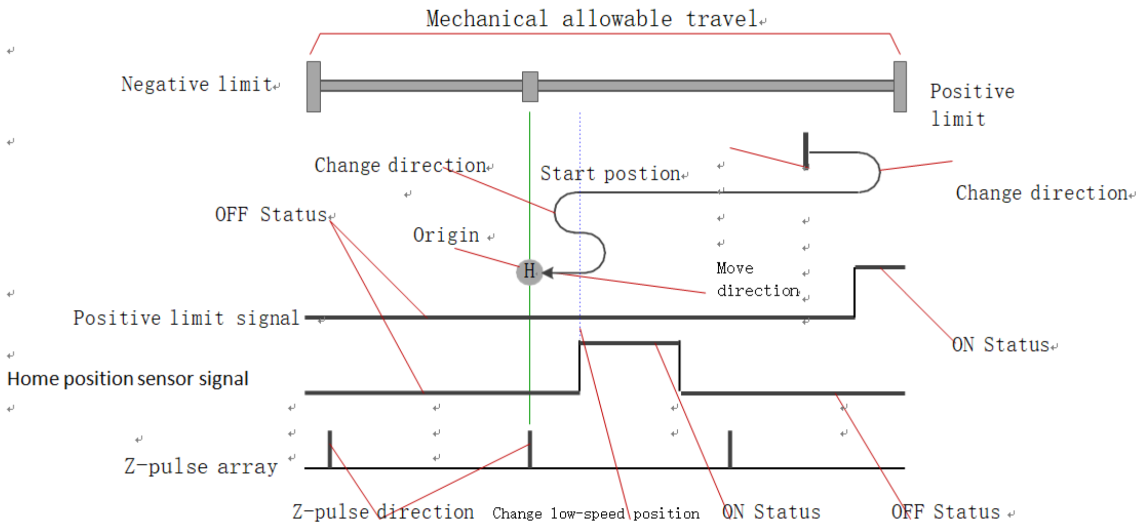


Chart 9-1Back to the original mode various icons meaning

In general, it is recommended that home modes 3 to 6 and 19 to 22 be applied to situations where the OFF/ON state of the HSW splits the entire mechanical allowable travel range into two parts, because these 8 modes stop and alarm whenever NL or PL is encountered, and do not automatically reverse to find the home point.

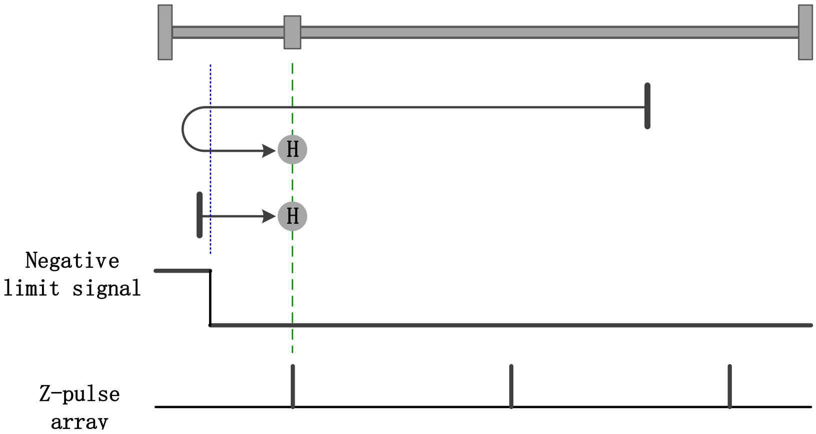
It is proposed to apply the origin modes 7~14 and 23~30 to the case where the ON state of HSW exactly divides the entire mechanical allowable travel range into three parts, when the ON state interval occupies only a small part of the entire mechanical allowable travel range (i.e., the ON state is a short-time transient).

The above is only a suggestion, not a mandate.

Mode 1, Looking for negative limits and Z pulses

If NL is invalid at the start, run in the negative direction at high speed, slow down and stop after encountering the OFF→ON state of NL, and then change to run in the positive direction at low speed. After running in the positive direction at low speed and encountering the ON→OFF state of NL, continue to run in the positive direction to find the nearest Z pulse position as the home position. If NL is valid at the start, run at low speed toward the forward direction. After encountering the ON→OFF state of NL while running in the forward direction, continue to search for the nearest Z pulse position in the forward direction as the home position.

As 9-19 shown, See Table 8. Introduction to 26 Return to Original Mode.



Char 10-2 Origin mode 1 trajectory and signal state

Mode 2, Looking for positive limits and Z pulses

If the PL is invalid at the start, run in the positive direction at high speed, slow down and stop after encountering the OFF→ON state of the PL, and then change to run in the negative direction at low speed. After the PL ON→OFF state is encountered while running in the negative direction at low speed, continue to search for the nearest Z pulse position in the negative direction as the home position. If PL is valid at the start, run in the negative direction at a low speed. After encountering the ON→OFF state of PL while running in the negative direction, continue to search for the nearest Z pulse position in the negative direction as the home position.

As 10-20 shown, See Table 8. Introduction to 26 Return to Original Mode.

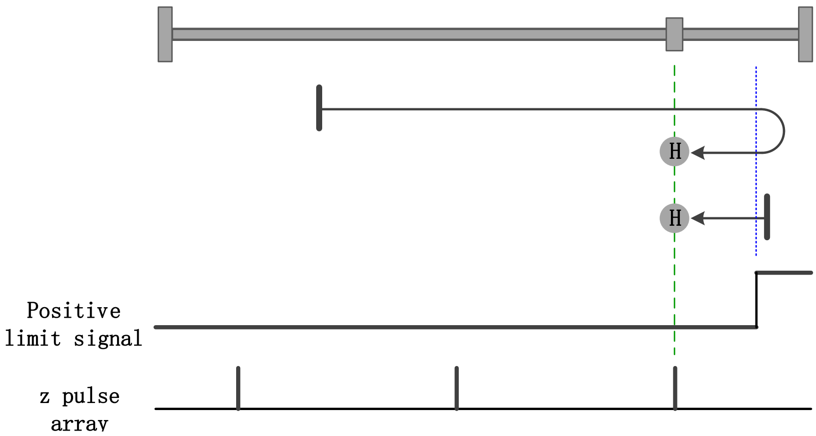


Chart 10-3 Origin mode 2 trajectory and signal state

Mode 3, Finding the ON→OFF position of HSW and Z pulse when running in the negative direction

If the HSW is invalid at the start, it runs in the positive direction at high speed, and then decelerates and stops after encountering the OFF→ON state of the HSW in the positive direction, and then changes to low speed and runs in the negative direction. When the HSW ON→OFF state is encountered in the negative direction at low speed, it continues to search for the nearest Z pulse position in the negative direction as the home position.

If HSW is active at the start, run at high speed in the negative direction. When the HSW is ON→OFF in the negative direction, decelerate and stop, then decelerate and stop again when the HSW is valid at high speed, and then change to low speed and run in the negative direction. After encountering the ON→OFF state of HSW in the negative direction at low speed, continue to search for the nearest Z pulse position in the negative direction as the home position.

This mode stops the return to home process and alarms, whether it encounters the ON state of NL or PL.

As 9-21 shown, See Table 8. Introduction to 26 Return to Original Mode.

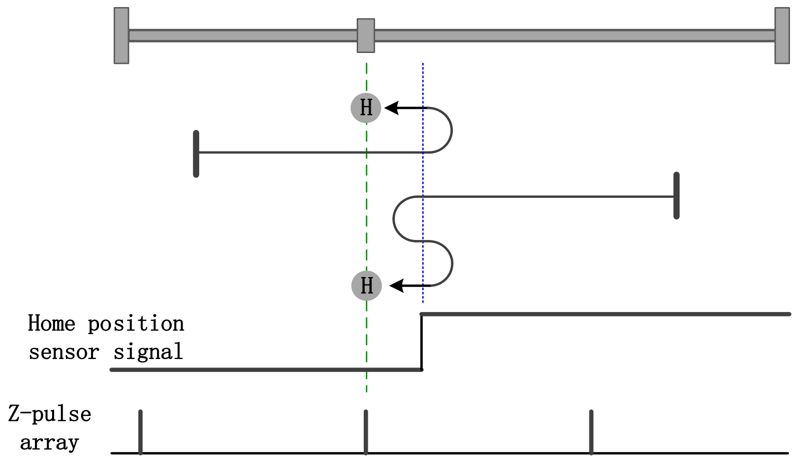


Chart 10-4 Origin mode 3 trajectory and signal state

Mode 4, Finding the OFF→ON position of HSW and Z pulse when running in the forward direction

If the HSW is invalid at the start, run in the forward direction at high speed, slow down and stop after encountering the OFF→ON state of HSW in the forward direction, then slow down and stop again after backing up to the invalid HSW position at high speed, and then change to run in the forward direction at low speed. After encountering the OFF→ON state of HSW during the low-speed forward operation, continue to Find the nearest Z pulse position as the home position in the forward direction.

If HSW is active at the start, run at high speed in the negative direction. When the HSW is ON→OFF in the negative direction, decelerate and stop, and then change to low speed to run in the positive direction. When the HSW is OFF→ON at low speed in the positive direction, continue to Find the nearest Z pulse position in the positive direction as the home position.

This mode stops the return to home process and alarms, whether it encounters the ON state of NL or PL.

As 10-22 shown, See Table 8. Introduction to 26 Return to Original Mode.

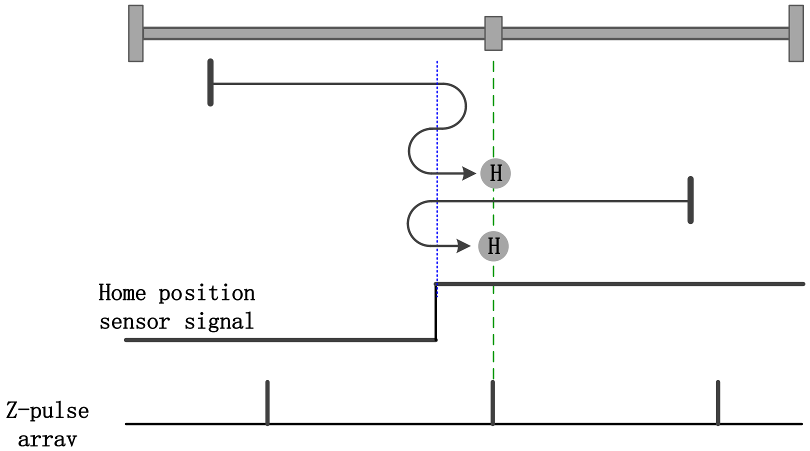


Chart 10-5 Origin mode 4 trajectory and signal state

Mode 5, Finding the ON→OFF position of HSW and Z pulse when running in the forward direction

If the HSW is invalid at the start, run in the negative direction at high speed. When the HSW is OFF→ON in the negative direction, decelerate and stop, and then change to low speed to run in the positive direction. When the HSW ON→OFF state is encountered in the low-speed forward operation, continue to find the nearest Z pulse position in the positive direction as the home position.

If the HSW is valid at the start, run in the forward direction at high speed, slow down and stop after encountering the ON→OFF state of the HSW in the forward direction, then slow down and stop again after retreating to the HSW valid position at high speed, and then change to run in the forward direction at low speed. After encountering the ON→OFF state of HSW during the low-speed forward operation, continue to find the nearest Z pulse position as the home position in the forward direction.

This mode stops the return to home process and alarms, whether it encounters the ON state of NL or PL.

As 10-23 shown, See Table 8. Introduction to 26 Return to Original Mode.

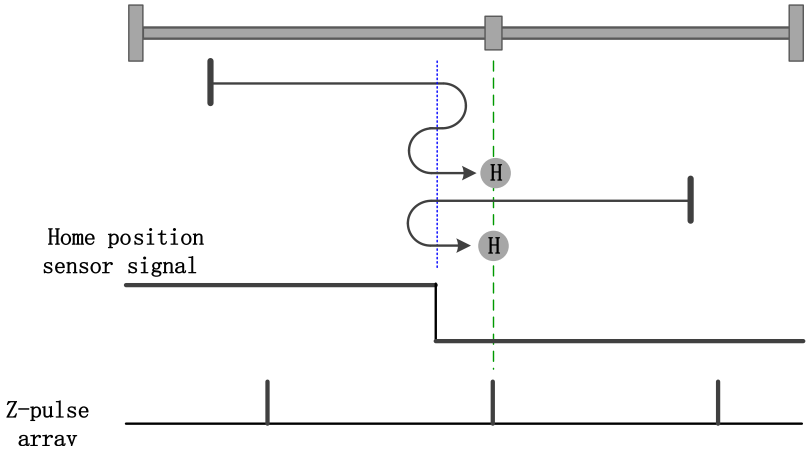


Chart 10-6 Origin mode 5 trajectory and signal shape

Mode 6, Looking for the OFF→ON position of HSW and Z pulse when running in the negative direction

If the HSW is invalid at the start, run in the negative direction at high speed. When the HSW is OFF→ON during negative direction operation, decelerate and stop, then decelerate and stop again after retreating to the HSW invalid position at high speed, and then change to low speed to run in the negative direction. After encountering the OFF→ON state of HSW in the negative direction at low speed, continue to find the nearest Z pulse position as the home position in the negative direction.

If the HSW is valid at the start, run in the positive direction at high speed, and then slow down and stop after encountering the ON→OFF state of the HSW in the positive direction, and then change to low speed and run in the negative direction. When the HSW turns OFF→ON in the negative direction at low speed, continue to run in the negative direction and find the nearest Z pulse position as the home position.

This mode stops the return to home process and alarms, whether it encounters the ON state of NL or PL.

As Chart 9-24 shown, See Table 8. Introduction to 26 Return to Original Mode.

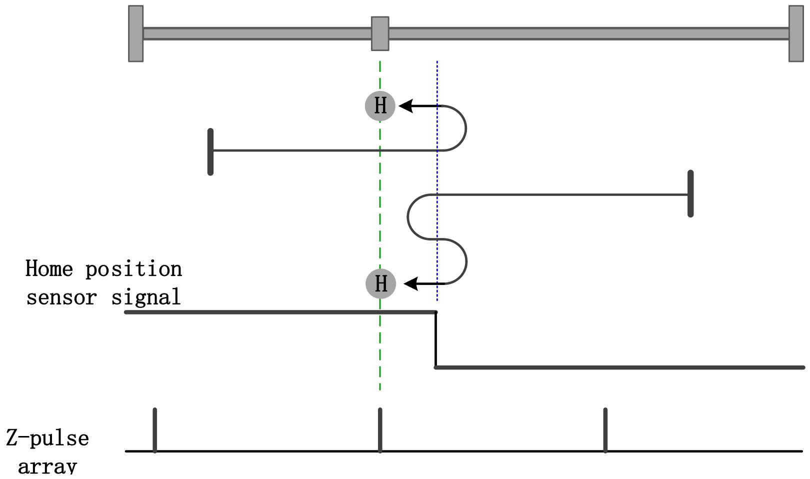


Chart 10-7 Origin mode 6 trajectory and signal state

Mode 7, Looking for the ON→OFF position and Z pulse of HSW when running in the negative direction, and automatically reversing when positive limit is encountered

If the HSW is invalid at the start and is on the positive side of the home position sensor, run at high speed in the positive direction, slow down and stop when it encounters the ON state of the PL, and then run at high speed in the negative direction. When running in the negative direction, decelerate and stop after encountering the ON→OFF state of HSW, then decelerate and stop again after retreating to the HSW valid position at high speed (if the HSW valid interval is narrow, it may enter the HSW invalid position interval on the other side), and then change to run in the negative direction at low speed. After encountering the ON→OFF state of HSW while running in the negative direction at low speed, continue to find the nearest Z pulse position in the negative direction as the home position.

If the HSW is invalid at the start and is on the negative side of the home position sensor, run in the positive direction at high speed, slow down and stop after encountering the OFF→ON state of the HSW in the positive direction, and then change to low speed and run in the negative direction. After encountering the ON→OFF state of HSW in the negative direction at low speed, continue to find the nearest Z pulse position in the negative direction as the home position.

If the HSW is valid at the start, run at high speed in the negative direction. When running in the negative direction, slow down and stop after encountering the ON→OFF state of HSW, then slow down and stop again after retreating to the HSW valid position at high speed (if the HSW valid interval is narrow, it may enter the HSW invalid position interval on the other side), and then change to low speed to run in the negative direction. After encountering the ON→OFF state of HSW while running in the negative direction at low speed, continue to find the nearest Z pulse position in the negative direction as the home position.

In this mode, the first time the ON state of PL is encountered towards forward operation is automatically reversed; when the ON state of NL is encountered, or when the ON state of PL is encountered again, the flow back to the home position is stopped and an alarm is sounded.

As Chart 9-25 shown, See Table 8. Introduction to 26 Return to Original Mode.

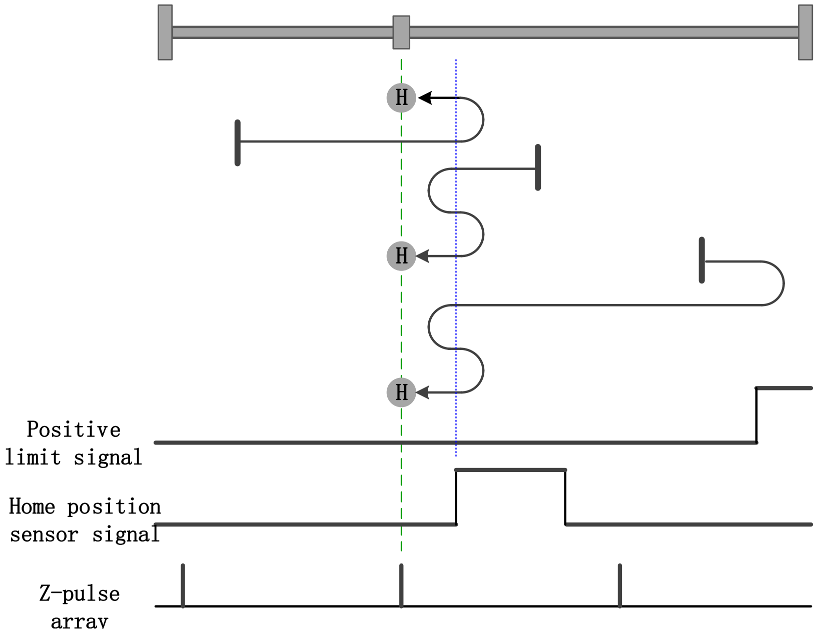


Chart 10-8 Origin mode 7 trajectory and signal state

Mode 8, Find the OFF→ON position and Z pulse of HSW when running in the forward direction, and automatically reverse when positive limit is encountered

If the HSW is invalid at the start and is on the positive side of the home position sensor, run in the positive direction at high speed, decelerate and stop when it encounters the ON state of the PL, and then run in the negative direction at high speed. When the negative direction operation encounters the ON→OFF state of HSW, decelerate and stop, and then change to the low speed operation towards the positive direction. After encountering the OFF→ON state of HSW while running in the positive direction at low speed, continue to search for the nearest Z pulse position as the home position in the positive direction.

If the HSW is invalid at the start and is on the negative side of the home position sensor, run in the forward direction at high speed, and then slow down and stop after encountering the OFF→ON state of the HSW in the forward direction, then slow down and stop again after backing up to the invalid HSW position at high speed, and then change to run in the forward direction at low speed. After encountering the OFF→ON state of HSW while running in the forward direction at low speed, continue to search for the nearest Z pulse position in the forward direction as the home position.

If HSW is active at the start, run at high speed in the negative direction. When the HSW is ON→OFF in the negative direction, decelerate and stop, and then change to low speed to run in the positive direction. When the HSW OFF→ON state is encountered in the low-speed forward operation, continue to search for the nearest Z pulse position in the positive direction as the home position.

In this mode, the first time the ON state of PL is encountered towards forward operation is automatically reversed; when the ON state of NL is encountered, or when the ON state of PL is encountered again, the flow back to the home position is stopped and an alarm is generated.

As Chart 9-26 shown, See Table 8. Introduction to 26 Return to Original Mode.

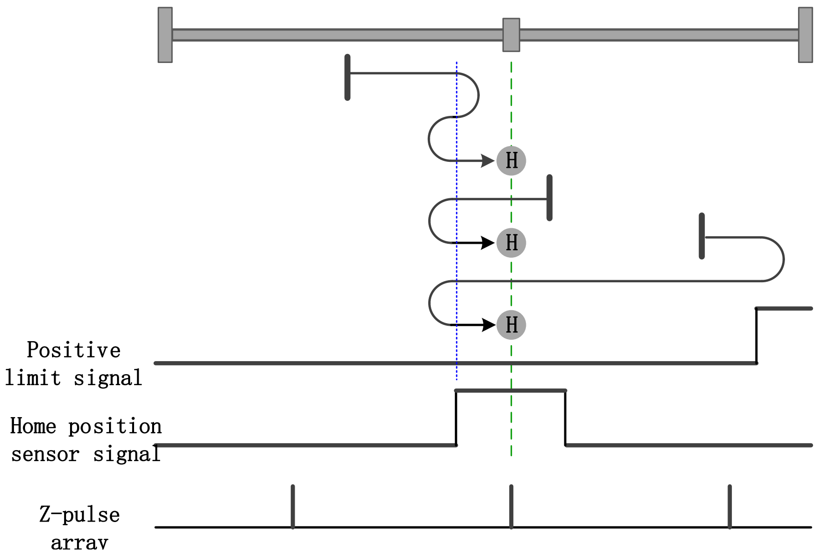


Chart 10-9 Origin mode 8 trajectory and signal state

Mode 9, Looking for the OFF→ON position and Z pulse of HSW when running in the negative direction, and automatically reversing when positive limit is encountered

If the HSW is invalid at the start and is on the positive side of the home position sensor, run in the positive direction at high speed, slow down and stop when the PL is ON, and then run in the negative direction at high speed. When the negative direction operation encounters the OFF→ON state of HSW, decelerate and stop, then decelerate and stop again after retreating to the position where HSW is invalid at high speed, and then change to low speed operation towards the negative direction. After encountering the OFF→ON state of HSW while running in the negative direction at low speed, continue to find the nearest Z pulse position in the negative direction as the home position.

If the HSW is invalid at the start and is on the negative side of the home position sensor, run in the positive direction at high speed, slow down and stop after encountering the ON→OFF state of the HSW in the positive direction, and then change to low speed and run in the negative direction. After encountering the OFF→ON state of HSW in the negative direction at low speed, continue to find the nearest Z pulse position in the negative direction as the home position.

If HSW is active at the start, run at high speed in the positive direction. When the HSW ON→OFF state is encountered in the positive direction, decelerate and stop, and then change to low speed to run in the negative direction. When the HSW is OFF→ON at low speed in negative direction, continue to find the nearest Z pulse position as the home position in negative direction.

In this mode, the first time the ON state of PL is encountered towards forward operation is automatically reversed; when the ON state of NL is encountered, or when the ON state of PL is encountered again, the flow back to the home position is stopped and an alarm is sounded.

As Chart 9-27 shown, See Table 8. Introduction to 26 Return to Original Mode.

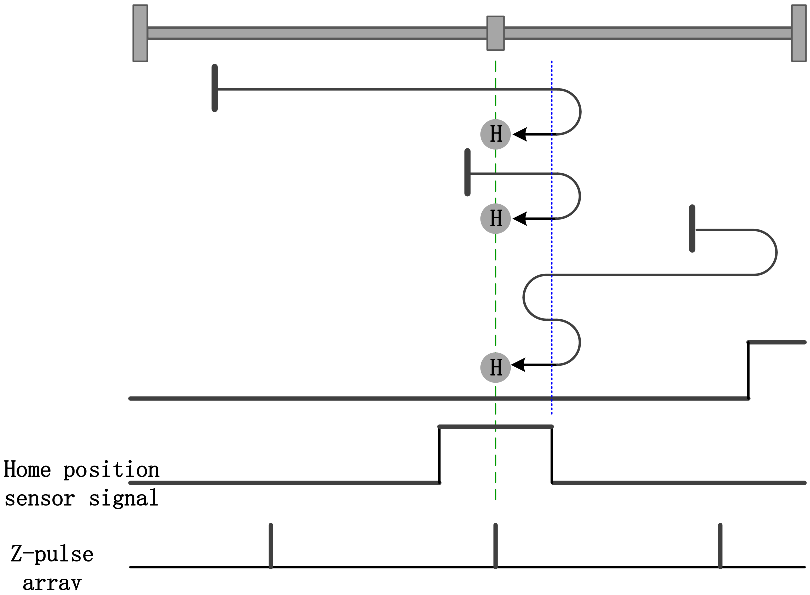


Chart 10-10 Origin mode 9 trajectory and signal state

Mode 10, Find the ON→OFF position and Z pulse of HSW when running in the forward direction, and automatically reverse when positive limit is encountered

If the HSW is invalid at the start and is on the positive side of the home position sensor, run at high speed in the positive direction, decelerate and stop when it encounters the ON state of the PL, and then run at high speed in the negative direction. When the negative direction operation encounters the OFF→ON state of HSW, decelerate and stop, and then switch to the low speed operation towards the positive direction. After encountering the ON→OFF state of HSW while running in the positive direction at low speed, continue to find the nearest Z pulse position as the home position in the positive direction.

If the HSW is invalid at the start and is on the negative side of the home position sensor, run in the forward direction at high speed, slow down and stop after encountering the ON→OFF state of the HSW in the forward direction, then slow down and stop again after returning to the valid HSW position at high speed (if the valid HSW range is narrow, it may enter the invalid HSW range on the other side), and then change to low speed and run in the forward direction. After that, change to low speed towards forward. After encountering the ON→OFF state of HSW during the low-speed forward operation, continue to find the nearest Z pulse position as the home position in the forward direction.

If the HSW is valid at the start, run at high speed in the forward direction. When the HSW ON→OFF state is encountered during forward operation, decelerate and stop, and then decelerate and stop again after retreating to the HSW valid position at high speed (if the HSW valid interval is narrow, it may enter the HSW invalid position interval on the other side), and then change to low speed to run in the forward direction. After encountering the ON→OFF state of HSW while running in the forward direction at low speed, continue to find the nearest Z pulse position in the forward direction as the home position.

In this mode, the first time the ON state of PL is encountered towards forward operation is automatically reversed; when the ON state of NL is encountered, or when the ON state of PL is encountered again, the flow back to the home position is stopped and an alarm is sounded.

As Chart 9-28 shown, See Table 8. Introduction to 26 Return to Original Mode.

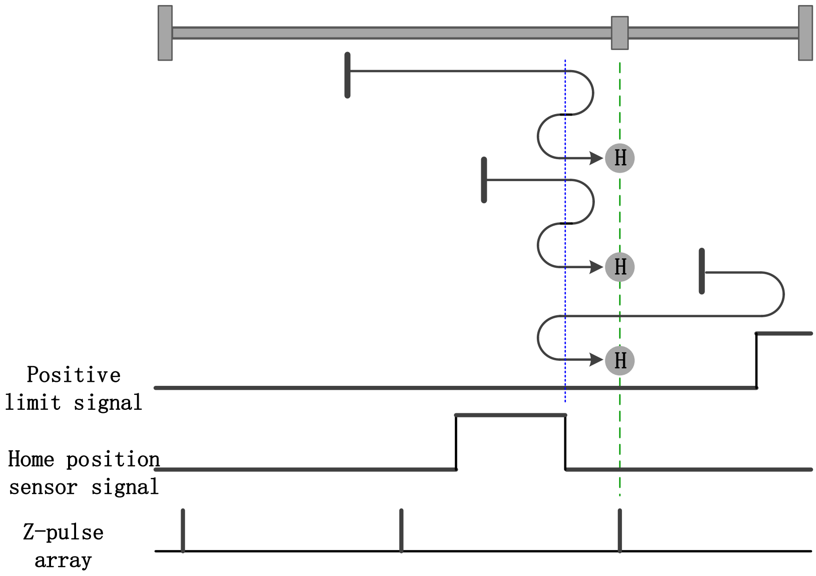


Chart 10-11 Origin mode 10 trajectory and signal state

Mode 11, Find the ON→OFF position and Z pulse of HSW when running in the positive direction, and automatically reverse when negative limit is encountered

If the HSW is invalid at the start and is located on the positive side of the home position sensor, run in the negative direction at high speed, slow down and stop after encountering the OFF→ON state of the HSW in the negative direction, and then change to low speed and run in the positive direction. After encountering the ON→OFF state of HSW at low speed in the positive direction, continue to find the nearest Z pulse position as the home position in the positive direction.

If the HSW is invalid at the start and is on the negative side of the home position sensor, run at high speed in the negative direction, slow down and stop when it encounters the ON state of NL, and then run at high speed in the positive direction. When running in the positive direction, slow down and stop after encountering the ON→OFF state of HSW, then slow down and stop again after retreating to the valid HSW position at high speed (if the valid HSW interval is narrow, it may enter the position interval of the invalid HSW on the other side), and then change to run in the positive direction at low speed. After encountering the ON→OFF state of HSW while running in the forward direction at low speed, continue to find the nearest Z pulse position in the forward direction as the home position.

If the HSW is valid at the start, run at high speed in the forward direction. When the HSW ON→OFF state is encountered during forward operation, decelerate and stop, and then decelerate and stop again after retreating to the HSW valid position at high speed (if the HSW valid interval is narrow, it may enter the HSW invalid position interval on the other side), and then change to low speed to run in the forward direction. After encountering the ON→OFF state of HSW while running in the forward direction at low speed, continue to find the nearest Z pulse position in the forward direction as the home position.

In this mode, operation in the negative direction is automatically reversed the first time the ON state of NL is encountered; when the ON state of PL is encountered, or when the ON state of NL is encountered again, the flow back to the origin is stopped and an alarm is sounded.

AsChart 9-29 shown, See Table 8. Introduction to 26 Return to Original Mode.

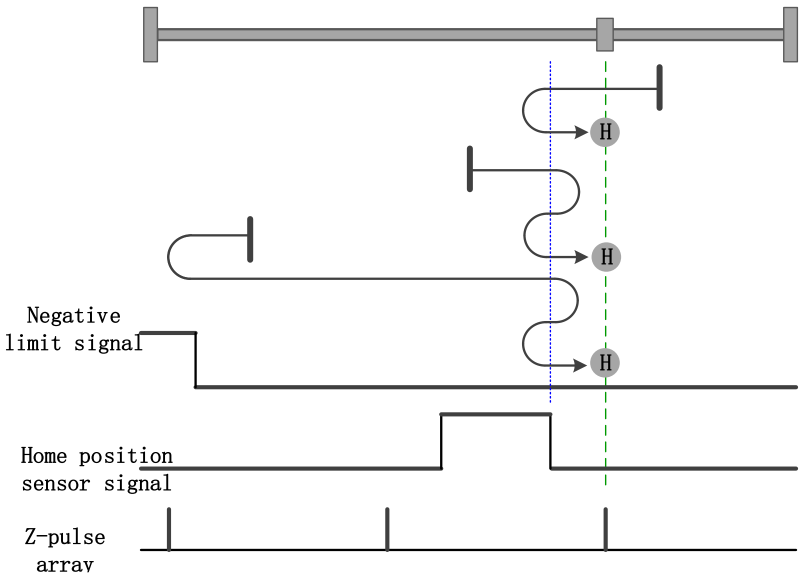


Chart 10-12 Origin mode 11 trajectory and signal state

Mode 12, Find the OFF→ON position and Z pulse of HSW when running in the negative direction, and automatically reverse when negative limit is encountered

If the HSW is invalid at the start and is located on the positive side of the home position sensor, run in the negative direction at high speed, slow down and stop after encountering the OFF→ON state of the HSW in the negative direction, then slow down and stop again after backing up to the invalid HSW position at high speed, and then change to run in the negative direction at low speed. After encountering the OFF→ON state of HSW when running in the negative direction at low speed, continue to find the nearest Z pulse position in the negative direction as the home position.

If the HSW is invalid at the start and is on the negative side of the home position sensor, run at high speed in the negative direction, slow down and stop when it encounters the ON state of NL, and then run at high speed in the positive direction. When it encounters the ON→OFF state of HSW while running in the positive direction, decelerate and stop, and then change to low speed to run in the negative direction. After encountering the OFF→ON state of HSW while running in the negative direction at low speed, continue to find the nearest Z pulse position in the negative direction as the home position.

If HSW is active at the start, run at high speed in the positive direction. When the HSW ON→OFF state is encountered in the positive direction, decelerate and stop, and then change to low speed to run in the negative direction. When the HSW is OFF→ON at low speed in negative direction, continue to find the nearest Z pulse position as the home position in negative direction.

In this mode, operation in the negative direction is automatically reversed the first time the ON state of NL is encountered; when the ON state of PL is encountered, or when the ON state of NL is encountered again, the flow back to the origin is stopped and an alarm is sounded.

AsChart 9-30 shown, See Table 8. Introduction to 26 Return to Original Mode.

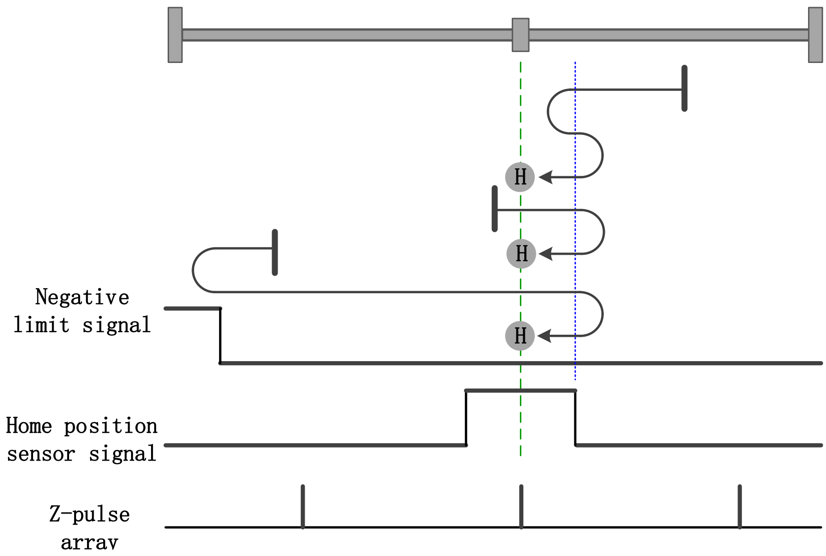


Chart 10-13 Origin mode 12 trajectory and signal state

Mode 13, Find the OFF→ON position and Z pulse of HSW when running in the positive direction, and automatically reverse when negative limit is encountered

If the HSW is invalid at the start and is located on the positive side of the home position sensor, run in the negative direction at high speed, slow down and stop after encountering the ON→OFF state of the HSW in the negative direction, and then change to low speed and run in the positive direction. After encountering the OFF→ON state of HSW during the low-speed forward operation, continue to find the nearest Z pulse position as the home position in the forward direction.

If the HSW is invalid at the start and is on the negative side of the home position sensor, run in the negative direction at high speed, slow down and stop when it encounters the ON state of NL, and then run in the positive direction at high speed. When it encounters the OFF→ON state of HSW during forward operation, it decelerates and stops, and then decelerates and stops again after returning to the position where HSW is invalid at high speed, and then changes to low speed to run in the positive direction. After encountering the OFF→ON state of HSW while running in the forward direction at low speed, continue to find the nearest Z pulse position in the forward direction as the home position.

If HSW is active at the start, run at high speed in the negative direction. When the HSW is ON→OFF in the negative direction, decelerate and stop, and then change to low speed to run in the positive direction. When the HSW is OFF→ON at low speed in the positive direction, continue to find the nearest Z pulse position in the positive direction as the home position.

In this mode, operation in the negative direction is automatically reversed the first time the ON state of NL is encountered; when the ON state of PL is encountered, or when the ON state of NL is encountered again, the flow back to the origin is stopped and an alarm is sounded.

As Chart 9-31 shown, See Table 8. Introduction to 26 Return to Original Mode.

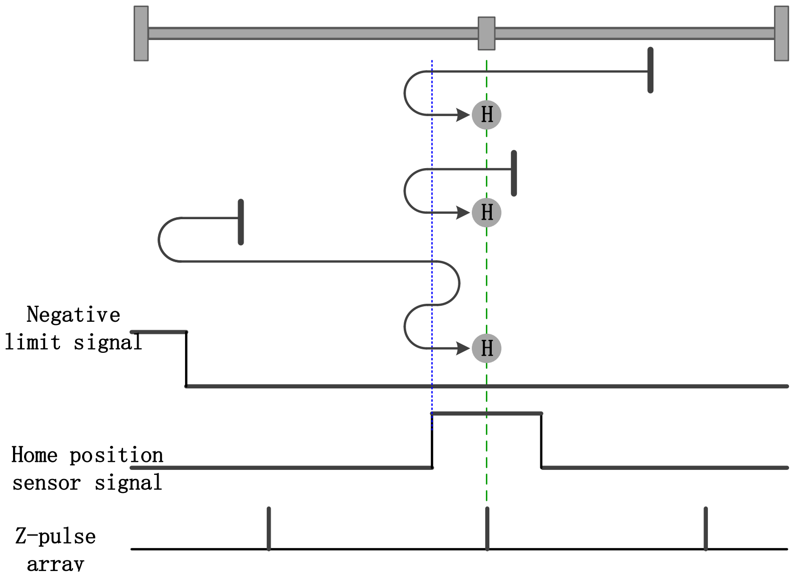


Chart 10-14 Origin mode 13 trajectory and signal state

Mode 14, Find the ON→OFF position and Z pulse of HSW when running in the negative direction, and automatically reverse when negative limit is encountered

If the HSW is invalid at the start and is on the positive side of the home position sensor, run at high speed in the negative direction, then slow down and stop after encountering the ON→OFF state of the HSW in the negative direction, then slow down and stop again after returning to the HSW valid position at high speed (if the HSW valid range is narrow, it may enter the HSW invalid range on the other side), then change to low speed and run in the negative direction. After that, change to low speed towards negative direction. After encountering the ON→OFF state of HSW when running in the negative direction at low speed, continue to find the nearest Z pulse position in the negative direction as the home position.

If the HSW is invalid at the start and is on the negative side of the home position sensor, run at high speed in the negative direction, slow down and stop when it encounters the ON state of NL, and then run at high speed in the positive direction. When it encounters the OFF→ON state of HSW while running in the positive direction, decelerate and stop, and then change to low speed to run in the negative direction. After encountering the ON→OFF state of HSW while running in the negative direction at low speed, continue to find the nearest Z pulse position in the negative direction as the home position.

If the HSW is valid at the start, run at high speed in the negative direction. When running in the negative direction, slow down and stop after encountering the ON→OFF state of HSW, then slow down and stop again after retreating to the HSW valid position at high speed (if the HSW valid interval is narrow, it may enter the HSW invalid position interval on the other side), and then change to low speed to run in the negative direction. After encountering the ON→OFF state of HSW while running in the negative direction at low speed, continue to find the nearest Z pulse position in the negative direction as the home position.

This mode automatically reverses the first time the ON state of NL is encountered when running in the negative direction; when the ON state of PL is encountered, or when the ON state of NL is encountered again, the return home process is stopped and an alarm is generated.

AsChart 9-32 shown, See Table 8. Introduction to 26 Return to Original Mode.

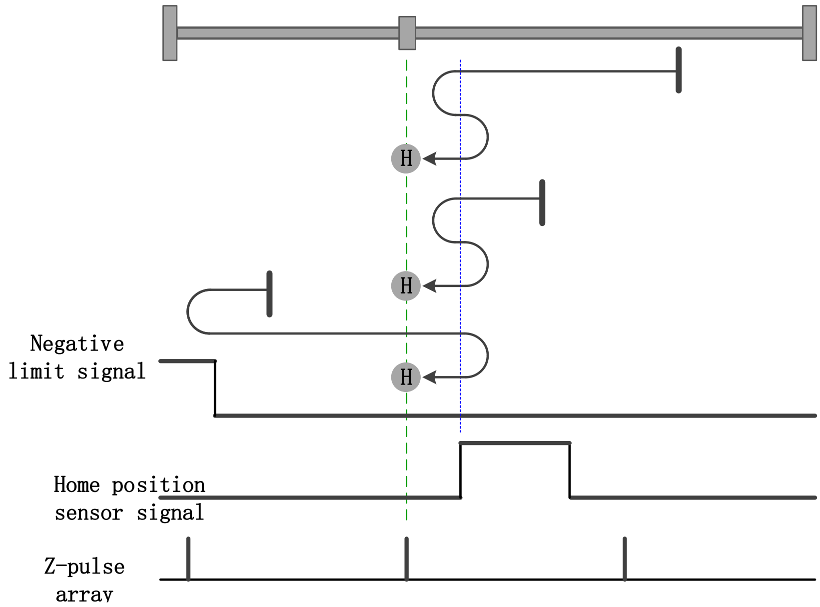


Chart 10-15 Origin mode 14 trajectory and signal state

Mode 15, Reserved, please do not set.

Mode 16, Reserved, please do not set.

Mode 17, Finding Negative Limits

If NL is invalid at the start, run in the negative direction at high speed, decelerate and stop when it encounters the OFF→ON state of NL, and then change to run in the positive direction at low speed. Decelerate and stop when running at low speed toward positive direction and meet the ON→OFF state of NL, and use the stop position as the home position.

If NL is valid at the start, run at low speed toward the forward direction. Decelerate and stop at the ON→OFF state of NL encountered in forward operation, using the stop position as the home position.

AsChart 9-33 shown, See Table 8. Introduction to 26 Return to Original Mode.

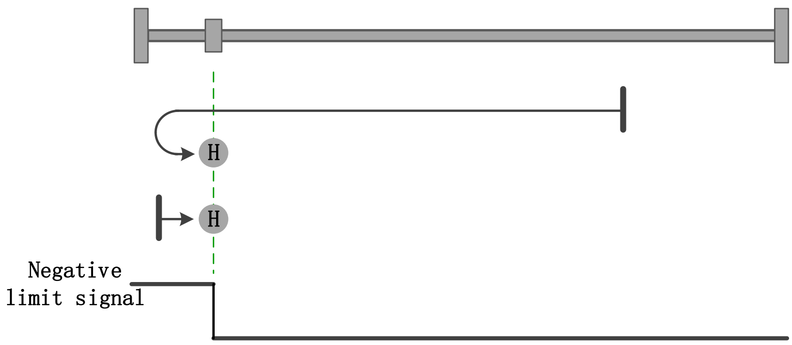


Chart 10-16 Origin mode 17 trajectory and signal state

Mode 18, Finding Positive Limits

If PL is invalid at the start, run in the positive direction at high speed, decelerate and stop when it encounters the OFF→ON state of PL, and then change to run in the negative direction at low speed. When the low speed running in the negative direction encounters the ON→OFF state of PL, decelerate and stop, and use the stop position as the home position.

If PL is active at the start, run at low speed in the negative direction. When running at low speed in the negative direction, deceleration stops when the ON→OFF state of PL is encountered, and the stop position is used as the home position.

AsChart 9-34 shown, See Table 8. Introduction to 26 Return to Original Mode.

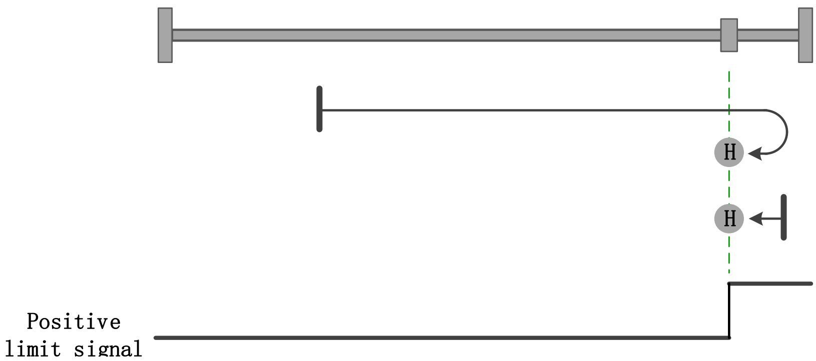


Chart 10-17 Origin mode 18 trajectory and signal state

Mode 19, Find the ON→OFF position of HSW when running in the negative direction

If the HSW is invalid at the start, it runs in the positive direction at high speed, and then decelerates and stops when it encounters the OFF→ON state of the HSW in the positive direction, and then changes to low speed and runs in the negative direction. When the HSW ON→OFF state is encountered in the negative direction at low speed, decelerate and stop, and use the stop position as the home position.

If HSW is active at the start, it runs in the negative direction at high speed. After decelerating and stopping in the negative direction when the HSW ON→OFF state is encountered, then decelerating and stopping again after returning to the HSW valid position at high speed, and then switching to low speed to run in the negative direction. When the negative direction operation at low speed encounters the ON→OFF state of HSW, decelerate and stop, using the stop position as the home position. In this mode, whether it encounters the ON state of NL or PL, it is stopped back to the home process and alarmed.

As Chart 9-35 shown, See Table 8. Introduction to 26 Return to Original Mode.

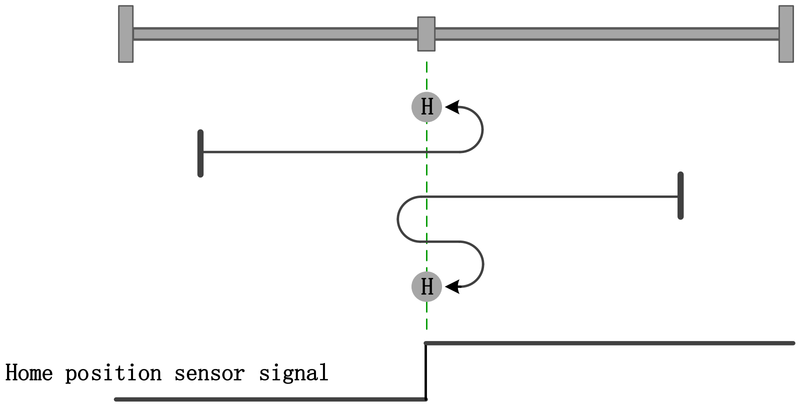


Chart 10-18 Origin mode 19 trajectory and signal state

Mode 20, Find the OFF→ON position of HSW when running in the forward direction

If the HSW is invalid at the start, run in the forward direction at high speed, and then decelerate and stop when the HSW OFF→ON state is encountered in the forward direction, and then decelerate and stop again when the HSW is invalid at high speed, and then change to low speed and run in the forward direction. When the low-speed forward operation encounters the OFF→ON state of HSW, decelerate and stop, and use the stop position as the home position.

If HSW is active at the start, run at high speed in the negative direction. When the HSW ON→OFF state is encountered in the negative direction, deceleration is stopped, and then the speed is changed to low speed to run in the positive direction. Decelerate and stop when the low-speed forward operation encounters the OFF→ON state of HSW, and use the stop position as the home position.

This mode stops the return to home process and alarms, whether it encounters the ON state of NL or PL.

As Chart 9-36 shown, See Table 8. Introduction to 26 Return to Original Mode.

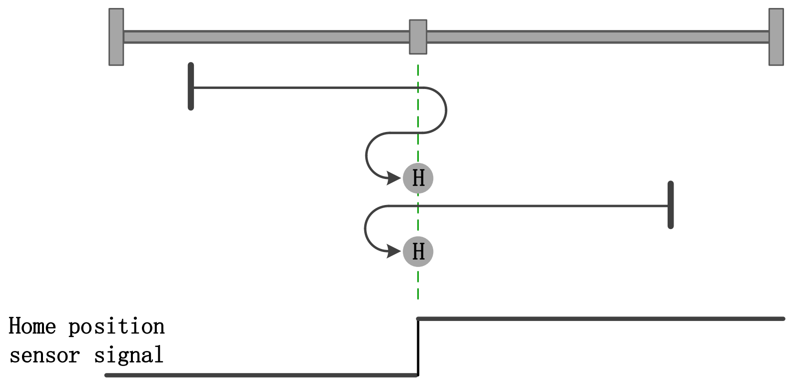


Chart 10-19 Origin mode 20 trajectory and signal state

Mode 21, Find the ON→OFF position of HSW when running in the forward direction

If the HSW is invalid at the start, run in the negative direction at high speed. After decelerating and stopping when the HSW OFF→ON state is encountered in the negative direction, the speed is switched to low speed to run in the positive direction. Decelerate and stop when the low-speed forward operation meets the ON→OFF state of HSW, and use the stop position as the home position.

If the HSW is active at the start, it runs in the forward direction at high speed, decelerates and stops when it encounters the ON→OFF state of the HSW in the forward direction, then decelerates and stops again when it returns to the active HSW position at high speed, and then changes to low speed to run in the forward direction. When the low-speed forward operation encounters the ON→OFF state of HSW, decelerate and stop, and use the stop position as the home position.

This mode stops the return to home process and alarms, whether it encounters the ON state of NL or PL.

As 1Chart 9-37 shown, See Table 8. Introduction to 26 Return to Original Mode.

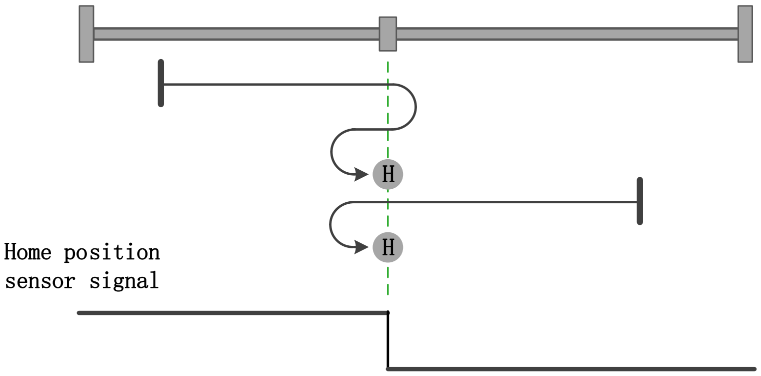


Chart 10-20 Origin mode 21 trajectory and signal state

Mode 22, Looking for the OFF→ON position of HSW when operating in the negative direction

If the HSW is invalid at the start, run in the negative direction at high speed. When the HSW OFF→ON state is encountered in the negative direction, deceleration is stopped, and then deceleration is stopped again when the HSW OFF→ON state is encountered in the negative direction, and then the HSW OFF→ON state is encountered in the negative direction. When the negative direction operation at low speed encounters the OFF→ON state of HSW, decelerate and stop, and use the stop position as the home position.

If the HSW is active at the start, it runs in the positive direction at high speed, and then decelerates and stops when it encounters the ON→OFF state of the HSW in the positive direction, and then changes to low speed and runs in the negative direction. When the HSW OFF→ON state is encountered in the negative direction at low speed, decelerate and stop, and use the stop position as the home position.

This mode stops the return to home process and alarms, whether it encounters the ON state of NL or PL.

AsChart 9-38 shown, See Table 8. Introduction to 26 Return to Original Mode.

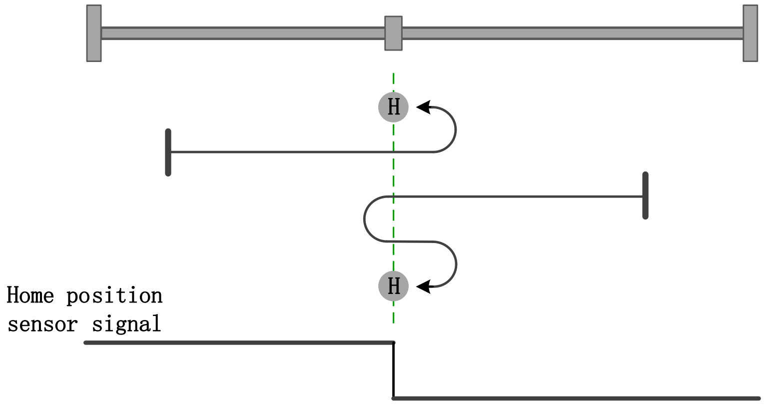


Chart 10-21 Origin mode 22 trajectory and signal state

Mode 23, Looking for the ON→OFF position of HSW when running in the negative direction, and automatically reversing when positive limit is encountered

If the HSW is invalid at the start and is on the positive side of the home position sensor, run at high speed in the positive direction, slow down and stop when it encounters the ON state of the PL, and then run at high speed in the negative direction. In the negative direction, decelerate and stop after encountering the ON→OFF state of HSW, then decelerate and stop again after retreating to the valid HSW position at high speed (if the valid HSW interval is narrow, it may enter the position interval of the invalid HSW on the other side), and then change to low speed to run in the negative direction. Decelerate and stop when the low-speed negative operation meets the ON→OFF of HSW, using the stop position as the home position.

If the HSW is invalid at the start and is on the negative side of the home position sensor, run at high speed in the positive direction, decelerate and stop when the HSW OFF→ON state is encountered in the positive direction, and then change to low speed and run in the negative direction. When the negative direction operation at low speed encounters the ON→OFF state of HSW, decelerate and stop, and use the stop position as the home position.

If the HSW is valid at the start, run at high speed in the negative direction. When running in the negative direction, decelerate and stop after encountering the ON→OFF state of HSW, then decelerate and stop again after retreating to the HSW valid position at high speed (if the HSW valid interval is narrow, it may enter the HSW invalid position interval on the other side), and then change to low speed to run in the negative direction. Decelerate and stop when the low-speed negative operation meets the ON→OFF of HSW, using the stop position as the home position.

In this mode, the first time the ON state of PL is encountered towards forward operation is automatically reversed; when the ON state of NL is encountered, or when the ON state of PL is encountered again, the flow back to the home position is stopped and an alarm is generated.

AsChart 9-39 shown, See Table 8. Introduction to 26 Return to Original Mode.

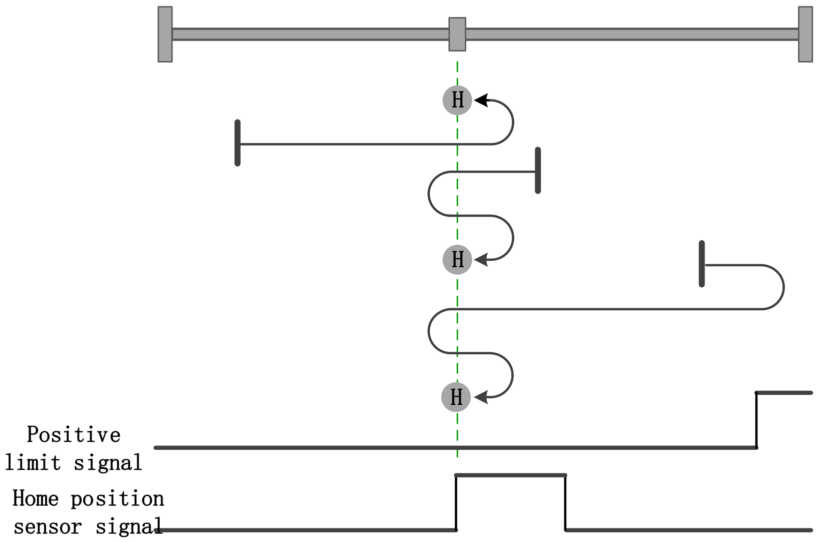


Chart 10-22 Origin mode 23 trajectory and signal state

Mode 24, Looking for the OFF→ON position of HSW when running in the forward direction, and automatically reversing when positive limit is encountered

If the HSW is invalid at the start and is on the positive side of the home position sensor, run in the positive direction at high speed, decelerate and stop when it encounters the ON state of the PL, and then run in the negative direction at high speed. When the negative direction operation encounters the ON→OFF state of HSW, decelerate and stop, and then change to the low speed operation towards the positive direction. Decelerate and stop when the low-speed forward operation encounters the OFF→ON state of HSW, and use the stop position as the home position.

If the HSW is invalid at the start and is on the negative side of the home position sensor, run in the forward direction at high speed, decelerate and stop when the HSW OFF→ON state is encountered in the forward direction, then decelerate and stop again when the HSW is invalid at high speed, and then run in the forward direction at low speed. When the low-speed forward operation encounters the OFF→ON state of HSW, decelerate and stop, and use the stop position as the home position.

If HSW is active at the start, run at high speed in the negative direction. When the HSW ON→OFF state is encountered in the negative direction, deceleration is stopped, and then the speed is changed to low speed to run in the positive direction. Decelerate and stop when the low-speed forward operation encounters the OFF→ON state of HSW, and use the stop position as the home position.

In this mode, the first time the ON state of PL is encountered towards forward operation is automatically reversed; when the ON state of NL is encountered, or when the ON state of PL is encountered again, the flow back to the home position is stopped and an alarm is generated.

AsChart 9-40 shown, See Table 8. Introduction to 26 Return to Original Mode.

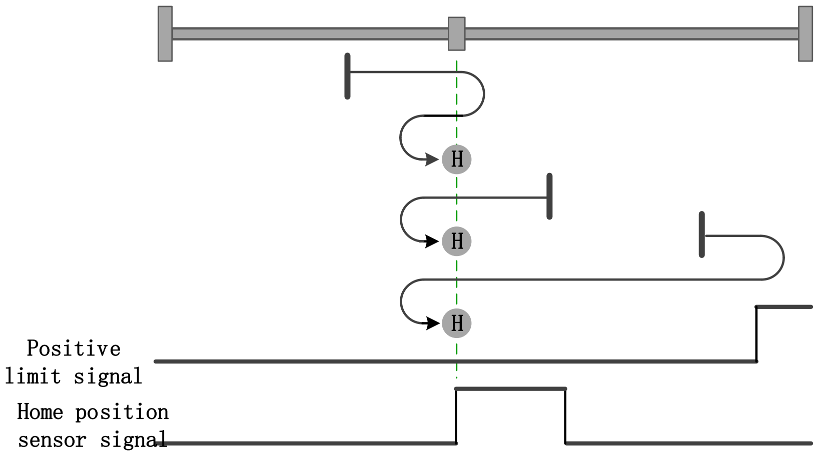


Chart 10-23 Origin mode 24 trajectory and signal state

Mode 25, Looking for the OFF→ON position of HSW when running in the negative direction, and automatically reversing when positive limit is encountered

If the HSW is invalid at the start and is on the positive side of the home position sensor, run in the positive direction at high speed, slow down and stop when the PL is ON, and then run in the negative direction at high speed. When the negative direction operation encounters the OFF→ON state of HSW, decelerate and stop, then decelerate and stop again after retreating to the invalid HSW position at high speed, and then change to low speed operation towards the negative direction. Decelerate and stop when the HSW OFF→ON state is encountered while running in the negative direction at low speed, and use the stop position as the home position.

If the HSW is invalid at the start and is located on the negative side of the home position sensor, run at high speed in the positive direction, decelerate and stop when the ON→OFF state of the HSW is encountered in the positive direction, and then change to low speed and run in the negative direction. When the negative direction operation at low speed encounters the OFF→ON state of HSW, decelerate and stop, and use the stop position as the home position.

If HSW is active at the start, run at high speed in the positive direction. When the HSW ON→OFF state is encountered during forward operation, deceleration is stopped, and then low speed is switched to negative operation. Decelerate and stop when the HSW OFF→ON state is encountered in the negative direction at low speed, and use the stop position as the home position.

In this mode, the first time the ON state of PL is encountered towards forward operation is automatically reversed; when the ON state of NL is encountered, or when the ON state of PL is encountered again, the flow back to the home position is stopped and an alarm is sounded.

AsChart 9-41 shown, See Table 8. Introduction to 26 Return to Original Mode.

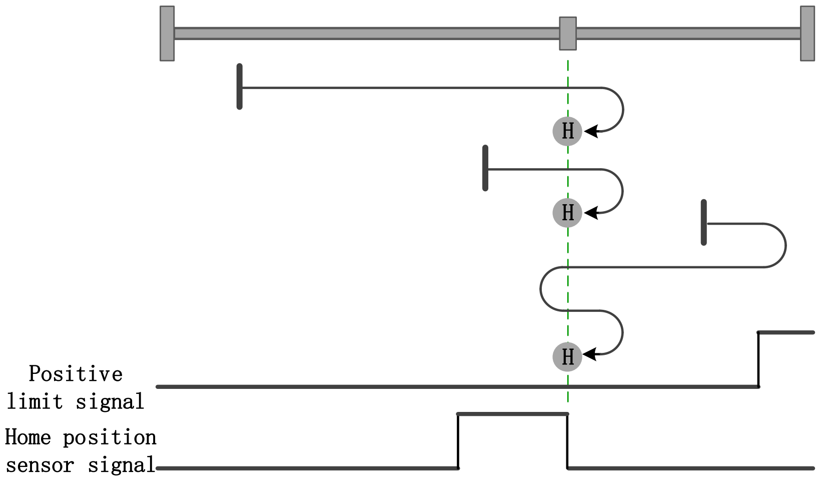


Chart 10-24 Origin mode 25 trajectory and signal state

Mode 26, Finding the ON→OFF position of HSW when running in the forward direction, and automatically reversing when positive limit is encountered

If the HSW is invalid at the start and is on the positive side of the home position sensor, run at high speed in the positive direction, decelerate and stop when it encounters the ON state of the PL, and then run at high speed in the negative direction. When the negative direction operation encounters the OFF→ON state of HSW, decelerate and stop, and then switch to the low speed operation towards the positive direction. Decelerate and stop when the low-speed forward operation meets the ON→OFF state of HSW, and use the stop position as the home position.

If the HSW is invalid at the start and is on the negative side of the home position sensor, run in the forward direction at high speed, slow down and stop after encountering the ON→OFF state of the HSW in the forward direction, then slow down and stop again after returning to the valid HSW position at high speed (if the valid HSW range is narrow, it may enter the invalid HSW range on the other side), and then change to low speed and run in the forward direction. After that, change to low speed towards forward. Decelerate and stop when the low-speed forward operation meets the ON→OFF state of HSW, using the stop position as the home position.

If the HSW is valid at the start, run at high speed in the forward direction. After decelerating and stopping when the HSW ON→OFF state is encountered during forward operation, decelerate and stop again after retreating to the HSW valid position at high speed (if the HSW valid interval is narrow, it may enter the HSW invalid position interval on the other side), and then change to low speed to run in the forward direction. Decelerate and stop when the low-speed forward operation encounters the ON→OFF state of HSW, using the stop position as the home position.

In this mode, the first time the ON state of PL is encountered towards forward operation is automatically reversed; when the ON state of NL is encountered, or when the ON state of PL is encountered again, the flow back to the home position is stopped and an alarm is sounded.

AsChart 9-42 shown, See Table 8. Introduction to 26 Return to Original Mode.

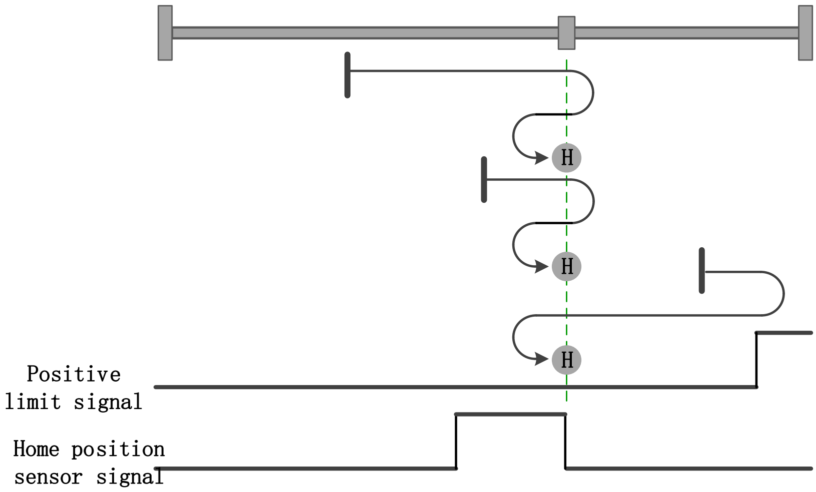


Chart 10-25 Origin mode 26 trajectory and signal state

Mode 27, Find the ON→OFF position of HSW when running in the positive direction, and automatically reverse when it meets the negative limit

If the HSW is invalid at the start and is on the positive side of the home position sensor, run at high speed in the negative direction, decelerate and stop when the HSW OFF→ON state is encountered in the negative direction, and then change to low speed and run in the positive direction. If the HSW ON→OFF state is encountered in low-speed forward operation, decelerate and stop, and use the stop position as the home position.

If the HSW is invalid at the start and is on the negative side of the home position sensor, run at high speed in the negative direction, slow down and stop when it encounters the ON state of NL, and then run at high speed in the positive direction. When running in the positive direction, slow down and stop after encountering the ON→OFF state of HSW, then slow down and stop again after retreating to the valid HSW position at high speed (if the valid HSW interval is narrow, it may enter the position interval of the invalid HSW on the other side), and then change to run in the positive direction at low speed. Decelerate and stop when the low-speed forward operation encounters the ON→OFF state of HSW, using the stop position as the home position.

If the HSW is valid at the start, run at high speed in the forward direction. After decelerating and stopping when the HSW ON→OFF state is encountered during forward operation, decelerate and stop again after retreating to the HSW valid position at high speed (if the HSW valid interval is narrow, it may enter the HSW invalid position interval on the other side), and then change to low speed to run in the forward direction. Decelerate and stop when the low-speed forward operation encounters the ON→OFF state of HSW, using the stop position as the home position.

In this mode, operation in the negative direction is automatically reversed the first time the ON state of NL is encountered; when the ON state of PL is encountered, or when the ON state of NL is encountered again, the flow back to the origin is stopped and an alarm is sounded.

AsChart 9-43 shown, See Table 8. Introduction to 26 Return to Original Mode.

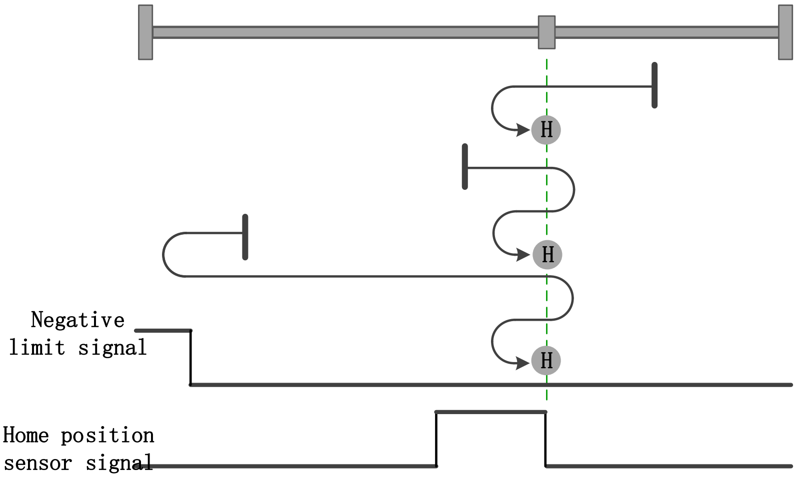


Chart 10-26 Origin mode 27 trajectory and signal state

Mode 28, Looking for the OFF→ON position of HSW when running in the negative direction, and automatically reversing when negative limit is encountered

If the HSW is invalid at the start and is located on the positive side of the home position sensor, run in the negative direction at high speed, decelerate and stop when the HSW OFF→ON state is encountered in the negative direction, then decelerate and stop again after retracing to the invalid HSW position at high speed, and then change to run in the negative direction at low speed. When the low-speed negative operation encounters the OFF→ON state of HSW, decelerate and stop, and use the stop position as the home position.

If the HSW is invalid at the start and is on the negative side of the home position sensor, run at high speed in the negative direction, slow down and stop when it encounters the ON state of NL, and then run at high speed in the positive direction. When it encounters the ON→OFF state of HSW while running in the positive direction, decelerate and stop, and then change to low speed to run in the negative direction. Decelerate and stop when the low-speed negative operation encounters the

OFF→ON state of HSW, and use the stop position as the home position.

If HSW is active at the start, run at high speed in the positive direction. When the HSW ON→OFF state is encountered during forward operation, deceleration is stopped, and then low speed is switched to negative operation. Decelerate and stop when the HSW OFF→ON state is encountered in the negative direction at low speed, and use the stop position as the home position.

In this mode, operation in the negative direction is automatically reversed the first time the ON state of NL is encountered; when the ON state of PL is encountered, or when the ON state of NL is encountered again, the flow back to the origin is stopped and an alarm is sounded.

As Chart 9-44 shown, See Table 8. Introduction to 26 Return to Original Mode.

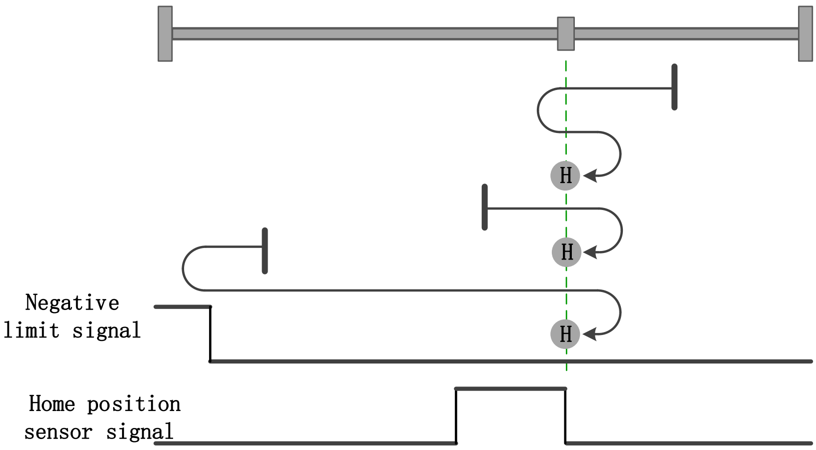


Chart 10-27 Origin mode 28 trajectory and signal state

Mode 29, Find the OFF→ON position of HSW when running in the positive direction, and automatically reverse when negative limit is encountered

If the HSW is invalid at the start and is on the positive side of the home position sensor, run at high speed in the negative direction, decelerate and stop when the HSW ON→OFF state is encountered in the negative direction, and then change to low speed and run in the positive direction. When the low speed positive operation meets the OFF→ON state of HSW, decelerate and stop, and use the stop position as the home position.

If the HSW is invalid at the start and is on the negative side of the home position sensor, run at high speed in the negative direction, slow down and stop when it encounters the ON state of NL, and then run at high speed in the positive direction. When it encounters the OFF→ON state of HSW in the forward direction, it decelerates and stops, and then decelerates and stops again when it returns to the position where HSW is invalid at high speed, and then changes to low speed to run in the forward direction. Decelerate and stop when the low-speed forward operation encounters the OFF→ON state of HSW, and use the stop position as the home position.

If HSW is active at the start, run at high speed in the negative direction. When the HSW ON→OFF state is encountered in the negative direction, deceleration is stopped, and then the speed is changed to low speed to run in the positive direction. Decelerate and stop when the low-speed forward operation encounters the OFF→ON state of HSW, and use the stop position as the home position.

In this mode, operation in the negative direction is automatically reversed the first time the ON state of NL is encountered; when the ON state of PL is encountered, or when the ON state of NL is encountered again, the flow back to the origin is stopped and an alarm is sounded.

AsChart 9-45 shown, See Table 8. Introduction to 26 Return to Original Mode.

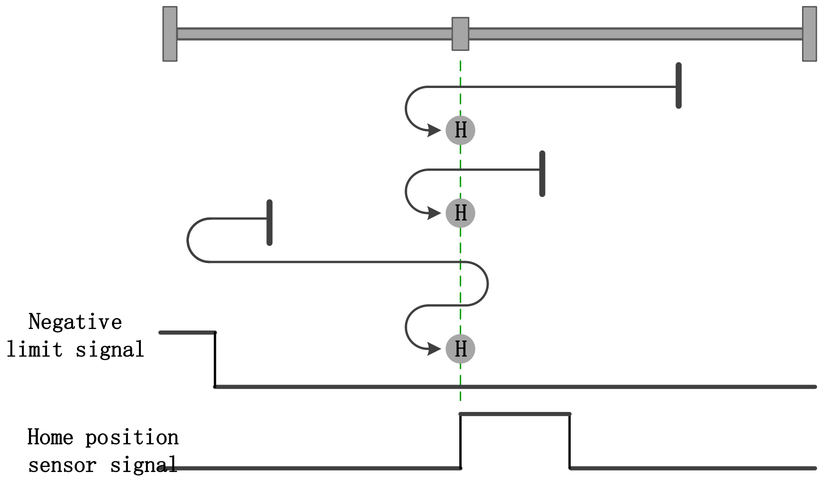


Chart 10-28 Origin mode 29 trajectory and signal state

Mode 30, Find the ON→OFF position of HSW when running in the negative direction, and automatically reverse when negative limit is encountered

If the HSW is invalid at the start and is on the positive side of the home position sensor, run at high speed in the negative direction, then slow down and stop after encountering the ON→OFF state of the HSW in the negative direction, then slow down and stop again after returning to the HSW valid position at high speed (if the HSW valid range is narrow, it may enter the HSW invalid range on the other side), then change to low speed and run in the negative direction. After that, change to low speed towards negative direction. Decelerate and stop when the low-speed negative operation meets the ON→OFF state of HSW, using the stop position as the home position.

If the HSW is invalid at the start and is on the negative side of the home position sensor, run at high speed in the negative direction, slow down and stop when it encounters the ON state of NL, and then run at high speed in the positive direction. When it encounters the OFF→ON state of HSW while running in the positive direction, decelerate and stop, and then change to low speed to run in the negative direction. Decelerate and stop when running in the negative direction at low speed and encounter the ON→OFF state of HSW, and use the stop position as the home position.

If the HSW is valid at the start, run at high speed in the negative direction. When running in the negative direction, decelerate and stop after encountering the ON→OFF state of HSW, then decelerate and stop again after retreating to the HSW valid position at high speed (if the HSW valid interval is narrow, it may enter the HSW invalid position interval on the other side), and then change to low speed to run in the negative direction. Decelerate and stop when low-speed negative operation encounters the ON→OFF state of HSW, using the stop position as the home position.

In this mode, operation in the negative direction is automatically reversed the first time the ON state of NL is encountered; when the ON state of PL is encountered, or when the ON state of NL is encountered again, the flow back to the origin is stopped and an alarm is sounded.

AsChart 9-46 shown, See Table 8. Introduction to 26 Return to Original Mode..

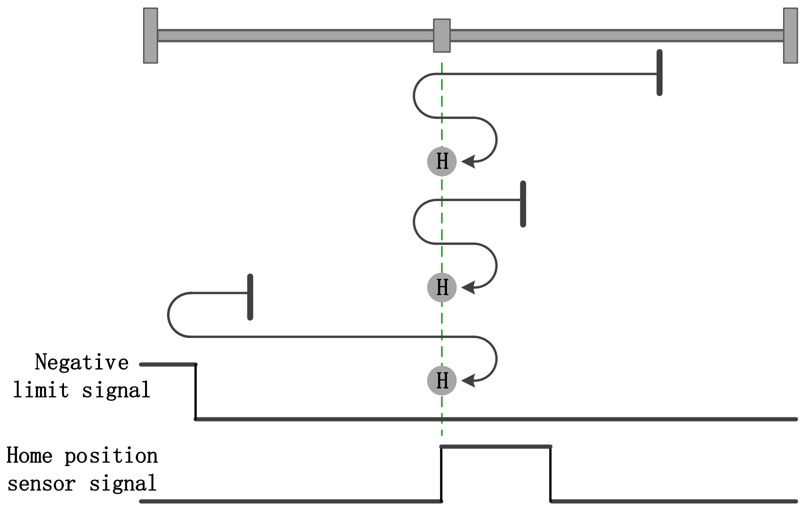


Chart 10-29 Origin mode 30 trajectory and signal state

Mode 31, Reserved, please do not set.

Mode 32, Reserved, please do not set.

Mode 33, Finding the nearest Z pulse during negative operation

Start at low speed towards negative direction to find the nearest Z pulse position as the home position. If running in the negative direction encounters the ON state of NL before finding the Z pulse, slow down and stop, then run in the positive direction to find the nearest Z pulse position as the home position.

In this mode, operation in the negative direction is automatically reversed the first time the ON state of NL is encountered; when the ON state of PL is encountered, or when the ON state of NL is encountered again, the flow back to the origin is stopped and an alarm is sounded.

AsChart 9-47 shown, See Table 8. Introduction to 26 Return to Original Mode.

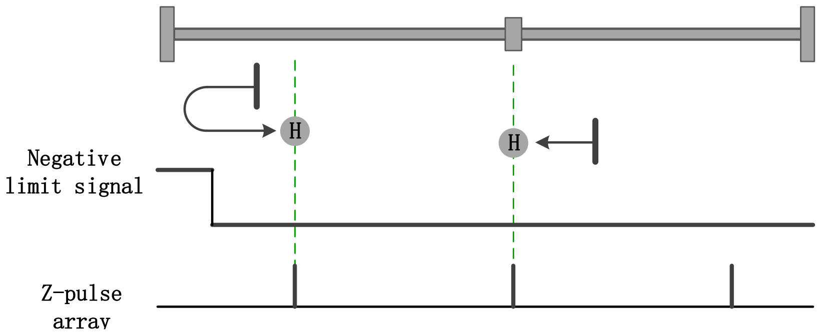


Chart 10-30 Origin mode 33 trajectory and signal state

Mode 34, Finding the nearest Z pulse during forward operation

Start with low speed towards positive direction to find the nearest Z pulse position as the home position. If running in the positive direction encounters the ON state of PL before finding the Z pulse, slow down and stop, then run in the negative direction to find the nearest Z pulse position as the home position.

In this mode, the first time the ON state of PL is encountered towards forward operation is automatically reversed; when the ON state of NL is encountered, or when the ON state of PL is encountered again, the flow back to the home position is stopped and an alarm is sounded.

AsChart9-48 shown, See Table 8. Introduction to 26 Return to Original Mode.

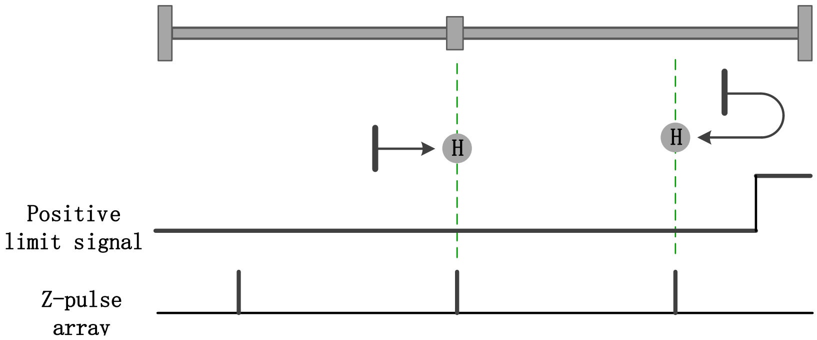
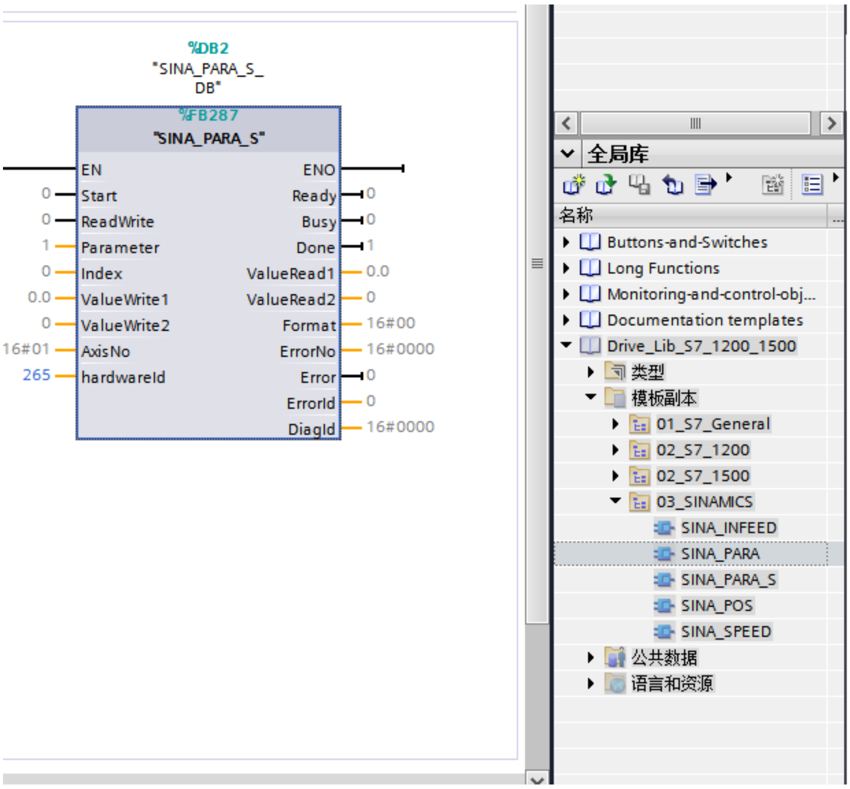


Chart 10-31 Origin mode 34 trajectory and signal state

10.5.4 Functional implementation of the SINA_PARA_S (FB287) function block

The S7-1500 and other PLCs implement the reading and writing of parameters to the YSK2-D through the control function block FB287. The specific function block locations are shown in the following figure.



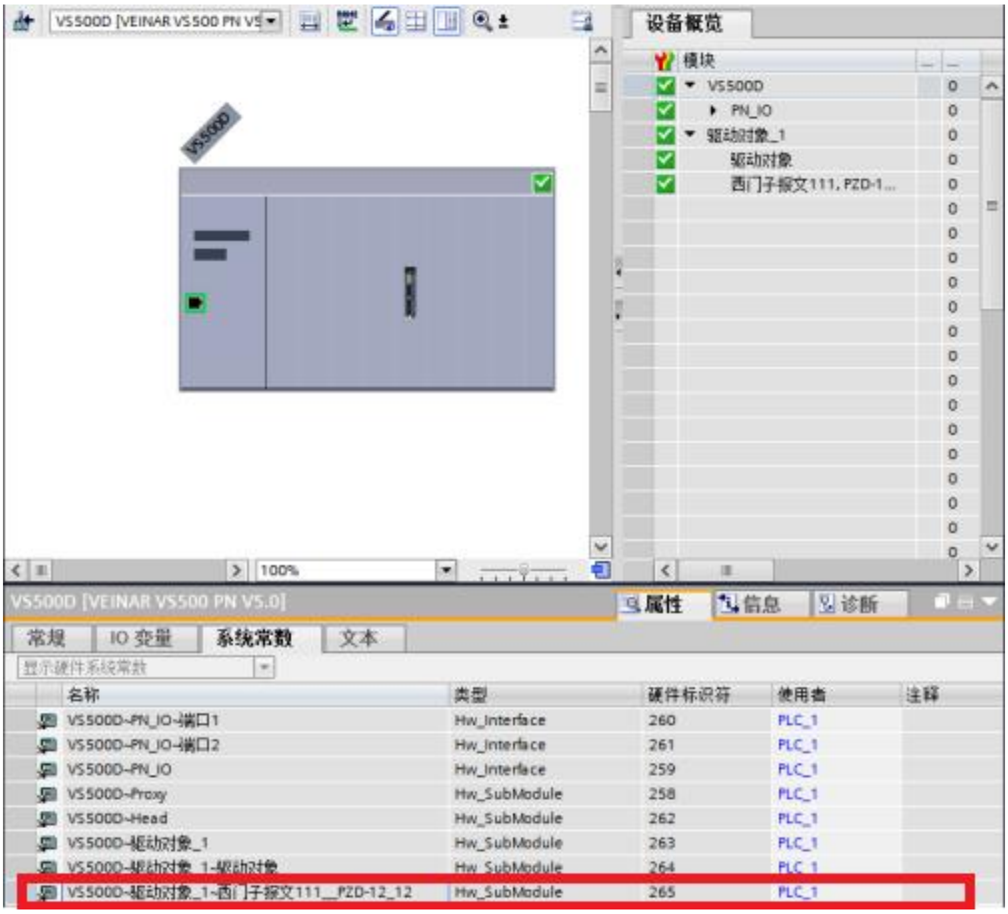
SINA_PARA_S(FB287) Function Block Pin Description

The FB287 function block pins are explained in the following table:

Pin	Data Type	Default Value	Description
Input			
Start	BOOL	0	Start job (0 = no job or job canceled; 1 = start and execute job)
ReadWrite	BOOL	0	Assignment Type 0 = read, 1 = write
Parameter	INT	1	Parameter number (see below for details on writing specific parameters)
Index	INT	0	Parameter Index
ValueWrite1	REAL	0.0	Parameter value (REAL format)
ValueWrite2	DINT	0	Parameter value (DINT format)
AxisNo	INT	1	Axis numbering in multi-axis systems

hardwareID	HW IO	1	Hardware ID of the actual value message slot of the module access point/axis or drive
Output			
Ready	BOOL	0	The block is not performing a read or write operation and is in the ready state
Busy	BOOL	0	1 when the task is being processed, 0 if completed or after failure
Done	BOOL	0	Change to 1 when task execution is completed
ValueRead1	REAL	0.0	Read the value of the parameter (REAL format)
ValueRead2	DINT	0	Read the value of the parameter (DINT format)
ErrorNo	INT	0	Error number for compliance with the PROFIdrive protocol
Error	BOOL	0	Activation group fault, "TURE" - with error; "FALSE" - normal execution
DiagId	INT	0	Error fault code

Before reading, you need to write the hardwareID (hardware identifier) in order to read and write parameters: in the drive configuration, select the drive object message that needs to be read, and find Hardware in the properties



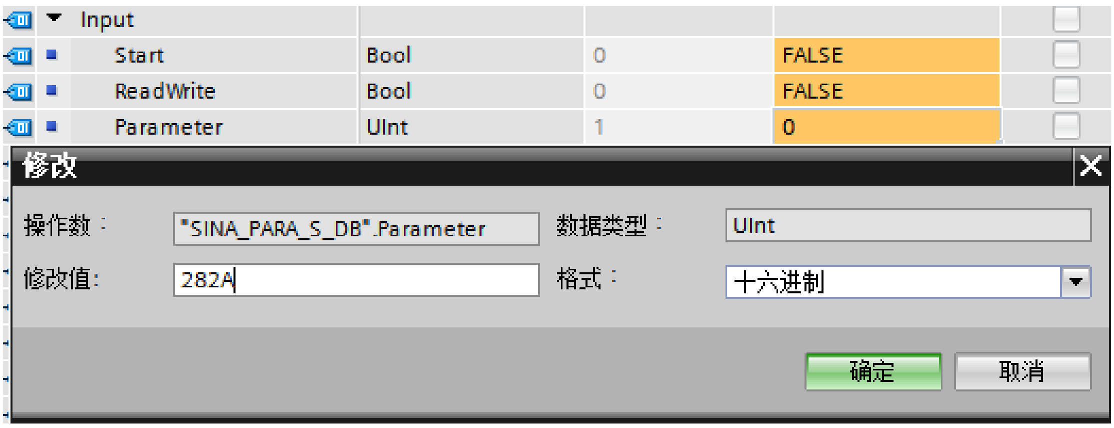
Just enter the hardware identifier in HardwareID.

When you need to read the parameters, you need to convert the servo local parameters to hexadecimal and then add 0x1000, to write the parameters, as shown below:

① F15.16 (JOG pointing 2): 15 converted to hexadecimal is 0x0F, 16 converted to hexadecimal is 0x10, the combination is 0x0F10, then in addition to 0x1000, the final 0x1F10, that is, 0x1F10 is the parameter number of F15.16.

② F24.42 (fault code): 24 converted to hexadecimal is 0x18, 42 converted to hexadecimal is 0x2A, the combination is 0x182A, then in addition to 0x1000, the final 0x282A, that is, 0x282A for the F24.42 parameter number.

Note: Servo local all single parameter, index needs to be 0, AxisNo fixed to 1



Select "Parameter", select "Hex" as the format, and then enter the "Modified Value". Change Start to "TURE" to read.

Chapter 11: Parameter

11.1 Parameter List

Parameter description: The parameters are divided into General parameters and Dedicated parameters

Some parameters only for dedicated model.

(1) General parameters: General parameters refer to the parameters that can be used in the YSK2 series

(2) Dedicated parameters: Dedicated parameters refer to parameters that can only be used by specific models in the YSK2 series.

However, there are also some special parameters among the general parameters, which are only used for specific models. Use the following annotations to distinguish.

A: Only for YSK2-A Parameter;

B: Only for YSK2-E Parameter;

D: Only for YSK2-D Parameter.

This manual will be marked after the specific functions in the detailed parameter introduction.

For example : F01.05 exists in general parameter , but its some function only for YSK2-A,so it was marked by "(A)".

F01.05	**Location command source**	**Setting range**	**factory value**	**unit**	**Mode of entry into force**	**Related models**		
		0 to 3	**0**	**--**	**Downtime in effect**	**P**	**S**	**T**

0:Pulse command(A)

1:Step amount given

2:Multi-segment position command

3:High-speed pulse command(A)

Related modes: P: Position mode; S: Speed mode; T: Torque mode.

A "●" in the list indicates that it is used in this mode, and a "-" indicates that it is not used in this mode.

Group number		Name	Related Models P	S	T
Group F00 Motor parameters	00	Automatic acquisition of motor parameters	●	●	●
	01	Motor type selection	●	●	●
	02	Motor model code (32 bits)	●	●	●
	04	Monitoring Options	●	●	●
	05	Component Versions	●	●	●
	10	Rated voltage	●	●	●
	11	Power Rating	●	●	●
	12	Rated current	●	●	●
	13	Rated torque	●	●	●
	14	Maximum torque	●	●	●
	15	Rated speed	●	●	●
	16	Maximum speed	●	●	●
	17	Rotational inertia Jm	●	●	●
	18	Number of motor pole pairs	●	●	●
	19	Stator resistance Rs	●	●	●
	20	d-axis inductance Ld	●	●	●

	21	q-axis inductance Lq	●	●	●
	22	Inverse potential coefficient (32 bits)	●	●	●
	24	Torque coefficient	●	●	●
	25	Initial position of absolute code disk (32 bits)	●	●	●
	27	Encoder selection	●	●	●
	29	Encoder resolution (32 bits)	●	●	●
	31	Z rising edge corresponding to electrical angle	●	●	●
	32	Weak magnetic option	●	●	●
	33	Motor code backup (32-bit)	●	●	●
	41	DDL motor pole pitch (N-N)	●	●	●
	42	DDL scale resolution	●	●	●
	43	DDL motor rated current	●	●	●
	44	DDL rated thrust	●	●	●
	45	DDL maximum thrust theoretical value	●	●	●
	46	DDL motor maximum speed	●	●	●
	48	DDL electric motor mass	●	●	●
	49	DDL stator line resistance	●	●	●
	50	DDL motor line inductor	●	●	●
	52	DDL inverse potential coefficient (32 bits)	●	●	●
	54	DDL/DDR motor Z electric angle	●	●	●
	59	DDL/DDR pole finding sign	●	●	●

Group F01 Basic parameters	00	Manufacturer Parameters	●	●	●
	01	Control mode selection	●	●	●
	02	Real-time self-adjusting mode	●	●	●
	03	Rigidity level setting	●	●	●
	04	Inertia ratio	●	●	●
	05	Location command source	●	●	●
	07	Pulse string pattern	●	-	-
	08	High-speed burst pattern	●	-	-
	09	Number of instructions required to rotate the motor one revolution (32 bits)	●	-	-
	11	Number of pulse lines output in one revolution of rotating motor (32 bits)	●	-	-
	13	Pulse output positive direction definition	●	●	●
	14	Pulse output OZ polarity	●	-	-
	15	Pulse output function selection	●	-	-
	16	Position Deviation Excess Threshold (32 bits)	●	●	●
	18	Braking resistor setting	●	●	●
	19	External resistor power capacity	●	●	●
	20	External resistor resistance value	●	●	●
	21	External resistor heating time constant	●	●	●
	22	Braking voltage point	●	●	●
	23	Position stepping amount setting	●	-	-
	30	Definition of positive direction of motor rotation	●	●	●

Group F02 Basic Gain Group	00	First position loop gain	●	-	-
	01	First speed loop gain	●	●	-
	02	First velocity loop integration time	●	●	-
	03	First speed detection filtering	●	●	●
	04	First torque command filtering	●	●	●
	05	Second position loop gain	●	-	-
	06	Second speed loop gain	●	●	-
	07	Second velocity loop integration time	●	●	-
	08	Second speed detection filtering	●	●	●
	09	Second torque command filtering	●	●	●
	10	Velocity loop PDFF factor	●	●	-
	11	Speed feedforward selection	●	-	-
	12	Speed feedforward gain	●	-	-
	13	Speed feed-forward filtering time	●	-	-
	14	Torque feedforward selection	●	●	-
	15	Torque feedforward gain	●	●	-
	16	Torque feed-forward filtering time	●	●	-
	17	DI function GAIN-SWITCH switching action selection	●	●	-
	18	Position control switching mode	●	●	-
	19	Position control switching delay	●	●	-
	20	Position control switching level	●	●	-
	21	Position control switching hysteresis	●	●	-
	22	Position gain switching time	●	●	-
	23	Speed control switching mode	-	●	-
	24	Speed control switching delay	-	●	-
	25	Speed control switching level	-	●	-
	26	Speed control switching back lag	-	●	-
	27	Torque control switching mode	-	-	●
	28	Torque control switching delay	-	-	●
	29	Torque control switching level	-	-	●
	30	Torque control switching hysteresis	-	-	●
	31	Observer Enable	●	●	●
	32	Observer cut-off frequency	●	●	●
	33	Observer phase compensation time	●	●	●
	34	Observer coefficient of inertia	●	●	●
	38	Current response trim factor	●	●	●
	40	Position command smoothing filtering	●	-	-
	41	Position command average filtering	●	-	-
	42	Position command average filtering 2	●	-	-

Group F03 Enhanced Performance Group	00	Adaptive filter mode	●	●	●
	01	Adaptive filtered load mode	●	●	●
	02	1st trap frequency (manual)	●	●	●
	03	1st trap width	●	●	●
	04	1st trap depth	●	●	●
	05	2nd trap frequency (manual)	●	●	●
	06	2nd trap width	●	●	●
	07	2nd trap depth	●	●	●
	08	3rd trap frequency	●	●	●
	09	3rd trap width	●	●	●
	10	3rd trap depth	●	●	●
	11	4th trap frequency	●	●	●
	12	4th trap width	●	●	●
	13	4th trap depth	●	●	●
	17	Post Torque Filter	●	●	●
	20	1st damping frequency (low frequency vibration control)	●	●	-
	21	1st damping filter setting	●	●	-
	22	The 2nd damping frequency (low frequency vibration control)	●	●	-
	23	2nd damping filter setting	●	●	-
	29	Resonance point 1 frequency	●	●	●
	30	Resonance point 1 frequency width	●	●	●
	31	Resonance point 1 amplitude	●	●	●
	32	Resonance point 2 frequency	●	●	●
	33	Resonance point 2 frequency width	●	●	●
	34	Resonance point 2 amplitude	●	●	●
	35	Gravity load compensation value	●	●	-
	36	Load compensation storage options	●	●	-
	37	Positive friction torque compensation	●	●	-
	38	Reverse friction torque compensation	●	●	-
	39	Viscous friction compensation	●	●	-
	41	Friction compensation time constant	●	●	-
	42	Friction compensation low speed range	●	●	-
	44	Parameter recognition speed value	●	●	-
	45	Parameter recognition acceleration time	●	●	-
	46	Parameter identification deceleration time	●	●	-
	47	Parameter recognition mode	●	●	-
	48	Angle discrimination and pole-seeking currents	●	●	●
	49	Magnetic pole phase finding method	●	●	●
	50	Micro-action phase seeking action threshold	●	●	●
	51	Micro-motion phase-seeking stationary threshold	●	●	●
	52	Direct positioning of phase angle	●	●	●
	54	Closed-loop pre-positioning phase finding fast and slow	●	●	●
	55	Phase-seeking movable range	●	●	●
	56	Magnetic pole phase seeking line sequence identification switch	●	●	●
	57	Allowable range of phase finding error	●	●	●
	58	Finding the threshold of the opposite direction flying car decision	●	●	●
	59	Overspeed determination threshold in phase search	●	●	●
	60	Hall U1V0W1 corresponds to the electrical angle	●	●	●
	61	Hall U1V0W0 corresponds to the	●	●	●

		electrical angle			
	62	Hall U1V1W0 corresponds to the electrical angle	●	●	●
	63	Hall U0V1W0 corresponds to the electrical angle	●	●	●
	64	Hall U0V1W1 corresponds to the electrical angle	●	●	●
	65	Hall U0V0W1 corresponds to the electrical angle	●	●	●
	66	Mode 3 phase seeking current amplitude	●	●	●
	69	Model Tracking Options	●	-	-
	70	Model tracking gain	●	-	-
	71	Model tracking compensation factor	●	-	-
	72	Model tracking speed compensation gain	●	-	-
	73	Model tracking torque compensation gain 1	●	-	-
	74	Model tracking torque compensation gain 2	●	-	-
	75	Model anti-resonance frequency	●	-	-
	76	Model residual vibration frequency	●	-	-
	77	Model delay bandwidth parameters	●	-	-
	78	Model delay compensation parameters	●	-	-
	81	Second model tracking gain	●	-	-
	82	Second model tracking compensation factor	●	-	-
	83	Is the model vibration effective	-	-	-
	84	Vibration suppression frequency point	●	-	-
	85	Vibration suppression compensation factor	●	-	-

Group F04 Position Control	00	First electron gear molecule (32 bits)	●	-	-
	02	Electronic gear denominator (32 bits)	●	-	-
	04	Second electron gear molecule (32 bits)	●	-	-
	06	Pulse output frequency division ratio numerator (32 bits)	●	-	-
	08	Pulse output divider than denominator (32 bits)	●	-	-
	10	Position deviation clearance function	●	-	-
	11	Deviation clear input setting	●	-	-
	12	Pulse disable input setting	●	-	-
	13	Electronic gear ratio switching delay setting	●	-	-
	31	Position comparison output mode	●	-	-
	32	Position 1 (32 bits)	●	-	-
	34	Position 2 (32 bits)	●	-	-
	36	Position 3 (32 bits)	●	-	-
	38	Position 4 (32 bits)	●	-	-
	40	Signal validity time1	●	-	-
	41	Signal validity time2	●	-	-
	42	Signal validity time3	●	-	-
	43	Signal validity time4	●	-	-
	44	Display delay	●	-	-
	46	Multi-segment position execution method	●	-	-
	47	Multi-segment position command type	●	-	-
	48	Multi-segment position internal control of waiting time	●	-	-
	49	Multi-segment position starting segment serial number	●	-	-
	50	Multi-segment position end segment serial number	●	-	-
	51	Multi-segment position pause and restart remaining segment processing	●	-	-
	52	Interrupt length execution setting	●	-	-
	53	Interrupting long electronic gear selection	●	-	-
	54	Interrupt positioning instruction direction selection	●	-	-
	55	Interrupt length setting	●	-	-
	56	Clear deviation setting when pulse is disabled	●	●	●
	57	Pause selection during contour position control	●	●	●
	58	Contour position pause resume selection	●	●	●
	59	Motor one circle maximum equal fraction	●	-	-
	60	Non-absolute system position feedback initialization selection	●	●	●
	61	Positioning completion range	●	-	-
	62	Positioning completion output setting	●	-	-
	63	Positioning completion hold time	●	-	-
	64	Positioning proximity range	●	-	-
	65	Interrupt positioning completion hold time	●	-	-
	66	Interrupt positioning displacement amount (32 bits)	●	-	-
	68	Interrupt positioning maximum speed	●	-	-
	70	Interrupted positioning acceleration time	●	-	-
	71	Interrupt positioning deceleration time	●	-	-

Group F05 Speed-torque control	00	Speed command source	-	●	-
	01	Speed command setting value	-	●	-
	02	Tap speed setting value	-	●	-
	06	Torque limiting source	●	●	-
	07	Internal torque limiting in forward rotation	●	●	-
	08	Reverse internal torque limiting	●	●	-
	09	External torque limiting on the forward side	●	●	-
	10	External torque limiting on the reverse side	●	●	-
	12	Acceleration time 1	-	●	●
	13	Deceleration time1	-	●	●
	14	Acceleration time 2	-	●	●
	15	Deceleration time2	-	●	●
	16	Acceleration time 3	-	●	●
	17	Deceleration time3	-	●	●
	18	Acceleration time 4	-	●	●
	19	Deceleration time4	-	●	●
	21	Zero speed clamp function	-	●	●
	22	Zero Speed Clamp Threshold	-	●	●
	23	Fast deceleration time	●	●	●
	24	Torque command source	-	-	●
	27	Torque command keypad setpoint	-	-	●
	28	Speed limit source selection for torque control	-	-	●
	29	Internal positive speed limit	-	-	●
	30	Internal negative speed limit	-	-	●
	31	Hard limit torque limiting	●	●	●
	32	Hard limit torque limit detection time	●	●	●
	33	Speed command serial number selection method	-	●	-
	34	Paragraph 1 speed	-	●	-
	35	Paragraph 1 acceleration and deceleration options	-	●	-
	36	Paragraph 2 speed	-	●	-
	37	Paragraph 2 acceleration and deceleration options	-	●	-
	38	Paragraph 3 speed	-	●	-
	39	Paragraph 3 acceleration and deceleration options	-	●	-
	40	Paragraph 4 speed	-	●	-
	41	Paragraph 4 acceleration and deceleration options	-	●	-
	42	Paragraph 5 speed	-	●	-
	43	Paragraph 5 acceleration and deceleration options	-	●	-
	44	Paragraph 6 speed	-	●	-
	45	Paragraph 6 acceleration and deceleration options	-	●	-
	46	Paragraph 7 speed	-	●	-
	47	Paragraph 7 acceleration and deceleration options	-	●	-
	48	Paragraph 8 speed	-	●	-
	49	Paragraph 8 acceleration and deceleration options	-	●	-
	50	Paragraph 9 speed	-	●	-
	51	Paragraph 9 acceleration and deceleration options	-	●	-
	52	Paragraph 10 speed	-	●	-
	53	Paragraph 10 acceleration and deceleration options	-	●	-
	54	Paragraph 11 speed	-	●	-
	55	Paragraph 11 acceleration and deceleration options	-	●	-
	56	Paragraph 12 speed	-	●	-
	57	Paragraph 12 acceleration and deceleration options	-	●	-
	58	Paragraph 13 speed	-	●	-
	59	Paragraph 13 acceleration and deceleration options	-	●	-
	60	Paragraph 14 speed	-	●	-
	61	Paragraph 14 acceleration and deceleration options	-	●	-
	62	Paragraph 15 speed	-	●	-
	63	Paragraph 15 acceleration and deceleration options	-	●	-
	64	Paragraph 16 speed	-	●	-
	65	Paragraph 16 acceleration and deceleration options	-	●	-
	70	Speed consistent signal width	-	●	-
	71	Speed reaches specified value	●	●	●
	73	Motor rotation signal speed threshold	●	●	●
	74	Zero Speed Signal Output Threshold	●	●	●
	75	Torque reaches specified value	●	●	●
	76	Torque arrival detection width	●	●	●

Group F06 Dig	00	Number of active DI terminals	●	●	●
	01	DI1 terminal function selection	●	●	●

ital Inputs and Outputs	02	DI2 terminal function selection	●	●	●
	03	DI3 terminal function selection	●	●	●
	04	DI4 terminal function selection	●	●	●
	05	DI5 terminal function selection	●	●	●
	11	DI1 terminal logic selection	●	●	●
	12	DI2 terminal logic selection	●	●	●
	13	DI3 terminal logic selection	●	●	●
	14	DI4 terminal logic selection	●	●	●
	15	DI5 terminal logic selection	●	●	●
	20	Number of effective DO terminals	●	●	●
	21	DO1 terminal function selection	●	●	●
	22	DO2 terminal function selection	●	●	●
	26	DO6 terminal function selection	●	●	●
	31	DO1 terminal logic level selection	●	●	●
	32	DO2 terminal logic level selection	●	●	●
	41	FunIN1 signal unassigned state (HEX) DI1-DI15	●	●	●
	42	FunIN2 signal unassigned status (HEX) DI16-DI31	●	●	●
	43	FunIN3 signal unassigned status (HEX) DI32-DI47	●	●	●
	44	FunIN4 signal unassigned status (HEX) DI48-DI63	●	●	●
	53	Servo OFF delay time after brake action at zero speed	●	●	●
	54	Speed setting for brake operation in operation	●	●	●
	55	Waiting time for brake action in operation	●	●	●
	56	Dynamic Braking (DB) function selection	●	●	●
	59	Z pulse width adjustment	●	●	●
	61	General DI filtering options	●	●	●
	62	High-speed DI filtering setting	●	●	●

Group F07 Analog Inputs and Outputs	00	AI1 minimum input	●	●	●
	01	AI1 minimum value corresponds to the set value	●	●	●
	02	AI1 maximum input	●	●	●
	03	AI1 maximum value corresponds to the set value	●	●	●
	04	AI1 zero point trim	●	●	●
	05	AI1 deadband setting	●	●	●
	06	AI1 input filtering time	●	●	●
	07	AI1 function selection	●	●	●
	10	AI2 minimum input	●	●	●
	11	AI2 minimum value corresponds to the set value	●	●	●
	12	AI2 maximum input	●	●	●
	13	AI2 maximum value corresponds to the set value	●	●	●
	14	AI2 zero point trim	●	●	●
	15	AI2 deadband setting	●	●	●
	16	AI2 input filtering time	●	●	●
	17	AI2 function selection	●	●	●
	20	AI set 100% speed	●	●	●
	21	AI set 100% torque	●	●	●
	30	AO1 signal selection (non-standard support)	●	●	●
	31	AO1 bias amount voltage	●	●	●
	32	AO1 multiplier	●	●	●
	33	AO1 output data setting	●	●	●
	34	AO2 signal selection (non-standard support)	●	●	●
	35	AO2 bias amount voltage	●	●	●
	36	AO2 multiplier	●	●	●
	37	AO2 output data setting	●	●	●

Group F08 Fault Protection Group	00	Instant stop non-stop protection switch	●	●	●
	01	Instant stop non-stop deceleration time	●	●	●
	02	Servo OFF stop method	●	●	●
	03	No.2 Fault stop mode selection	●	●	●
	04	Overtravel input setting	●	●	●
	05	Stopping method in case of overtravel	●	●	●
	06	Power input phase loss protection selection	●	●	●
	07	Power output out-of-phase protection options	●	●	●
	08	Emergency stop torque	●	●	●
	09	Flying car protection function	●	●	●
	10	Overload warning value	●	●	●
	11	Motor overload protection factor	●	●	●
	12	Undervoltage protection point	●	●	●
	13	Overspeed fault point	●	●	●
	14	Maximum pulse input frequency	●	-	-
	15	Short circuit to ground detection protection options	●	●	●
	16	Bus-type encoder interference detection delay	●	●	●
	17	Pulse input filter setting	●	-	-
	18	High-speed pulse input filtering	●	●	●
	22	Excessive speed deviation threshold	●	●	-
	23	Torque saturation timeout duration	●	●	●
	24	Absolute system setting	●	●	●
	26	Stopping method for emergency stop (quick stop)	-	-	-
	27	Stopping method of pause	-	-	-
	28	Software Overcurrent Options	●	●	●
	29	Not ready to handle when servo enabled	●	●	●
	30	Mains power failure (E.46) detection setting	●	●	●
	31	Undervoltage (E.23) detection option	●	●	●
	32	Undervoltage (E.23) and mains power failure (E.46) storage options	●	●	●
	34	Soft limit detection setting	●	●	●
	35	Positive soft limit (32 bits)	●	●	●
	37	Negative soft limit (32 bits)	●	●	●
	39	Fault reset timing	●	●	●
	40	Power failure prompt storage function	●	●	●
	41	Abnormality detection switch	●	●	●

Group F09 Communication setting	00	Servo axis address number	●	●	●
	01	Modbus baud rate	●	●	●
	02	Modbus data format	●	●	●
	03	Communication timeout	●	●	●
	04	Communication response time delay	●	●	●
	05	Communication control DI enable setting 1	●	●	●
	06	Communication control DI enable setting 2	●	●	●
	07	Communication control DI enable setting 3	●	●	●
	08	Communication control DI enable setting 4	●	●	●
	09	Communication control DO enable setting 1	●	●	●
	10	Communication control DO enable setting 2	●	●	●
	11	Communication setting command value maintenance time	●	●	●
	12	CAN communication baud rate:	●	●	●
	13	Electronic gear ratio selection during communication control	●	●	●
	14	Speed command unit selection during communication control	●	●	●
	15	Acceleration unit selection during communication control	●	●	●
	16	Bus communication fault detection options	●	●	●
	17	Absolute system origin completion flag storage selection	●	●	●
	18	EtherCAT Servo Site Number	●	●	●
	19	Bus communication synchronous phase fine-tuning	●	●	●
	20	Number of synchronous message loss or disconnection detection	●	●	●
	21	EtherCAT Speed Limit Selection	●	●	●

Group F10 Multi-segment position	00	1st segment displacement (32 bits)	●	-	-
	02	Segment 1 maximum speed (32 bits)	●	-	-
	04	Paragraph 1 acceleration multiplier	●	-	-
	05	Paragraph 1 deceleration multiplier	●	-	-
	06	Segment 2 displacement (32 bits)	●	-	-
	08	Segment 2 maximum speed (32 bits)	●	-	-
	10	Paragraph 2 acceleration multiplier	●	-	-
	11	Paragraph 2 deceleration multiplier	●	-	-
	12	Segment 3 displacement (32 bits)	●	-	-
	14	Paragraph 3 maximum speed (32 bits)	●	-	-
	16	Paragraph 3 acceleration multiplier	●	-	-
	17	Paragraph 3 deceleration multiplier	●	-	-
	18	Segment 4 displacement (32 bits)	●	-	-
	20	Paragraph 4 maximum speed (32 bits)	●	-	-
	22	Paragraph 4 acceleration multiplier	●	-	-
	23	Paragraph 4 deceleration multiplier	●	-	-

	24	Paragraph 5 displacement (32 bits)	●	-	-
	26	Paragraph 5 maximum speed (32 bits)	●	-	-
	28	Paragraph 5 acceleration multiplier	●	-	-
	29	Paragraph 5 deceleration multiplier	●	-	-
	30	Paragraph 6 displacement (32 bits)	●	-	-
	32	Paragraph 6 maximum speed (32 bits)	●	-	-
	34	Paragraph 6 acceleration multiplier	●	-	-
	35	Paragraph 6 deceleration multiplier	●	-	-
	36	Paragraph 7 displacement (32 bits)	●	-	-
	38	Paragraph 7 maximum speed (32 bits)	●	-	-
	40	Paragraph 7 acceleration multiplier	●	-	-
	41	Paragraph 7 deceleration multiplier	●	-	-
	42	Paragraph 8 displacement (32 bits)	●	-	-
	44	Paragraph 8 maximum speed (32 bits)	●	-	-
	46	Paragraph 8 acceleration multiplier	●	-	-
	47	Paragraph 8 deceleration multiplier	●	-	-
	48	Paragraph 9 displacement (32 bits)	●	-	-
	50	Paragraph 9 maximum speed (32 bits)	●	-	-
	52	Paragraph 9 acceleration multiplier	●	-	-
	53	Paragraph 9 deceleration multiplier	●	-	-
	54	Paragraph 10 displacement (32 bits)	●	-	-
	56	Paragraph 10 maximum speed (32 bits)	●	-	-
	58	Paragraph 10 acceleration multiplier	●	-	-
	59	Paragraph 10 deceleration multiplier	●	-	-
	60	Paragraph 11 displacement (32 bits)	●	-	-
	62	Paragraph 11 maximum speed (32 bits)	●	-	-
	64	Paragraph 11 acceleration multiplier	●	-	-
	65	Paragraph 11 deceleration multiplier	●	-	-
	66	Segment 12 displacement (32 bits)	●	-	-
	68	Paragraph 12 maximum speed (32 bits)	●	-	-
	70	Paragraph 12 acceleration multiplier	●	-	-
	71	Paragraph 12 deceleration multiplier	●	-	-
	72	Paragraph 13 displacement (32 bits)	●	-	-
	74	Paragraph 13 maximum speed (32 bits)	●	-	-
	76	Paragraph 13 acceleration multiplier	●	-	-
	77	Paragraph 13 deceleration multiplier	●	-	-
	78	Paragraph 14 displacement (32 bits)	●	-	-
	80	Paragraph 14 maximum speed (32 bits)	●	-	-
	82	Paragraph 14 acceleration multiplier	●	-	-
	83	Paragraph 14 deceleration multiplier	●	-	-
	84	Paragraph 15 displacement (32 bits)	●	-	-
	86	Paragraph 15 maximum	●	-	-

		speed (32 bits)			
	88	Paragraph 15 acceleration multiplier	●	-	-
	89	Paragraph 15 deceleration multiplier	●	-	-
	90	Paragraph 16 displacement (32 bits)	●	-	-
	92	Paragraph 16 maximum speed (32 bits)	●	-	-
	94	Paragraph 16 acceleration multiplier	●	-	-
	95	Paragraph 16 deceleration multiplier	●	-	-

Group F11 Origin regression, full closed loop	00	Origin return start method	●	-	-
	01	Origin return mode	●	-	-
	02	Home return time limit and Z signal setting	●	-	-
	04	High-speed search speed of the origin	●	-	-
	05	Speed of low-speed search origin	●	-	-
	06	Acceleration and deceleration time when searching for the origin	●	-	-
	07	Time limit value of the return home process	●	-	-
	08	Origin coordinate offset (32 bits)	●	-	-
	10	Mechanical home position offset (32 bits)	●	-	-
	12	DI initiates an effective way of origin return	●	-	-
	13	Limit detection method when searching for the home position	●	●	●
	20	Second encoder usage	●	-	-
	22	External encoder pitch (32 bits)	●	-	-
	24	Fully closed-loop mixing deviation oversize threshold (32 bits)	●	-	-
	26	Mixing deviation count setting	●	-	-
	27	Hybrid vibration suppression gain	●	-	-
	28	Hybrid vibration suppression time constant	●	-	-
	30	Fully closed-loop mixed deviation external units (32 bits)	●	-	-
	32	External units for internal encoder count values (32 bits)	●	-	-
	34	External encoder count value (32 bits)	●	-	-

Group F12 Operator Panel Settings	00	Panel default display selection	●	●	●
	01	Panel monitoring parameter setting 1	●	●	●
	02	Panel monitoring parameter setting 2	●	●	●
	03	Panel monitoring parameter setting 3	●	●	●
	04	Panel monitoring parameter setting 4	●	●	●
	05	Panel monitoring parameter setting 5	●	●	●
	06	Time multiplier for search origin	●	●	●
	07	User Password	●	●	●
	08	User encrypted lock screen time	●	●	●
	12	Bit width selection for position feedback displays (F24.13 and F24.15), the	●	●	●
	13	DIDO monitoring in	●	●	●

		binary display or hexadecimal display			
	14	Manufacturer Parameters	●	●	●

Group F14 PN communication parameters	00	Physical NIC address1	●	●	●
	01	Physical NIC address 2	●	●	●
	02	Physical NIC address3	●	●	●
	04	The 1st and 2nd characters of the device name	●	●	●
	05	The 3rd and 4th characters of the device name	●	●	●
	06	The 5th and 6th characters of the device name	●	●	●
	07	The seventh and eighth characters of the device name	●	●	●
	08	Equipment IPA	●	●	●
	09	Equipment IPB	●	●	●
	10	Device Network Mask A	●	●	●
	11	Device Network Mask B	●	●	●
	12	Network Manager A	●	●	●
	13	Network Manager B	●	●	●
	14	Data write switch	●	●	●
	15	922 message monitoring	●	●	●
	16	Additional message monitoring	●	●	●
	17	925 Heartbeat Alarm Threshold	●	●	●
	18	944 Fault message counter	●	●	●
	19	947 fault number	●	●	●
	20	Fault serial number	●	●	●
	21	952 Fault status counter	●	●	●
	22	979_0 Sensor head (32 bits)	●	●	●
	24	979_1 Sensor type (32 bits)	●	●	●
	26	979_2 Sensor resolution (32 bits)	●	●	●
	28	979_3 Sensor G1_XIST1 factor (32 bits)	●	●	●
	30	979_4 sensor G1_XIST2 factor (32 bits)	●	●	●
	32	979_5 sensor multi-turn (32 bits)	●	●	●
	34	Synchronization cycle	●	●	●
	35	FPGA synchronization detection threshold	●	●	●
	36	Speed ramp on flag 1=not on 0=on	-	●	-
	37	Update Now Switch	●	-	-
	40	Disengage To control servo local acceleration time (32 bits)	-	●	-
	42	Disengage To control servo local deceleration time (32 bits)	-	●	-
	44	Deceleration time in speed mode (acceleration time in units of 0-1000RPM: ms)(32 bits)	-	●	-
	46	bit10 Hysteresis judgment value (RPM)	-	●	-
	47	N4 speed error range (RPM)	●	●	●
	48	Speed error range time (ms)	●	●	●
	49	ARM and 200P dropout detection function control switch	●	●	●
	50	Whether the synchronization period is a current loop multiplier detection switch	●	●	●
	51	Test variables test IRT	●	●	●

		mode			

Group F15 PN basic positioner settings	00	Maximum speed (32 bits)	●	-	-
	02	Maximum acceleration (32 bits)	●	-	-
	04	Maximum deceleration (32 bits)	●	-	-
	06	Maximum ramp speed (32 bits)	●	-	-
	08	Position Deviation Excess Threshold (32 bits)	●	-	-
	10	Position reach threshold (32 bits)	●	-	-
	12	Location arrival window (32 bits)	●	-	-
	14	JOG Speed 1 (32-bit)	●	●	-
	16	JOG Speed 2 (32-bit)	●	●	-
	18	JOG maximum acceleration (32 bits)	●	●	-
	20	JOG maximum deceleration (32 bits)	●	●	-
	22	Origin regression type	●	-	-
	23	Origin return high-speed speed (32-bit)	●	-	-
	25	Home return low speed (32 bit)	●	-	-
	27	Home return acceleration and deceleration time (32 bits)	●	-	-
	29	Home Return Relative Offset (32 bits)	●	-	-
	31	Absolute offset of origin regression (32 bits)	●	-	-
	33	Reference coordinate value (32 bits)	●	-	-
	35	Home return timeout (32 bits)	●	-	-
	37	Soft limit effective method	●	-	-
	38	Soft limit positive limit value (32 bits)	●	-	-
	40	Soft limit negative limit value (32 bits)	●	-	-
	42	Electronic gear ratio molecule (32 bits)	●	-	-
	44	Electronic gear score denominator (32 bits)	●	-	-
	46	s111 message send content	●	-	-
	47	s111 message upload content	●	-	-
	48	Low upper limit of modal axis pulse (32 bits)	●	-	-
	50	Upper limit of modal axis pulse height (32 bits)	●	-	-
	52	Modal axis on switch	●	-	-
	53	Non-cyclic data saving switch	●	-	-
	54	Mobile Signal Output Threshold	●	-	-
	55	Motor 1 turn corresponds to the number of LU (32 bits)	●	-	-

Group F16 PN commissioning parameters	00	Receiving word PZD1	●	●	●
	01	Receiving word PZD2	●	●	●
	02	Receiving word PZD3	●	●	●
	03	Receiving word PZD4	●	●	●
	04	Receiving word PZD5	●	●	●
	05	Receiving word PZD6	●	●	●
	06	Receiving word PZD7	●	●	●
	07	Receiving word PZD8	●	●	●
	08	Receiving word PZD9	●	●	●
	09	Receiving word PZD10	●	●	●
	10	Receiving word PZD11	●	●	●
	11	Receiving word PZD12	●	●	●
	16	Send word PZD1	●	●	●
	17	Send word PZD2	●	●	●
	18	Send word PZD3	●	●	●
	19	Send word PZD4	●	●	●
	20	Send word PZD5	●	●	●
	21	Send word PZD6	●	●	●
	22	Send word PZD7	●	●	●
	23	Send word PZD8	●	●	●
	24	Send word PZD9	●	●	●
	25	Send word PZD10	●	●	●
	26	Send word PZD11	●	●	●
	27	Send word PZD12	●	●	●

Group F23 Auxiliary functions	00	Keyboard JOG trial run	●	●	●
	01	Fault Reset	●	●	●
	03	Parameter recognition function	●	●	●
	05	Automatic calibration of analog inputs	●	●	●
	06	System initialization functions	●	●	●
	08	Communication operation command input	●	●	●
	09	Communication operation status output	●	●	●
	10	Inertia recognition value	●	●	●
	11	Communication selection multi-segment command sequence number	●	●	-
	12	Communication start origin return	●	-	-
	13	Linear motor initial communication electrical angle identification	●	●	●

Group F24 Display parameters	00	Servo Status	●	●	●
	01	Motor speed feedback	●	●	●
	03	Motor speed command	●	●	●
	04	Internal torque command	●	●	●
	05	Phase Current RMS	●	●	●
	06	Bus voltage	●	●	●
	07	Inertia discrimination value	●	●	●
	08	Input position command corresponds to speed	●	●	●
	09	Electric angle	●	●	●
	10	Mechanical angle	●	●	●
	11	Input instruction counter (32 bits)	●	●	●
	13	Feedback position pulse unit (32 bits)	●	●	●
	15	Feedback position command unit (32 bits)	●	●	●
	17	Position deviation pulse unit (32 bits)	●	●	●
	19	Position deviation order unit (32 bits)	●	●	●
	21	Digital input signal monitoring	●	●	●
	23	Digital output signal monitoring	●	●	●
	24	Encoder Status	●	●	●
	25	Total power-up time (32 bits)	●	●	●
	27	AI1 voltage correction value	●	●	●
	28	AI2 voltage correction value	●	●	●
	29	AI1 voltage raw value	●	●	●
	30	AI2 voltage raw value	●	●	●
	31	Module temperature value	●	●	●
	32	Number of absolute position encoder turns (32 bits)	●	●	●
	34	Absolute position encoder single-turn position (32 bits)	●	●	●
	36	Load factor	●	●	●
	37	Regenerative load factor	●	●	●
	38	Version number 1	●	●	●
	39	Version number 2	●	●	●
	40	Version number 3	●	●	●
	41	Display of fault records	●	●	●
	42	Fault Code	●	●	●
	43	Fault timestamp (32-bit)	●	●	●
	45	Current speed at failure	●	●	●
	46	Instantaneous current at fault	●	●	●
	47	Busbar voltage at fault	●	●	●
	48	Input terminal status at fault	●	●	●
	49	Output terminal status at fault	●	●	●
	50	Product Series Code	●	●	●
	52	Internal warning codes	●	●	●
	53	Internal instruction current segment number	●	●	●
	54	Custom Edition Series No.	●	●	●
	55	Absolute position counter high 32 bits (32 bits)	●	●	●
	57	Feedback pulse counter high 32 bits (32 bits)	●	●	●
	60	Analog mode feedback count display (32-bit)	●	●	●
	62	Protocol Stack Version	●	●	●
	63	Profidrive version number	●	●	●
	64	Network status display	●	●	●
	65	MAC address display 1	●	●	●
	66	MAC address display2	●	●	●
	67	MAC address display3	●	●	●
	68	MAC address display4	●	●	●

11.2 Genernal Parameters

Group F00 Motor parameters

F00.00	Automatic acquisition of motor parameters	Setting range	factory value	unit	Mode of entry into force	Related models		
		0 to 3	0	--	Power up again.	P	S	T

0:Manual, manually set the motor parameters model and parameters
1:Automatic, all parameters from motor memory
2:Automatic, all get motor parameters from motor memory

F00.01	Motor type selection	Setting range	factory value	unit	Mode of entry into force	Related models		
		0 ~ 1	0	--	Power up again.	P	S	T

0:Rotary motor
1:Linear motor

F00.02	Motor model code (32 digits)	Setting range	factory value	unit	Mode of entry into force	Related models		
		0 to 2147483647	65535	--	Power up again.	P	S	T

0 to 2147483647

F00.04	Monitoring Options	Setting range	factory value	unit	Mode of entry into	Related models

					force			
		0 to 63	0	--	Downtime in effect	P	S	T

F00.05	Component Versions	Setting range	factory value	unit	Mode of entry into force	Related models		
		0 ~ 65535	0	--	Downtime in effect	P	S	T

F00.06	Motor memory code (32 bits)	Setting range	factory value	unit	Mode of entry into force	Related models		
		0 to 2147483647	0	--	Power up again.	P	S	T

F00.10	Rated voltage	Setting range	factory value	unit	Mode of entry into force	Related models		
		1 to 1000	220	--	Power up again.	P	S	T

1 to 1000V

F00.11	rating	Setting range	factory value	unit	Mode of entry into force	Related models		
		1 to 65535	75	0.01	Power up again.	P	S	T

0.01KW ~ 655.35KW

F00.12	Rated current	Setting range	factory value	unit	Mode of entry into force	Related models		
		1 to 10,000	430	0.01A	Power up again.	P	S	T

0.01A ~ 100.00A

F00.13	Rated torque	Setting range	factory value	unit	Mode of entry into force	Related models		
		10 to 65535	240	0.01Nm	Power up again.	P	S	T

0.10Nm ~ 655.35Nm

F00.14	Maximum torque	Setting range	factory value	unit	Mode of entry into force	Related models		
		10 to 65535	720	0.01Nm	Power up again.	P	S	T

0.10Nm ~ 655.35Nm

F00.15	Rated speed	Setting range	factory value	unit	Mode of entry into force	Related models		
		1 to 9000	3000	1rpm	Power up again.	P	S	T

1rpm to 9000rpm

F00.16	Maximum speed	Setting range	factory value	unit	Mode of entry into force	Related models		
		1 to 9000	5000	1rpm	Power up again.	P	S	T

1rpm to 9000rpm

F00.17	Rotational inertia Jm	Setting range	factory value	unit	Mode of entry into force	Related models		
		1 to 10,000	130	0.01 ㎏ c ㎡	Power up again.	P	S	T

0.01kgc ㎡ ~ 100.00kgc ㎡

F00.18	Number of motor pole pairs	Setting range	factory value	unit	Mode of entry into force	Related models		
		1 to 50	4	1 pair of poles	Power up again.	P	S	T

1 to 50 pairs of poles

F00.19	Stator resistance Rs	Setting range	factory value	unit	Mode of entry into force	Related models		
		1 to 65535	500	0.001Ω	Power up again.	P	S	T

0.001Ω ~ 65.535Ω

F00.20	d-axis inductance Ld	Setting range	factory value	unit	Mode of entry into force	Related models		
		1 to 65535	387	0.01mH	Power up again.	P	S	T

0.01mH ~ 655.35mH

F00.21	q-axis inductance Lq	Setting range	factory value	unit	Mode of entry into force	Related models		
		1 to 65535	327	0.01mH	Power up again.	P	S	T

0.01mH ~ 655.35mH

F00.22	Inverse potential factor (32 bits)	Setting range	factory value	unit	Mode of entry into force	Related models		
		1 to 1,000,000	3330	0.01mV/rpm	Power up again.	P	S	T

0.01mV/rpm ~ 10000.00mV/rpm

F00.24	Torque coefficient	Setting range	factory value	unit	Mode of entry into force	Related models		
		0 ~ 65535	610	0.001N-m/A	Power up again.	P	S	T

0.001N-m/A to 65.35N-m/A

F00.25	Initial position of the absolute code disk (32 bits)	Setting range	factory value	unit	Mode of entry into force	Related models		
		0 ~ 1073741824	0	--	Power up again.	P	S	T

0 ~ 1073741824

F00.27	Encoder selection	Setting range	factory value	unit	Mode of entry into force	Related models		
		0 to 9	5	--	Power up again.	P	S	T

0:Incremental quadrature pulse encoder

1:17bit asynchronous serial bus encoder

3:23-bit custom protocol encoder

4:20-bit custom protocol encoder

5:23 Bit Asynchronous Serial Bus Encoder

9:Full data BISS-C bus encoder

F00.29	Encoder resolution (32 bit)	Setting range	factory	unit	Mode of	Related

			value		entry into force	models		
		1 to 1073741824	131072	1PPR	Power up again.	P	S	T

1PPR ~ 1073741824PPR (Incremental type optical encoder corresponds to the number of lines X4, bus type corresponds to the number of resolutions)

F00.31	Z rising edge corresponds to the electrical angle	Setting range	factory value	unit	Mode of entry into force	Related models		
		0 to 3600	0	0.1°	Power up again.	P	S	T

0.0° ~ 360.0°

F00.32	Weak magnetic coefficient	Setting range	factory value	unit	Mode of entry into force	Related models		
		0 to 160	0	--	Power up again.	P	S	T

0 to 20

F00.33	Motor code backup (32-bit)	Setting range	factory value	unit	Mode of entry into force	Related models		
		0 to 2147483647	0	--	Display only	P	S	T

Backup motor model code for comparison

F00.41	DDL Motor Pole Pitch (N-N)	Setting range	factory value	unit	Mode of entry into force	Related models		
		1 to 32767	1000	0.01mm	Power up again.	P	S	T

0.01 to 327.67 mm

F00.42	DDL scale resolution	Setting range	factory value	unit	Mode of entry into force	Related models		
		1 to 32767	100	0.01um	Power up again.	P	S	T

0.01 to 327.67 um

F00.43	DDL motor current rating	Setting range	factory value	unit	Mode of entry into force	Related models		
		1 to 10,000	100	0.01A	Power up again.	P	S	T

0.01A ~ 100.00A

F00.44	DDL rated thrust	Setting range	factory value	unit	Mode of entry into force	Related models		
		1 to 30,000	800	0.1N	Power up again.	P	S	T

0.1 to 3000.0 N

F00.45	DDL maximum thrust theoretical value	Setting range	factory value	unit	Mode of entry into force	Related models		
		1 to 60,000	3200	0.1N	Power up again.	P	S	T

0.1 to 6000.0 N

F00.46	DDL motor maximum speed	Setting range	factory value	unit	Mode of entry into force	Related models		
		1 to 30,000	3000	1mm/s	Power up again.	P	S	T

0 ~ 30,000mm/s

F00.48	DDL electric motor mass	Setting range	factory value	unit	Mode of entry into force	Related models		
		1 to 30,000	50	0.01 kg	Power up again.	P	S	T

0.01 to 300.00 kg

F00.49	DDL Stator Line Resistance	Setting range	factory value	unit	Mode of entry into force	Related models		
		1 to 65535	10000	0.001 Ohm	Power up again.	P	S	T

0.001Ω ~ 65.535Ω

F00.50	DDL motor wire inductor	Setting range	factory value	unit	Mode of entry into force	Related models		
		1 to 65535	1000	0.01mH	Power up again.	P	S	T

0.01mH ~ 655.35mH

F00.52	DDL inverse potential coefficient (32 bits)	Setting range	factory value	unit	Mode of entry into force	Related models		
		1 to 500000	4000	0.01V/mps	Power up again.	P	S	T

0.01 V/mps ~ 5000.00 V/mps

F00.54	DDL/DDR motor Z-electric angle	Setting range	factory value	unit	Mode of entry into force	Related models		
		0 to 3600	0	0.1°	Power up again.	P	S	T

0.0° ~ 360.0°

F00.59	DDL/DDR pole finding sign	Setting range	factory value	unit	Mode of entry into force	Related models		
		0 ~ 1	0	--	Downtime in effect	P	S	T

0:not found

1:Already corrected

F00.60	Straight axis current loop proportional gain 1	Setting range	factory value	unit	Mode of entry into force	Related models		
		1 to 5000	900	--	Effective immediately	P	S	T

F00.61	Straight axis current loop proportional gain 2	Setting range	factory value	unit	Mode of entry into force	Related models		
		1 to 5000	700	--	Effective immediately	P	S	T

F00.62	Cross-axis current loop proportional gain 1	Setting range	factory value	unit	Mode of entry into force	Related models		
		1 to 5000	900	--	Effective immediately	P	S	T

F00.63	Cross-axis current loop proportional gain 2	Setting range	factory value	unit	Mode of entry into force	Related models		
		1 to 5000	400	--	Effective immediately	P	S	T

F00.64	Current loop integration gain 1	Setting range	factory value	unit	Mode of entry into force	Related models		
		1 to 3000	2000	--	Effective immediately	P	S	T

F00.65	Current loop integration gain 2	Setting range	factory value	unit	Mode of entry into force	Related models		
		1 to 3000	2000	--	Effective immediately	P	S	T

F00.66	Counter-potential compensation factor	Setting range	factory value	unit	Mode of entry into force	Related models		
		0 to 2000	1000	--	Effective immediately	P	S	T

F00.67	Straight axis voltage compensation factor	Setting range	factory value	unit	Mode of entry into force	Related models

		0 to 2000	**1000**	**--**	**Effective immediately**	**P**	**S**	**T**

F00.68	**Cross-axis voltage compensation factor**	**Setting range**	**factory value**	**unit**	**Mode of entry into force**	**Related models**		
		0 to 2000	**500**	**--**	**Effective immediately**	**P**	**S**	**T**

Group F01 Basic parameters

F01.00	Manufacturer Parameters	Setting range	factory value	unit	Mode of entry into force	Related models		
		0 ~ 65535	1	--	Display only	P	S	T

0 ~ 65535

F01.01	Control mode selection	Setting range	factory value	unit	Mode of entry into force	Related models		
		0 to 9	9	--	Downtime in effect	P	S	T

YSK2-D: 0:Position mode
1:Speed Mode
2:Torque mode
3:Position mode/velocity mixed mode
4:Position Mode/Torque Mixing Mode
5:Speed mode/torque mixing mode
8: Communication control

YSK2-A: 0: Position mode
1: Speed Mode
2: Torque mode
3:Position mode/velocity mixing mode
4 : Position Mode/Torque Mixing Mode
5:Speed mode/torque mixing mode

YSK2-E: 0:Position mode
1:Speed Mode
2:Torque mode
3:Position mode/velocity mixed mode
4:Position Mode/Torque Mixing Mode
5:Speed mode/torque mixing mode
9: Communication control

F01.02	Real-time self-adjusting mode	Setting range	factory value	unit	Mode of entry into force	Related models

		Setting range	factory value	unit	Mode of entry into force	Related models		
		0 to 3	**1**	**--**	**Effective immediately**	**P**	**S**	**T**

0:Invalid
1:Standard mode (no gain switching)
2:Positioning mode (with gain switching)
3:Dynamic testing of load characteristics without setting parameters

F01.03	**Rigidity level setting**	**Setting range**	**factory value**	**unit**	**Mode of entry into force**	**Related models**		
		0 to 31	**12**	**--**	**Effective immediately**	**P**	**S**	**T**

0 to 31

F01.04	**inertia ratio**	**Setting range**	**factory value**	**unit**	**Mode of entry into force**	**Related models**		
		0 to 6000	**100**	**0.01**	**Effective immediately**	**P**	**S**	**T**

0 to 60.00

F01.05	**Location command source**	**Setting range**	**factory value**	**unit**	**Mode of entry into force**	**Related models**		
		0 to 3	**0**	**--**	**Downtime in effect**	**P**	**S**	**T**

0:Pulse command(A)
1:Step amount given
2:Multi-segment position command
3:High-speed pulse command(A)

F01.07	**Pulse String Pattern**	**Setting range**	**factory value**	**unit**	**Mode of entry**	**Related models**

					into force			
		0 to 5	0	--	Power up again.	P		

0:Direction + Pulse, positive logic. (default value) (A)

1:Direction + Pulse, Negative Logic(A)

2:A-phase(Pulse)+B-phase(sign) quadrature pulse, 4 times frequency, positive logic(A)

3:A-phase + B-phase quadrature pulse, 4x frequency, negative logic(A)

4:CW+CCW, positive logic(A)

5:CW+CCW, negative logic(A)

F01.08	High-speed burst pattern	Setting range	factory value	unit	Mode of entry into force	Related models		
		0 to 5	0	--	Power up again.	P		

0:Direction + Pulse, positive logic. (default value) (A)

1:Direction + Pulse, Negative Logic (A)

2:A-phase(Pulse)+B-phase(sign) quadrature pulse, 4 times frequency, positive logic (A)

3:A-phase + B-phase quadrature pulse, 4x frequency, negative logic (A)

4:CW+CCW, positive logic (A)

5:CW+CCW, negative logic (A)

F01.09	Number of instructions required to rotate the motor one revolution (32 bits)	Setting range	factory value	unit	Mode of entry into force	Related models		
		0 to 2147483647	10000	1Unit	Power up again.	P		

0 Unit/Turn ~ 1073741824 Unit/Turn

F01.11	Number of pulse lines output in one revolution of the rotating motor (32 bits)	Setting range	factory value	unit	Mode of entry into force	Related models		
		16 to 2147483647	2500	1PPR	Power up again.	P		

16PPR ~ 1073741824PPR (Number of corresponding lines by incremental optical encoder)

F01.13	Definition of the positive direction of the pulse output	Setting range	factory value	unit	Mode of entry into force	Related models		
		0 ~ 1	0	--	Power up again.	P	S	T

0:velocity is positive, OA overtakes OB

1:Negative velocity, OA ahead of OB

F01.14	Pulse output OZ polarity	Setting range	factory value	unit	Mode of entry into force	Related models		
		0 to 3	0	--	Power up again.	P		

0:High level when Z pulse is coming

1:Low level when Z pulse impulse comes

2:High precision Z pulse, high level when Z pulse comes

3:High precision Z pulse, low level when Z pulse is coming

F01.15	Pulse output function selection	Setting range	factory value	unit	Mode of entry into force	Related models		
		0 to 3	0	--	Power up again.	P		

0:Encoder crossover output

1:Pulse command synchronous output

2:Pulse command interpolation output (Gantry synchronization)

3:External encoder pulse synchronization output

F01.16	Position Deviation Excess Threshold (32 bits)	Setting range	factory value	unit	Mode of entry into force	Related models		
		1 to 2147483647	10000000	1P	Effective immediately	P	S	T

1P ~ 1073741824P

F01.18	Energy brake setting	Setting range	factory value	unit	Mode of entry into force	Related models		
		0 to 2	1	--	Effective immediately	P	S	T

0:Use built-in energy resistor (100s)

1: Use external energy resistors and natural cooling (150s) or forced air cooling (200s)

F01.19	External resistor power capacity	Setting range	factory value	unit	Mode of entry into force	Related models		
		1 to 65535	100	1W	Effective immediately	P	S	T

1W to 65535W

F01.20	External resistor resistance value	Setting range	factory value	unit	Mode of entry into force	Related models		
		1 to 1000	100	1Ω	Effective immediately	P	S	T

User settable

1Ω ~ 1000Ω

F01.21	External resistor heating time constant	Setting range	factory value	unit	Mode of entry into force	Related models		
		1 to 30,000	2000	0.1s	Effective immediately	P	S	T

Automatic system setting, user adjustable

0.1s ~ 3000.0s

F01.22	Braking voltage point	Setting range	factory	unit	Mode of	Related

			value		entry into force	models		
		0 ~ 65535	385	--	Effective immediately	P	S	T

0V to 1000V (default is usually sufficient)

F01.23	Position step amount setting	Setting range	factory value	unit	Mode of entry into force	Related models		
		-9999 to 9999	50	--	Effective immediately	P		

-9999 to 9999 command units

F01.30	Definition of positive direction of motor rotation	Setting range	factory value	unit	Mode of entry into force	Related models		
		0 ~ 1	0	--	Power up again.	P	S	T

0:Same as the default direction of the motor

1:Opposite to the default direction of the motor

Group F02 Basic Gain Group

F02.00	First position loop gain	Setting range	factory value	unit	Mode of entry into force	Related models		
		10 to 20,000	400	0.1/s	Effective immediately	P		

1.0/s to 2000.0/s

F02.01	First speed loop gain	Setting range	factory value	unit	Mode of entry into force	Related models		
		10 to 20,000	200	0.1HZ	Effective immediately	P	S	

1.0Hz ~ 2000.0Hz

F02.02	First velocity loop integration time	Setting range	factory value	unit	Mode of entry into force	Related models		
		15 to 51200	3000	0.01ms	Effective immediately	P	S	

0.15ms ~ 512.00ms

F02.03	First speed detection filtering	Setting range	factory value	unit	Mode of entry into force	Related models		
		0 to 15	0	--	Effective immediately	P	S	T

Sets the filtering level for speed detection.

0 to 15

The higher the value, the better the vibration suppression, but it will reduce the response bandwidth.

F02.04	First torque command filtering	Setting range	factory value	unit	Mode of entry into force	Related models		
		0 to 10000	100	0.01ms	Effective immediately	P	S	T

0.00ms ~ 100.00ms

F02.05	Second position loop gain	Setting range	factory value	unit	Mode of entry into force	Related models		
		10 to 20,000	400	0.1/s	Effective immediately	P		

1.0/s to 2000.0/s

F02.06	Second speed loop gain	Setting range	factory value	unit	Mode of entry into force	Related models		
		10 to 20,000	200	0.1HZ	Effective immediately	P	S	

1.0Hz ~ 2000.0Hz

F02.07	Second velocity loop integration time	Setting range	factory value	unit	Mode of entry into force	Related models		
		15 to 51200	3000	0.01ms	Effective immediately	P	S	

0.15ms ~ 512.00ms

F02.08	Second speed detection filtering	Setting range	factory value	unit	Mode of entry into force	Related models		
		0 to 15	0	--	Effective immediately	P	S	T

Sets the filtering level for speed detection.

0 to 15

The higher the value, the better the vibration suppression, but it will reduce the response bandwidth.

F02.09	Second torque command filtering	Setting range	factory value	unit	Mode of entry into force	Related models		
		0 to 10000	100	0.01ms	Effective immediately	P	S	T

0.00ms ~ 100.00ms

F02.10	Velocity loop PDFF factor	Setting range	factory value	unit	Mode of entry into force	Related models		
		0 to 1000	1000	0.1%	Effective immediately	P	S	

0 to 100.0%

F02.11	Speed Feedforward Selection	Setting range	factory value	unit	Mode of entry into force	Related models		
		0 ~ 1	0	--	Downtime in effect	P		

0:No speed feed forward

1:Internal speed feedforward

F02.12	Speed feedforward gain	Setting range	factory value	unit	Mode of entry into force	Related models		
		0 ~ 1500	300	0.1%	Effective immediately	P		

0.0% to 100.0%

F02.13	Speed feed-forward filtering time	Setting range	factory value	unit	Mode of entry into force	Related models		
		0 to 6400	50	0.01ms	Effective immediately	P		

0.00ms ~ 64.00ms

F02.14	Torque feedforward selection	Setting range	factory value	unit	Mode of entry into force	Related models		
		0 to 2	0	--	Downtime in effect	P	S	

0:No torque feedforward

1:Internal torque feedforward

2:Use TFFD as a torque feedforward input

F02.15	Torque feedforward gain	Setting range	factory value	unit	Mode of entry into force	Related models		
		0 to 1000	0	0.1%	Effective immediately	P	S	

0.0% to 100.0%

F02.16	Torque feed-forward filtering time	Setting range	factory value	unit	Mode of entry	Related models

					into force			
		0 to 6400	**0**	**0.01ms**	**Effective immediately**	**P**	**S**	

0.00ms ~ 64.00ms

F02.17	**DI function GAIN-SWITCH switching action selection**	**Setting range**	**factory value**	**unit**	**Mode of entry into force**	**Related models**		
		0 ~ 1	**0**	**--**	**Effective immediately**	**P**	**S**	

0:Speed loop regulator P(1)/PI(0) switch, gain fixed to the first group

1:First gain (0), second gain (1) switching

F02.18	**Position control switching mode**	**Setting range**	**factory value**	**unit**	**Mode of entry into force**	**Related models**		
		0 to 10	**0**	**--**	**Effective immediately**	**P**	**S**	

0:First gain fixed

1:Second gain fixed

2: Using DI input (GAIN-SWITCH)

3:Large torque command

4:Large variation in speed command

5:Large speed command

6:Large position deviation (P)

7:With position command (P)

8: Positioning not completed (P)

9:Large actual speed (P)

10:With position command plus actual speed (P)

F02.19	**Position control switching delay**	**Setting range**	**factory value**	**unit**	**Mode of entry into force**	**Related models**		
		0 to 1000	**50**	**0.1ms**	**Effective**	**P**	**S**	

					immediately			

0 ~ 100.0ms

F02.20	**Position control switching level**	**Setting range**	**factory value**	**unit**	**Mode of entry into force**	**Related models**		
		0 to 20,000	**50**	**--**	**Effective immediately**	**P**	**S**	

0 to 20000 (units - according to gain switching mode description)

F02.21	**Position control switching hysteresis**	**Setting range**	**factory value**	**unit**	**Mode of entry into force**	**Related models**		
		0 to 20,000	**33**	**--**	**Effective immediately**	**P**	**S**	

0 to 20000 (units - according to gain switching mode description)

F02.22	**Position gain switching time**	**Setting range**	**factory value**	**unit**	**Mode of entry into force**	**Related models**		
		0 to 10000	**33**	**0.1ms**	**Effective immediately**	**P**	**S**	

0 ~ 1000.0ms

F02.23	**Speed control switching mode**	**Setting range**	**factory value**	**unit**	**Mode of entry into force**	**Related models**		
		0 to 5	**0**	**--**	**Effective immediately**		**S**	

0:First gain fixed

1:Second gain fixed

2: Using DI input (GAIN-SWITCH)
3:Large torque command
4:Large variation in speed command
5:Large speed command

F02.24	Speed Control Switching Delay	Setting range	factory value	unit	Mode of entry into force	Related models		
		0 to 1000	0	0.1ms	Effective immediately		S	

0 ~ 100.0ms

F02.25	Speed control switching level	Setting range	factory value	unit	Mode of entry into force	Related models		
		0 to 20,000	0	--	Effective immediately		S	

0 to 20000 (units - according to gain switching mode description)

F02.26	Speed control switching back lag	Setting range	factory value	unit	Mode of entry into force	Related models		
		0 to 20,000	0	--	Effective immediately		S	

0 to 20000 (units - according to gain switching mode description)

F02.27	Torque control switching mode	Setting range	factory value	unit	Mode of entry into force	Related models		
		0 to 3	0	--	Effective immediately			T

0:First gain fixed

1:Second gain fixed
2: Using DI input (GAIN-SWITCH)
3:Large torque command

F02.28	Torque control switching delay	Setting range	factory value	unit	Mode of entry into force	Related models		
		0 to 1000	0	0.1ms	Effective immediately			T

0 ~ 100.0ms

F02.29	Torque control switching level	Setting range	factory value	unit	Mode of entry into force	Related models		
		0 to 20,000	0	--	Effective immediately			T

0 to 20000 (units - according to gain switching mode description)

F02.30	Torque control switching hysteresis	Setting range	factory value	unit	Mode of entry into force	Related models		
		0 to 20,000	0	--	Effective immediately			T

0 to 20000 (units - according to gain switching mode description)

F02.31	Observer enabled	Setting range	factory value	unit	Mode of entry into force	Related models		
		0 to 2	0	--	Downtime in effect	P	S	T

0:Not enabled
1:Debugging

2:Enable

F02.32	Observer cut-off frequency	Setting range	factory value	unit	Mode of entry into force	Related models		
		0 to 500	100	1Hz	Downtime in effect	P	S	T

0 ~ 500HZ

F02.33	Observer phase compensation time	Setting range	factory value	unit	Mode of entry into force	Related models		
		0 to 10000	0	0.01ms	Effective immediately	P	S	T

0.00 ~ 100.00ms

F02.34	Observer coefficient of inertia	Setting range	factory value	unit	Mode of entry into force	Related models		
		0 to 10000	1000	--	Downtime in effect	P	S	T

0 to 10000

F02.38	Current response trim factor	Setting range	factory value	unit	Mode of entry into force	Related models		
		0 to 1200	600	--	Downtime in effect	P	S	T

0 to 1200 (valid for all motors)

F02.40	Position command	Setting range	factory	unit	Mode of	Related

	smoothing filtering		value		entry into force	models		
		0 ~ 65535	0	0.1ms	Effective immediately	P		

0.0ms ~ 6553.5ms

F02.41	Position command averaging filtering	Setting range	factory value	unit	Mode of entry into force	Related models		
		0 to 5120	0	0.1ms	Effective immediately	P		

0.0ms ~ 512.0ms

F02.42	Position command average filtering 2	Setting range	factory value	unit	Mode of entry into force	Related models		
		0 to 5120	0	0.1ms	Effective immediately	P		

0.0ms ~ 512.0ms

Group F03 Enhanced Performance Group

F03.00	Adaptive filter mode	Setting range	factory value	unit	Mode of entry into force	Related models		
		0 to 4	0	--	Effective immediately	P	S	T

0:Adaptive invalid, 3rd,4th filter works but parameters are unchanged
1:1 adaptive filter valid (3rd filter parameters updated according to adaptive results)
2:2 adaptive filters valid (3rd and 4th filter parameters updated according to adaptive results)
3:Resonant frequency measurement, results are displayed but filter parameters are not updated
4:Clear adaptive results (adaptive is invalid and filters 3 and 4 do not work)

F03.01	Adaptive filtered load mode	Setting range	factory value	unit	Mode of entry into force	Related models		
		0 ~ 1	0	--	Effective immediately	P	S	T

0: Highly rigid load
1:Low rigid load

F03.02	1st trap frequency (manual)	Setting range	factory value	unit	Mode of entry into force	Related models		
		50 to 5000	5000	1Hz	Effective immediately	P	S	T

50 ~ 5000Hz

F03.03	Width of the 1st trap	Setting range	factory value	unit	Mode of entry	Related models

					into force			
		0 to 12	2	--	Effective immediately	P	S	T

0 to 12

F03.04	1st trap depth	Setting range	factory value	unit	Mode of entry into force	Related models		
		0 to 99	0	--	Effective immediately	P	S	T

0 to 99

F03.05	2nd trap frequency (manual)	Setting range	factory value	unit	Mode of entry into force	Related models		
		50 to 5000	5000	1Hz	Effective immediately	P	S	T

50 ~ 5000Hz

F03.06	2nd trap width	Setting range	factory value	unit	Mode of entry into force	Related models		
		0 to 12	2	--	Effective immediately	P	S	T

0 to 12

F03.07	2nd trap depth	Setting range	factory value	unit	Mode of entry into force	Related models		
		0 to 99	0	--	Effective immedia	P	S	T

					tely			

0 to 99

F03.08	**3rd trap frequency**	**Setting range**	**factory value**	**unit**	**Mode of entry into force**	**Related models**		
		50 to 5000	**5000**	**1Hz**	**Effective immediately**	**P**	**S**	**T**

50 ~ 5000Hz

F03.09	**3rd trap width**	**Setting range**	**factory value**	**unit**	**Mode of entry into force**	**Related models**		
		0 to 12	**2**	**--**	**Effective immediately**	**P**	**S**	**T**

0 to 12

F03.10	**3rd trap depth**	**Setting range**	**factory value**	**unit**	**Mode of entry into force**	**Related models**		
		0 to 99	**0**	**--**	**Effective immediately**	**P**	**S**	**T**

0 to 99

F03.11	**4th trap frequency**	**Setting range**	**factory value**	**unit**	**Mode of entry into force**	**Related models**		
		50 to 5000	**5000**	**1Hz**	**Effective immediately**	**P**	**S**	**T**

50 ~ 5000Hz

F03.12	4th trap width	Setting range	factory value	unit	Mode of entry into force	Related models		
		0 to 12	2	--	Effective immediately	P	S	T

0 to 12

F03.13	4th trap depth	Setting range	factory value	unit	Mode of entry into force	Related models		
		0 to 99	0	--	Effective immediately	P	S	T

0 to 99

F03.17	Post Torque Filter	Setting range	factory value	unit	Mode of entry into force	Related models		
		0 to 10000	5	0.01ms	Effective immediately	P	S	T

F03.20	1st damping frequency (low frequency vibration control)	Setting range	factory value	unit	Mode of entry into force	Related models		
		0 to 1000	0	0.1Hz	Effective immediately	P	S	

10.0HZ ~ 100.0HZ

F03.21	1st damping filter setting	Setting range	factory value	unit	Mode of entry into force	Related models

		0 to 10	**0**	**0.1**	**Effective immediately**	**P**	**S**	

0 ~ 1.0

F03.22	**2nd damping frequency (low frequency vibration control)**	**Setting range**	**factory value**	**unit**	**Mode of entry into force**	**Related models**		
		0 to 1000	**0**	**0.1Hz**	**Effective immediately**	**P**	**S**	

10HZ ~ 100HZ

F03.23	**2nd damping filter setting**	**Setting range**	**factory value**	**unit**	**Mode of entry into force**	**Related models**		
		0 to 10	**0**	**0.1**	**Effective immediately**	**P**	**S**	

0 ~ 1.0

F03.29	**Resonance point 1 frequency**	**Setting range**	**factory value**	**unit**	**Mode of entry into force**	**Related models**		
		0 to 5000	**5000**	**1Hz**	**Display only**	**P**	**S**	**T**

0 ~ 5000Hz

F03.30	**Resonance point 1 frequency width**	**Setting range**	**factory value**	**unit**	**Mode of entry into force**	**Related models**		
		0 to 20	**2**	**--**	**Display only**	**P**	**S**	**T**

0 to 20

F03.31	Resonance point 1 amplitude	Setting range	factory value	unit	Mode of entry into force	Related models		
		0 to 1000	0	--	Display only	P	S	T

0 to 1000

F03.32	Resonance point 2 frequency	Setting range	factory value	unit	Mode of entry into force	Related models		
		0 to 5000	5000	1Hz	Display only	P	S	T

0 ~ 5000Hz

F03.33	Resonance point 2 frequency width	Setting range	factory value	unit	Mode of entry into force	Related models		
		0 to 20	2	--	Display only	P	S	T

0 to 20

F03.34	Resonance point 2 amplitude	Setting range	factory value	unit	Mode of entry into force	Related models		
		0 to 1000	0	--	Display only	P	S	T

0 to 1000

F03.35	Gravity load compensation value	Setting range	factory value	unit	Mode of entry into force	Related models		
		-100 to 100	0	1%	Effective immediately	P	S	

Compensation of gravity load, setting range -100% to 100%

F03.36	Load Compensation Storage Options	Setting range	factory value	unit	Mode of entry into force	Related models		
		0 to 2	2	--	Effective immediately	P	S	

0:Auto update, power down storage

1:Automatic update, power down to restore the initial value

2:No automatic update

F03.37	Positive friction torque compensation	Setting range	factory value	unit	Mode of entry into force	Related models		
		-3000 to 3000	0	0.1%	Effective immediately	P	S	

0.1% of torque units (-300.0 to 300.0)

F03.38	Reverse friction torque compensation	Setting range	factory value	unit	Mode of entry into force	Related models		
		-3000 to 3000	0	0.1%	Effective immediately	P	S	

0.1% of torque units (-300.0 to 300.0)

F03.39	Viscous friction compensation	Setting range	factory value	unit	Mode of entry into force	Related models		
		-3000 to 3000	0	0.1%	Effective immediately	P	S	

0.1% of torque units (-300.0 to 300.0)

F03.41	Friction compensation time constant	Setting range	factory value	unit	Mode of entry into force	Related models		
		0 to 10000	0	0.1ms	Effective immediately	P	S	

0.1ms unit (0 to 1000.0ms)

F03.42	Friction compensation low speed range	Setting range	factory value	unit	Mode of entry into force	Related models		
		0 to 500	1	1rpm	Effective immediately	P	S	

0 to 500rpm

F03.43	Slot torque compensation options	Setting range	factory value	unit	Mode of entry into force	Related models		
		0 ~ 1	0	--	Effective immediately	P	S	

F03.44	Parameter recognition speed value	Setting range	factory value	unit	Mode of entry into force	Related models		
		100 to 1000	500	--	Downtime in effect	P	S	

100 to 1000rpm

F03.45	Parameter identification acceleration time	Setting range	factory value	unit	Mode of entry into force	Related models

		50 to 10000	**100**	**--**	**Downtime in effect**	**P**	**S**	

50 to 10000ms

F03.46	**Parameter identification deceleration time**	**Setting range**	**factory value**	**unit**	**Mode of entry into force**	**Related models**		
		50 to 10000	**100**	**--**	**Downtime in effect**	**P**	**S**	

50 to 10000ms

F03.47	**Parameter recognition mode**	**Setting range**	**factory value**	**unit**	**Mode of entry into force**	**Related models**		
		0 ~ 1	**0**	**--**	**Downtime in effect**	**P**	**S**	

0: no automatic updating of inertia in case of automatic adjustment.

1:Automatic update of inertia during automatic adjustment

F03.48	**Angular discrimination and pole-seeking phase currents**	**Setting range**	**factory value**	**unit**	**Mode of entry into force**	**Related models**		
		0 to 2000	**500**	**0.1%**	**Downtime in effect**	**P**	**S**	**T**

0 to 200.0%

F03.49	**Magnetic pole phase finding method**	**Setting range**	**factory value**	**unit**	**Mode of entry into force**	**Related models**		
		0 ~ 1	**1**	**--**	**Downtime in effect**	**P**	**S**	**T**

0:Direct Positioning Phase Finding
1:Micro-motion phase search
2:Closed loop direct positioning phase finding
3:Quasi-static current injection phase finding

F03.50	Micro-motion phase seeking action threshold	Setting range	factory value	unit	Mode of entry into force	Related models		
		1 to 10,000	100	--	Downtime in effect	P	S	T

1 to 10000 (10000 corresponds to 1 turn or 1 pair of poles)

F03.51	Micro-motion phase-seeking stationary threshold	Setting range	factory value	unit	Mode of entry into force	Related models		
		1 to 10,000	10	--	Downtime in effect	P	S	T

1 to 10000 (10000 corresponds to 1 turn or 1 pair of poles)

F03.52	Direct positioning of phase angle	Setting range	factory value	unit	Mode of entry into force	Related models		
		0 ~ 360	0	1°	Downtime in effect	P	S	T

0 ~ 360 degrees

F03.54	Closed-loop pre-positioning phase finding fast and slow	Setting range	factory value	unit	Mode of entry into force	Related models		
		0 to 100	0	--	Downtime in effect	P	S	T

0 to 100 (the higher the value, the faster it is)

F03.55	Phase-seeking movable range	Setting range	factory value	unit	Mode of entry into force	Related models		
		0 to 1000	100	0.01	Downtime in effect	P	S	T

0.01: 10.00 turns (pitch)

F03.56	Magnetic pole phase seeking line sequence identification switch	Setting range	factory value	unit	Mode of entry into force	Related models		
		0 ~ 1	0	--	Downtime in effect	P	S	T

0:No identification of motor power line UVW phase sequence

1:Identify motor power line UVW phase sequence

F03.57	Allowable range of phase finding error	Setting range	factory value	unit	Mode of entry into force	Related models		
		0 to 45	20	1°	Downtime in effect	P	S	T

0 to 45 degrees

F03.58	Finding the opposite direction of the flying car determination threshold	Setting range	factory value	unit	Mode of entry into force	Related models		
		0 to 100	0	--	Downtime in effect	P	S	T

0 to 100 (100 corresponds to the rated speed of the motor)

F03.59	Overspeed determination	Setting range	factory	unit	Mode of	Related

	threshold in phase finding		value		entry into force	models		
		0 to 150	0	--	Downtime in effect	P	S	T

0 to 150 (100 corresponds to the rated speed of the motor)

F03.60	Hall U1V0W1 corresponds to the electrical angle	Setting range	factory value	unit	Mode of entry into force	Related models		
		0 to 360	30	1°	Downtime in effect	P	S	T

0 ~ 360 degrees

F03.61	Hall U1V0W0 Corresponding electrical angle	Setting range	factory value	unit	Mode of entry into force	Related models		
		0 to 360	90	1°	Downtime in effect	P	S	T

0 ~ 360 degrees

F03.62	Hall U1V1W0 corresponds to the electrical angle	Setting range	factory value	unit	Mode of entry into force	Related models		
		0 to 360	150	1°	Downtime in effect	P	S	T

0 ~ 360 degrees

F03.63	Hall U0V1W0 Corresponding electrical angle	Setting range	factory value	unit	Mode of entry into force	Related models		
		0 ~ 360	210	1°	Downtim	P	S	T

					e in effect			

0 ~ 360 degrees

F03.64	Hall U0V1W1 corresponds to the electrical angle	Setting range	factory value	unit	Mode of entry into force	Related models		
		0 ~ 360	270	1°	Downtime in effect	P	S	T

0 ~ 360 degrees

F03.65	Hall U0V0W1 Corresponding electrical angle	Setting range	factory value	unit	Mode of entry into force	Related models		
		0 ~ 360	330	1°	Downtime in effect	P	S	T

0 ~ 360 degrees

F03.66	Mode 3 phase seeking current amplitude	Setting range	factory value	unit	Mode of entry into force	Related models		
		0 to 100	50	1%	Downtime in effect	P	S	T

0 to 100%

F03.69	Model Tracking Options	Setting range	factory value	unit	Mode of entry into force	Related models		
		0 to 9	0	--	Effective immediately	P		

0: Model tracking is not enabled

1:Enable model 1, external feedforward is invalid

2:Enable model 1, external feedforward valid
3:Enable model 2, external feedforward is invalid
4:Enable model 2, external feedforward valid

F03.70	Model tracking gain	Setting range	factory value	unit	Mode of entry into force	Related models		
		10 to 20,000	500	0.1/s	Effective immediately	P		

1.0 ~ 2000.0 /S

F03.71	Model tracking compensation factor	Setting range	factory value	unit	Mode of entry into force	Related models		
		500 to 2000	1000	0.1%	Effective immediately	P		

50.0 to 200.0%

F03.72	Model tracking speed compensation gain	Setting range	factory value	unit	Mode of entry into force	Related models		
		0 to 2000	1000	0.1%	Effective immediately	P		

0.0 to 200.0%

F03.73	Model tracking torque compensation gain 1	Setting range	factory value	unit	Mode of entry into force	Related models		
		0 to 10000	1000	0.1%	Effective immediately	P		

0.0 to 1000.0%

F03.74	Model tracking torque compensation gain 2	Setting range	factory value	unit	Mode of entry into force	Related models		
		0 to 10000	1000	0.1%	Effective immediately	P		

0.0 to 1000.0%

F03.75	Model anti-resonance frequency	Setting range	factory value	unit	Mode of entry into force	Related models		
		10 to 2000	500	0.1HZ	Effective immediately	P		

1.0 ~ 200.0HZ

F03.76	Model residual vibration frequency	Setting range	factory value	unit	Mode of entry into force	Related models		
		10 to 2000	700	0.1HZ	Effective immediately	P		

1.0 ~ 200.0HZ

F03.77	Model delay bandwidth parameters	Setting range	factory value	unit	Mode of entry into force	Related models		
		0 to 30,000	4500	0.1HZ	Effective immediately	P		

0 ~ 3000.0HZ

F03.78	Model delay compensation parameters	Setting range	factory value	unit	Mode of entry into	Related models

					force			
		500 to 1500	800	--	Effective immediately	P		

500 to 1500

F03.81	Second model tracking gain	Setting range	factory value	unit	Mode of entry into force	Related models		
		10 to 20,000	500	0.1/s	Effective immediately	P		

1.0 ~ 2000.0 /S

F03.82	Second model tracking compensation factor	Setting range	factory value	unit	Mode of entry into force	Related models		
		500 to 2000	1000	0.1%	Effective immediately	P		

50.0 to 200.0%

F03.83	Is low frequency vibration suppression effective	Setting range	factory value	unit	Mode of entry into force	Related models		
		0 ~ 1	0	--	Effective immediately			

0:Invalid
1:Effective

F03.84	Vibration suppression frequency point	Setting range	factory value	unit	Mode of entry into force	Related models		
		10 to 2000	800	0.1HZ	Effective immedia	P		

					tely			

1.0 ~ 200.0HZ

F03.85	**Vibration suppression compensation factor**	**Setting range**	**factory value**	**unit**	**Mode of entry into force**	**Related models**		
		10 to 1000	**100**	**1%**	**Effective immediately**	**P**		

10% to 1000%

Group F04 Position Control

F04.00	First electron gear molecule (32 bits)	Setting range	factory value	unit	Mode of entry into force	Related models		
		1 to 1073741824	1	--	Effective immediately	P		

1 to 1073741824

F04.02	Electronic gear denominator (32 bits)	Setting range	factory value	unit	Mode of entry into force	Related models		
		1 to 1073741824	1	--	Effective immediately	P		

1 to 1073741824

F04.04	Second electron gear molecule (32 bits)	Setting range	factory value	unit	Mode of entry into force	Related models		
		1 to 1073741824	1	--	Effective immediately	P		

1 to 1073741824

F04.06	Pulse output frequency division ratio numerator (32 bits)	Setting range	factory value	unit	Mode of entry into force	Related models		
		1 to 1073741824	1	--	Effective	P		

					immedia tely			

1 to 1073741824

F04.08	**Pulse output divider than denominator (32 bits)**	**Setting range**	**factory value**	**unit**	**Mode of entry into force**	**Related models**		
		1 to 1073741824	**1**	**--**	**Effective immedia tely**	**P**		

1 to 1073741824

F04.10	**Position deviation clearance function**	**Setting range**	**factory value**	**unit**	**Mode of entry into force**	**Related models**		
		0 to 3	**0**	**--**	**Effective immedia tely**	**P**		

0: Servo OFF and clear position deviation pulse in case of fault

1: Position deviation pulse is cleared only in case of a fault

2:Cleared when the servo is OFF and when a fault occurs, and when the DI function (PERR_CLR) is active

3:Clear only by DI function (PERR_CLR)

F04.11	**Deviation clear input setting**	**Setting range**	**factory value**	**unit**	**Mode of entry into force**	**Related models**		
		0 ~ 1	**0**	**--**	**Power up again.**	**P**		

0:Level valid

1:Valid at the edge

F04.12	**Pulse disable input setting**	**Setting range**	**factory value**	**unit**	**Mode of entry into force**	**Related models**		
		0 to 3	**0**	**--**	**Power**	**P**		

					up again.			

0:0.5ms 2 consecutive times in unison
1:0.5ms 3 consecutive times consistent
2:1ms 3 consecutive times consistent
3:2ms 3 times in a row in unison

F04.13	**Electronic gear ratio switching delay setting**	**Setting range**	**factory value**	**unit**	**Mode of entry into force**	**Related models**		
		0 ~ 1	**0**	**--**	**Downtime in effect**	**P**		

0:Position command pulse is 0 for 10ms and then switch
1:Real-time switching

F04.31	**Position comparison output mode**	**Setting range**	**factory value**	**unit**	**Mode of entry into force**	**Related models**		
		0000H to 0003H	**0**	**--**	**Downtime in effect**	**P**		

0:No position comparison function is enabled
1:Positive trigger.
2:reverse trigger.
3:Two-way trigger.

F04.32	**Position 1 (32 bits)**	**Setting range**	**factory value**	**unit**	**Mode of entry into force**	**Related models**		
		-1073741824 ~ 1073741824	**0**	**--**	**Effective immediately**	**P**		

-1073741824 ~ 1073741824

F04.34	**Position 2 (32 bits)**	**Setting range**	**factory value**	**unit**	**Mode of entry into**	**Related models**

					force			
		-1073741824 ~ 1073741824	0	--	Effective immediately	P		

-1073741824 ~ 1073741824

F04.36	Position 3 (32 bits)	Setting range	factory value	unit	Mode of entry into force	Related models		
		-1073741824 ~ 1073741824	0	--	Effective immediately	P		

-1073741824 ~ 1073741824

F04.38	Position 4 (32 bits)	Setting range	factory value	unit	Mode of entry into force	Related models		
		-1073741824 ~ 1073741824	0	--	Effective immediately	P		

-1073741824 ~ 1073741824

F04.40	Signal validity time1	Setting range	factory value	unit	Mode of entry into force	Related models		
		0 ~ 65535	0	1ms	Effective immediately	P		

The time to output a valid signal 0 to 65535ms after reaching the 1st position

F04.41	Signal validity time2	Setting range	factory value	unit	Mode of entry into force	Related models		
		0 ~ 65535	0	1ms	Effective immediately	P		

The time to output a valid signal 0 to 65536ms after reaching the 1st position

F04.42	Signal validity time3	Setting range	factory value	unit	Mode of entry into force	Related models		
		0 ~ 65535	0	1ms	Effective immediately	P		

The time to output a valid signal 0 to 65537ms after reaching the 1st position

F04.43	Signal validity time4	Setting range	factory value	unit	Mode of entry into force	Related models		
		0 ~ 65535	0	1ms	Effective immediately	P		

The time to output a valid signal 0 to 65538ms after reaching the 1st position

F04.44	Display delay	Setting range	factory value	unit	Mode of entry into force	Related models		
		0 ~ 65535	0	1ms	Effective immediately	P		

0 ~ 65535ms

F04.46	Multi-segment position execution method	Setting range	factory value	unit	Mode of entry into force	Related models		
		0 to 5	0	--	Downtime in effect	P		

0:Single run

1:Cycle run

2:DI terminal switching operation

3:Communication switching operation

4: Single continuous run
5:Continuous cycle operation

F04.47	Multi-segment position command type	Setting range	factory value	unit	Mode of entry into force	Related models		
		0 ~ 1	0	--	Downtime in effect	P		

0:Relative command
1:Absolute command

F04.48	Multi-segment position internal control of waiting time	Setting range	factory value	unit	Mode of entry into force	Related models		
		0 ~ 65535	10	1ms	Downtime in effect	P		

0 ~ 65535ms

F04.49	Multi-segment location starting segment serial number	Setting range	factory value	unit	Mode of entry into force	Related models		
		1 to 16	1	--	Effective immediately	P		

1 to (F08:02)

F04.50	Multi-segment location end segment serial number	Setting range	factory value	unit	Mode of entry into force	Related models		
		1 to 16	2	--	Effective immediately	P		

(F08:01) - 16

F04.51	Multi-segment position pause and restart remaining segment handling	Setting range	factory value	unit	Mode of entry into force	Related models		
		0 ~ 1	1	--	Effective immediately	P		

0: Run the remaining segments

1: Run again from the start segment

F04.52	Interrupt length execution setting	Setting range	factory value	unit	Mode of entry into force	Related models		
		0 to 4	0	--	Downtime in effect	P		

0: disables the interrupt execution function.

1: enabled to interrupt on the rising edge of the DI signal and to automatically unlock the interrupt state after completion.

2: enabled, interrupting on the rising edge of the DI signal and unlocking the interrupt state after completion by means of the DI signal XINT_ULK.

3: enabled, interrupting on the falling edge of the DI signal and automatically unlocking the interrupt state upon completion.

4:Enable, interrupt on falling edge of DI signal, unlock interrupt state by DI signal XINT_ULK after completion

F04.53	Interrupting long electronic gear selection	Setting range	factory value	unit	Mode of entry into force	Related models		
		0000H to FFFFH	0	--	Downtime in effect	P		

0: Does not follow gear ratio adjustment

1:Follow gear ratio adjustment

F04.54	Interrupt positioning instruction direction selection	Setting range	factory value	unit	Mode of entry into	Related models

					force			
		0000H to FFFFH	0	--	Downtime in effect	P		

0:Follow the current running direction

1:Determined by the sign of the command value

F04.55	Interrupt length setting	Setting range	factory value	unit	Mode of entry into force	Related models		
		0 to 16	16	--	Downtime in effect	P		

Interrupt length setting

0 - Medium asserts that the long instruction is the first segment of a multi-segment instruction;

1 to 16 - Medium asserted long instruction as multi-segment instruction paragraph X

F04.56	Clear deviation setting when pulse is disabled	Setting range	factory value	unit	Mode of entry into force	Related models		
		0 ~ 1	0	--	Effective immediately	P	S	T

0:No automatic deviation clearing when pulse is disabled

1:Deviation is automatically cleared when pulse is disabled

F04.57	Pause selection during contour position control	Setting range	factory value	unit	Mode of entry into force	Related models		
		0 ~ 1	0	--	Effective immediately	P	S	T

0:No pause function is enabled

1:Enable the pause function

F04.58	Contour position pause resume selection	Setting range	factory value	unit	Mode of entry	Related models

					into force			
		0 ~ 1	**0**	**--**	**Effective immediately**	**P**	**S**	**T**

0: No deviation cleared

1: Removal of deviations

F04.59	**Motor one turn maximum isochronous fraction**	**Setting range**	**factory value**	**unit**	**Mode of entry into force**	**Related models**		
		0 to 99	**0**	**--**	**Effective immediately**	**P**		

Divide a circle of corresponding pulses into 0 to 99 parts

F04.60	**Non-absolute system position feedback initialization selection**	**Setting range**	**factory value**	**unit**	**Mode of entry into force**	**Related models**		
		0 ~ 1	**0**	**--**	**Power up again.**	**P**	**S**	**T**

0: initialized to 0.

1: Initialized to the value before power failure (requires power failure storage to be enabled, i.e., F1213 set to 1)

F04.61	**Positioning the completed range**	**Setting range**	**factory value**	**unit**	**Mode of entry into force**	**Related models**		
		1 to 65535	**100**	**1P**	**Effective immediately**	**P**		

1P to 65535P

F04.62	**Positioning completion output setting**	**Setting range**	**factory value**	**unit**	**Mode of entry into force**	**Related models**

		0 to 5	**0**	**--**	**Effective immediately**	**P**		

0: Absolute value of position deviation is less than the positioning completion range

1: The absolute value of position deviation is less than the positioning completion range and the position command is 0

2:The absolute value of position deviation is less than the positioning completion range and the filtered position command is 0

3:When condition 0 and the zero speed signal is valid at the same time

4:When condition 1 and the zero speed signal is valid at the same time

5:Condition 2, when the zero speed signal is valid at the same time

F04.63	**Positioning completion hold time**	**Setting range**	**factory value**	**unit**	**Mode of entry into force**	**Related models**		
		0 ~ 65535	**0**	**1ms**	**Effective immediately**	**P**		

0 to 65535ms (0 - Positioning completion signal is output as long as the condition is met)

F04.64	**Positioning proximity range**	**Setting range**	**factory value**	**unit**	**Mode of entry into force**	**Related models**		
		1 to 65535	**65535**	**1P**	**Effective immediately**	**P**		

1P to 65535P

F04.65	**Interrupt positioning completion hold time**	**Setting range**	**factory value**	**unit**	**Mode of entry into force**	**Related models**		
		0 ~ 65535	**0**	**1ms**	**Effective immediately**	**P**		

0 to 65535ms (0 - Positioning completion signal is output as long as the condition is met)

F04.66	**Interrupt positioning**	**Setting range**	**factory**	**unit**	**Mode of**	**Related**

	displacement amount (32 bits)		value		entry into force	models		
		-1073741824 ~ 1073741824	10000	--	Effective immediately	P		

-1073741824 ~ 1073741824

F04.68	Maximum speed of interrupt positioning	Setting range	factory value	unit	Mode of entry into force	Related models		
		1 to 6000	100	--	Effective immediately	P		

1 to 6000 rpm

F04.70	Interrupted positioning acceleration time	Setting range	factory value	unit	Mode of entry into force	Related models		
		0 to 300	20	1ms	Effective immediately	P		

0 - 1000ms

F04.71	Interrupt positioning deceleration time	Setting range	factory value	unit	Mode of entry into force	Related models		
		0 to 300	20	1ms	Effective immediately	P		

0 - 1000ms

F04.72	Modal lower limit (32 bits)	Setting range	factory value	unit	Mode of entry into force	Related models		
		0 to 2147483647	0	--	Power	P		

					up again.			

F04.74	**Modal upper limit (32 bits)**	**Setting range**	**factory value**	**unit**	**Mode of entry into force**	**Related models**		
		0 to 2147483647	**0**	**--**	**Downtime in effect**			

Group F05 Speed-torque control

F05.00	**Speed command source**	**Setting range**	**factory value**	**unit**	**Mode of entry into force**	**Related models**		
		0 to 6	**0**	**--**	**Downtime in effect**		**S**	

0: Digital given (F05.01)
1:Vref (default AI1)
2:Multi-segment command 1 to 16 switching
3:Vref and multi-segment command 2 to 16 switching
4:Communication given
5:Vref+numeric setting
6: Multi-segment command 1 to 16 switching + digital setting

F05.01	**Speed command setpoint**	**Setting range**	**factory value**	**unit**	**Mode of entry into force**	**Related models**		
		-9000 to 9000	**300**	**1rpm**	**Effective immediately**		**S**	

-9000rpm ~ 9000rpm

F05.02	**Tap speed setting value**	**Setting range**	**factory value**	**unit**	**Mode of entry into force**	**Related models**		
		0 to 3000	**300**	**1rpm**	**Effective immediately**		**S**	

0rpm ~ 3000rpm

F05.06	**Source of torque limitation**	**Setting range**	**factory**	**unit**	**Mode of**	**Related**

			value		entry into force	models		
		0 to 3	0	--	Effective immediately	P	S	

0:Forward and reverse internal torque limit (default)

1: Forward and reverse external torque limiting (selected using P_CL, N_CL)

2:TLMTP as forward and reverse torque limiting

3:TLMTP, TLMTN positive and negative limits

F05.07	**Internal torque limitation in forward rotation**	**Setting range**	**factory value**	**unit**	**Mode of entry into force**	**Related models**		
		0 to 5000	**3000**	**0.1%**	**Effective immediately**	**P**	**S**	

0.0% ~ 500.0% (based on rated motor torque)

F05.08	**Reverse internal torque limiting**	**Setting range**	**factory value**	**unit**	**Mode of entry into force**	**Related models**		
		0 to 5000	**3000**	**0.1%**	**Effective immediately**	**P**	**S**	

0.0% ~ 500.0% (based on rated motor torque)

F05.09	**External torque limiting on the forward side**	**Setting range**	**factory value**	**unit**	**Mode of entry into force**	**Related models**		
		0 to 5000	**3000**	**0.1%**	**Effective immediately**	**P**	**S**	

0.0% ~ 500.0% (based on rated motor torque)

F05.10	**External torque limiting on the reverse side**	**Setting range**	**factory value**	**unit**	**Mode of entry**	**Related models**

					into force			
		0 to 5000	3000	0.1%	Effective immediately	P	S	

0.0% ~ 500.0% (based on rated motor torque)

F05.12	Acceleration time 1	Setting range	factory value	unit	Mode of entry into force	Related models		
		0 ~ 65535	10	1ms	Effective immediately		S	T

0ms ~ 65535ms/1000rpm

F05.13	Deceleration time 1	Setting range	factory value	unit	Mode of entry into force	Related models		
		0 ~ 65535	10	1ms	Effective immediately		S	T

0ms ~ 65535ms/1000rpm

F05.14	Acceleration time 2	Setting range	factory value	unit	Mode of entry into force	Related models		
		0 ~ 65535	0	1ms	Effective immediately		S	T

0ms ~ 65535ms/1000rpm

F05.15	Deceleration time 2	Setting range	factory value	unit	Mode of entry into force	Related models		
		0 ~ 65535	0	1ms	Effective immedia		S	T

					tely			

0ms ~ 65535ms/1000rpm

F05.16	Acceleration time 3	Setting range	factory value	unit	Mode of entry into force	Related models		
		0 ~ 65535	0	1ms	Effective immediately		S	T

0ms ~ 65535ms/1000rpm

F05.17	Deceleration time 3	Setting range	factory value	unit	Mode of entry into force	Related models		
		0 ~ 65535	0	1ms	Effective immediately		S	T

0ms ~ 65535ms/1000rpm

F05.18	Accelerated time 4	Setting range	factory value	unit	Mode of entry into force	Related models		
		0 ~ 65535	0	1ms	Effective immediately		S	T

0ms ~ 65535ms/1000rpm

F05.19	Deceleration time 4	Setting range	factory value	unit	Mode of entry into force	Related models		
		0 ~ 65535	0	1ms	Effective immediately		S	T

0ms ~ 65535ms/1000rpm

F05.21	Zero speed clamp function	Setting range	factory value	unit	Mode of entry into force	Related models		
		0 to 2	0	--	Effective immediately		S	T

0:Invalid

1:Speed command forced to 0 when ZERO_SPD is active

2:When ZERO_SPD is valid, the speed command is forced to 0. When the actual speed of the motor is lower than F05.22, it switches to position control and locks at the current position

F05.22	Zero Speed Clamping Threshold	Setting range	factory value	unit	Mode of entry into force	Related models		
		0 to 1000	10	1rpm	Effective immediately		S	T

0rpm ~ 1000rpm

F05.23	Fast deceleration time	Setting range	factory value	unit	Mode of entry into force	Related models		
		0 to 9999	5	1ms	Downtime in effect	P	S	T

0ms ~ 9999ms

F05.24	Torque command source	Setting range	factory value	unit	Mode of entry into force	Related models		
		0 to 4	0	--	Downtime in effect			T

0: Number given (F05.27)

1:Tref

2:Digital setting, Tref switching (CMD_SEL)

3:Communication given

4:Tref+Number setting

F05.27	Torque command keypad setpoint	Setting range	factory value	unit	Mode of entry into force	Related models		
		-3000 to 3000	0	0.1%	Effective immedia tely			T

-300.0% to 300.0% (based on rated motor torque)

F05.28	Speed limit source selection for torque control	Setting range	factory value	unit	Mode of entry into force	Related models		
		0 ~ 1	0	--	Effective immedia tely			T

0: Forward and reverse internal speed limit F05.29, F05.30
1:VLMT

F05.29	Internal positive speed limit	Setting range	factory value	unit	Mode of entry into force	Related models		
		0 to 9000	3000	--	Effective immedia tely			T

0rpm ~ 9000rpm

F05.30	Internal negative speed limit	Setting range	factory value	unit	Mode of entry into force	Related models		
		0 to 9000	3000	--	Effective immedia tely			T

0rpm ~ 9000rpm

F05.31	Hard limit torque limiting	Setting range	factory value	unit	Mode of entry into force	Related models		
		0 to 4000	3000	0.1%	Effective immediately	P	S	T

Torque limit value when hard limit is touched, -300.0% to 300.0% (based on motor rated torque)

F05.32	Hard limit torque limit detection time	Setting range	factory value	unit	Mode of entry into force	Related models		
		0 to 2000	100	--	Effective immediately	P	S	T

Torque limit detection time when a hard limit is touched, 0ms to 2000ms

F05.33	Speed command serial number selection method	Setting range	factory value	unit	Mode of entry into force	Related models		
		0 ~ 1	0	--	Downtime in effect		S	

0:DI terminal selection

1: Communication options

F05.34	Paragraph 1 speed	Setting range	factory value	unit	Mode of entry into force	Related models		
		-9000 to 9000	0	1rpm	Effective immediately		S	

-9000rpm ~ 9000rpm

F05.35	Paragraph 1 acceleration and deceleration options	Setting range	factory value	unit	Mode of entry into	Related models

					force			
		0 to 3	**0**	**--**	**Effective immediately**		**S**	

0 to 3 (0: 1st acceleration/deceleration)

F05.36	**Paragraph 2 speed**	**Setting range**	**factory value**	**unit**	**Mode of entry into force**	**Related models**		
		-9000 to 9000	**0**	**1rpm**	**Effective immediately**		**S**	

-9000rpm ~ 9000rpm

F05.37	**Paragraph 2 acceleration and deceleration options**	**Setting range**	**factory value**	**unit**	**Mode of entry into force**	**Related models**		
		0 to 3	**0**	**--**	**Effective immediately**		**S**	

0 to 3 (0: 1st acceleration/deceleration)

F05.38	**Paragraph 3 speed**	**Setting range**	**factory value**	**unit**	**Mode of entry into force**	**Related models**		
		-9000 to 9000	**0**	**1rpm**	**Effective immediately**		**S**	

-9000rpm ~ 9000rpm

F05.39	**Paragraph 3 acceleration and deceleration options**	**Setting range**	**factory value**	**unit**	**Mode of entry into force**	**Related models**		
		0 to 3	**0**	**--**	**Effective immediately**		**S**	

0 to 3 (0: 1st acceleration/deceleration)

F05.40	Paragraph 4 speed	Setting range	factory value	unit	Mode of entry into force	Related models		
		-9000 to 9000	0	1rpm	Effective immediately		S	

-9000rpm ~ 9000rpm

F05.41	Paragraph 4 acceleration and deceleration options	Setting range	factory value	unit	Mode of entry into force	Related models		
		0 to 3	0	--	Effective immediately		S	

0 to 3 (0: 1st acceleration/deceleration)

F05.42	Paragraph 5 speed	Setting range	factory value	unit	Mode of entry into force	Related models		
		-9000 to 9000	0	1rpm	Effective immediately		S	

-9000rpm ~ 9000rpm

F05.43	Paragraph 5 acceleration and deceleration options	Setting range	factory value	unit	Mode of entry into force	Related models		
		0 to 3	0	--	Effective immediately		S	

0 to 3 (0: 1st acceleration/deceleration)

F05.44	Paragraph 6 speed	Setting range	factory	unit	Mode of	Related

			value		entry into force	models		
		-9000 to 9000	0	1rpm	Effective immediately		S	

-9000rpm ~ 9000rpm

F05.45	Paragraph 6 acceleration and deceleration options	Setting range	factory value	unit	Mode of entry into force	Related models		
		0 to 3	0	--	Effective immediately		S	

0 to 3 (0: 1st acceleration/deceleration)

F05.46	Paragraph 7 speed	Setting range	factory value	unit	Mode of entry into force	Related models		
		-9000 to 9000	0	1rpm	Effective immediately		S	

-9000rpm ~ 9000rpm

F05.47	Paragraph 7 acceleration and deceleration options	Setting range	factory value	unit	Mode of entry into force	Related models		
		0 to 3	0	--	Effective immediately		S	

0 to 3 (0: 1st acceleration/deceleration)

F05.48	Paragraph 8 speed	Setting range	factory value	unit	Mode of entry into force	Related models		
		-9000 to 9000	0	1rpm	Effective		S	

					immedia tely			

-9000rpm ~ 9000rpm

F05.49	**Paragraph 8 acceleration and deceleration options**	**Setting range**	**factory value**	**unit**	**Mode of entry into force**	**Related models**		
		0 to 3	**0**	**--**	**Effective immedia tely**		**S**	

0 to 3 (0: 1st acceleration/deceleration)

F05.50	**Paragraph 9 speed**	**Setting range**	**factory value**	**unit**	**Mode of entry into force**	**Related models**		
		-9000 to 9000	**0**	**1rpm**	**Effective immedia tely**		**S**	

-9000rpm ~ 9000rpm

F05.51	**Paragraph 9 acceleration and deceleration options**	**Setting range**	**factory value**	**unit**	**Mode of entry into force**	**Related models**		
		0 to 3	**0**	**--**	**Effective immedia tely**		**S**	

0 to 3 (0: 1st acceleration/deceleration)

F05.52	**Paragraph 10 speed**	**Setting range**	**factory value**	**unit**	**Mode of entry into force**	**Related models**		
		-9000 to 9000	**0**	**1rpm**	**Effective immedia tely**		**S**	

-9000rpm ~ 9000rpm

F05.53	Paragraph 10 acceleration and deceleration options	Setting range	factory value	unit	Mode of entry into force	Related models		
		0 to 3	0	--	Effective immediately		S	

0 to 3 (0: 1st acceleration/deceleration)

F05.54	Paragraph 11 speed	Setting range	factory value	unit	Mode of entry into force	Related models		
		-9000 to 9000	0	1rpm	Effective immediately		S	

-9000rpm ~ 9000rpm

F05.55	Paragraph 11 acceleration and deceleration options	Setting range	factory value	unit	Mode of entry into force	Related models		
		0 to 3	0	--	Effective immediately		S	

0 to 3 (0: 1st acceleration/deceleration)

F05.56	Paragraph 12 speed	Setting range	factory value	unit	Mode of entry into force	Related models		
		-9000 to 9000	0	1rpm	Effective immediately		S	

-9000rpm ~ 9000rpm

F05.57	Paragraph 12 acceleration and deceleration options	Setting range	factory value	unit	Mode of entry into	Related models

					force	
		0 to 3	0	--	Effective immediately	S

0 to 3 (0: 1st acceleration/deceleration)

F05.58	Paragraph 13 speed	Setting range	factory value	unit	Mode of entry into force	Related models
		-9000 to 9000	0	1rpm	Effective immediately	S

-9000rpm ~ 9000rpm

F05.59	Paragraph 13 acceleration and deceleration options	Setting range	factory value	unit	Mode of entry into force	Related models
		0 to 3	0	--	Effective immediately	S

0 to 3 (0: 1st acceleration/deceleration)

F05.60	Paragraph 14 speed	Setting range	factory value	unit	Mode of entry into force	Related models
		-9000 to 9000	0	1rpm	Effective immediately	S

-9000rpm ~ 9000rpm

F05.61	Paragraph 14 acceleration and deceleration options	Setting range	factory value	unit	Mode of entry into force	Related models
		0 to 3	0	--	Effective immediately	S

0 to 3 (0: 1st acceleration/deceleration)

F05.62	Paragraph 15 speed	Setting range	factory value	unit	Mode of entry into force	Related models		
		-9000 to 9000	0	1rpm	Effective immediately		S	

-9000rpm ~ 9000rpm

F05.63	Paragraph 15 acceleration and deceleration options	Setting range	factory value	unit	Mode of entry into force	Related models		
		0 to 3	0	--	Effective immediately		S	

0 to 3 (0: 1st acceleration/deceleration)

F05.64	Paragraph 16 speed	Setting range	factory value	unit	Mode of entry into force	Related models		
		-9000 to 9000	0	1rpm	Effective immediately		S	

-9000rpm ~ 9000rpm

F05.65	Paragraph 16 acceleration and deceleration options	Setting range	factory value	unit	Mode of entry into force	Related models		
		0 to 3	0	--	Effective immediately		S	

0 to 3 (0: 1st acceleration/deceleration)

F05.70	Speed-consistent signal	Setting range	factory	unit	Mode of	Related

	width		value		entry into force	models		
		10 to 1000	50	1rpm	Effective immediately		S	

10rpm ~ 1000rpm

F05.71	Speed reaches specified value	Setting range	factory value	unit	Mode of entry into force	Related models		
		10 to 9000	100	1rpm	Effective immediately	P	S	T

10rpm to 9000rpm

F05.73	Motor rotation signal speed threshold	Setting range	factory value	unit	Mode of entry into force	Related models		
		0 to 1000	20	1rpm	Effective immediately	P	S	T

0rpm ~ 1000rpm

F05.74	Zero Speed Signal Output Threshold	Setting range	factory value	unit	Mode of entry into force	Related models		
		0 to 1000	60	1rpm	Effective immediately	P	S	T

0 to 1000rpm, after the actual speed falls below this threshold, DO function 6 is effective

F05.75	Torque reaches specified value	Setting range	factory value	unit	Mode of entry into force	Related models		
		0 to 3000	1000	0.1%	Effective	P	S	T

					immediately			

0.0% ~ 300.0% (based on rated motor torque)

F05.76	**Torque arrival detection width**	**Setting range**	**factory value**	**unit**	**Mode of entry into force**	**Related models**		
		0 to 3000	**200**	**0.1%**	**Effective immediately**	**P**	**S**	**T**

0.0% ~ 300.0% (based on rated motor torque)

Group F06 Digital Inputs and Outputs

F06.00	Number of active DI terminals	Setting range	factory value	unit	Mode of entry into force	Related models		
		0 ~ 65535	5	--	Display only	P	S	T

0 ~ 65535

F06.01	DI1 terminal function selection	Setting range	factory value	unit	Mode of entry into force	Related models		
		0 to 63	1	--	Downtime in effect	P	S	T

Input function code: 0 to 63

0:No definition

1 to 63: Reference digital input (DI) function definition table

F06.02	DI2 terminal function selection	Setting range	factory value	unit	Mode of entry into force	Related models		
		0 to 63	2	--	Downtime in effect	P	S	T

Input function code: 0 to 63

0:No definition

1 to 63: Reference digital input (DI) function definition table

F06.03	DI3 terminal function selection	Setting range	factory value	unit	Mode of entry into force	Related models

		0 to 63	**0**	**--**	**Downtime in effect**	**P**	**S**	**T**

Input function code: 0 to 63

0:No definition

1 to 63: Reference digital input (DI) function definition table

F06.04	**DI4 terminal function selection**	**Setting range**	**factory value**	**unit**	**Mode of entry into force**	**Related models**		
		0 to 63	**15**	**--**	**Downtime in effect**	**P**	**S**	**T**

Input function code: 0 to 63

0:No definition

1 to 63: Reference digital input (DI) function definition table

F06.05	**DI5 terminal function selection**	**Setting range**	**factory value**	**unit**	**Mode of entry into force**	**Related models**		
		0 to 63	**16**	**--**	**Downtime in effect**	**P**	**S**	**T**

Input function code: 0 to 63

0:No definition

1 to 63: Reference digital input (DI) function definition table

F06.11	**DI1 terminal logic selection**	**Setting range**	**factory value**	**unit**	**Mode of entry into force**	**Related models**		
		0 ~ 1	**0**	**--**	**Downtime in effect**	**P**	**S**	**T**

Input polarity setting: 0 to 1

0: active low (closed)

1: Active high (open)

F06.12	DI2 terminal logic selection	Setting range	factory value	unit	Mode of entry into force	Related models		
		0 ~ 1	0	--	Downtime in effect	P	S	T

Input polarity setting: 0 to 1
0: active low (closed)
1: Active high (open)

F06.13	DI3 terminal logic selection	Setting range	factory value	unit	Mode of entry into force	Related models		
		0 ~ 1	0	--	Downtime in effect	P	S	T

Input polarity: 0 to 1
0: active low (closed)
1: Active high (open)

F06.14	DI4 terminal logic selection	Setting range	factory value	unit	Mode of entry into force	Related models		
		0 ~ 1	0	--	Downtime in effect	P	S	T

Input polarity: 0 to 1
0: active low (closed)
1: Active high (open)

F06.15	DI5 terminal logic selection	Setting range	factory value	unit	Mode of entry into force	Related models		
		0 ~ 1	0	--	Downtime in effect	P	S	T

Input polarity setting: 0 to 1

0: active low (closed)
1: Active high (open)

F06.20	Number of effective DO terminals	Setting range	factory value	unit	Mode of entry into force	Related models		
		0 ~ 65535	2	--	Display only	P	S	T

0 ~ 65535

F06.21	DO1 terminal function selection	Setting range	factory value	unit	Mode of entry into force	Related models		
		0 to 31	0	--	Downtime in effect	P	S	T

Output function code: 1 to 31
0:No definition
1 to 31: Reference Digital Output (DO) Function Definition Table

F06.22	DO2 terminal function selection	Setting range	factory value	unit	Mode of entry into force	Related models		
		0 to 31	0	--	Downtime in effect	P	S	T

Output function code: 1 to 31
0:No definition
1 to 31: Reference Digital Output (DO) Function Definition Table

F06.26	DO6 terminal function selection	Setting range	factory value	unit	Mode of entry into force	Related models		
		0 to 31	16	--	Effective immediately	P	S	T

Output function code: 1 to 31

0:No definition

1 to 31: Reference Digital Output (DO) Function Definition Table

F06.31	DO1 terminal logic level selection	Setting range	factory value	unit	Mode of entry into force	Related models		
		0 ~ 1	0	--	Downtime in effect	P	S	T

Output polarity setting: 0 to 1

0: On when active (normally open contact)

1: Non-conducting when active (normally closed contact)

F06.32	DO2 terminal logic level selection	Setting range	factory value	unit	Mode of entry into force	Related models		
		0 ~ 1	0	--	Downtime in effect	P	S	T

Output polarity setting: 0 to 1

0: On when active (normally open contact)

1: Non-conducting when active (normally closed contact)

F06.41	FunIN1 signal unassigned state (HEX) DI1-DI15	Setting range	factory value	unit	Mode of entry into force	Related models		
		0000H to FFFFH	0	--	Power up again.	P	S	T

Setting range (hexadecimal number) 0x0 to 0xFFFF.

Bit0: Reserved

Bit1: corresponds to DI function 1.

Bit2: corresponds to DI function 2.

......

Bit15: corresponds to DI function 15

F06.42	FunIN2 signal unassigned	Setting range	factory	unit	Mode of	Related

	status (HEX) DI16-DI31		value		entry into force	models		
		0000H to FFFFH	0	--	Power up again.	P	S	T

Setting range (hexadecimal number) 0x0 to 0xFFFF.

Bit0: corresponds to DI function 16.

Bit1: corresponds to DI function 17.

......

Bit15: Corresponds to DI function 31

F06.43	FunIN3 signal unassigned state (HEX) DI32-DI47	Setting range	factory value	unit	Mode of entry into force	Related models		
		0000H to FFFFH	0	--	Power up again.	P	S	T

Setting range (hexadecimal number) 0x0 to 0xFFFF.

Bit0: Reserved

Bit1: corresponds to DI function 32.

Bit2: corresponds to DI function 33.

......

Bit15: Corresponds to DI function 47

F06.44	FunIN4 signal unassigned state (HEX) DI48-DI63	Setting range	factory value	unit	Mode of entry into force	Related models		
		0000H to FFFFH	0	--	Power up again.	P	S	T

Setting range (hexadecimal number) 0x0 to 0xFFFF.

Bit0: corresponds to DI function 48.

Bit1: corresponds to DI function 49.

......

Bit15: Corresponds to DI function 63

F06.53	Servo OFF delay time after brake action at zero speed	Setting range	factory value	unit	Mode of entry into force	Related models		
		0 to 9999	10	1ms	Effective	P	S	T

					immediately			

0ms ~ 9999ms

F06.54	**Speed setting for brake operation in operation**	**Setting range**	**factory value**	**unit**	**Mode of entry into force**	**Related models**		
		0 to 3000	**100**	**1rpm**	**Effective immediately**	**P**	**S**	**T**

0rpm ~ 3000rpm

F06.55	**Waiting time for brake action in operation**	**Setting range**	**factory value**	**unit**	**Mode of entry into force**	**Related models**		
		0 to 9999	**10**	**1ms**	**Effective immediately**	**P**	**S**	**T**

0ms ~ 9999ms

F06.56	**Dynamic Braking (DB) Function Selection**	**Setting range**	**factory value**	**unit**	**Mode of entry into force**	**Related models**		
		0 to 3	**0**	**--**	**Effective immediately**	**P**	**S**	**T**

0:Free stop process does not enable DB, free state does not enable DB

1:Free stop process enables DB, free state does not enable DB

2:Free stop process does not enable DB, free state enables DB

3:Free stop process enable DB, free state enable DB

F06.59	**Z pulse width adjustment**	**Setting range**	**factory value**	**unit**	**Mode of entry into force**	**Related models**		
		0 to 100	**0**	**--**	**Power up again.**	**P**	**S**	**T**

0 to 100

F06.61	General DI filtering options	Setting range	factory value	unit	Mode of entry into force	Related models		
		0 to 10000	500	1us	Power up again.	P	S	T

0 to 10000

F06.62	High-speed DI filtering settings	Setting range	factory value	unit	Mode of entry into force	Related models		
		0 to 10000	50	1us	Power up again.	P	S	T

0 ~ 10000us

(Available only for the following DI terminals: DI7, DI8, DI9)

Group F07 Analog Inputs and Outputs

F07.00	AI1 minimum input	Setting range	factory value	unit	Mode of entry into force	Related models		
		-1000 to 1000	-1000	0.01V	Effective immediately	P	S	T

-10.00V to 10.00V

F07.01	AI1 minimum value corresponds to the set value	Setting range	factory value	unit	Mode of entry into force	Related models		
		-1000 to 1000	-1000	0.1%	Effective immediately	P	S	T

-100.0% to 100.0%

(100% speed corresponds to the speed set in F05.14, 100% torque corresponds to the torque set in F05.15)

F07.02	AI1 maximum input	Setting range	factory value	unit	Mode of entry into force	Related models		
		-1000 to 1000	1000	0.01V	Effective immediately	P	S	T

-10.00V to 10.00V

F07.03	AI1 maximum value corresponds to the set value	Setting range	factory value	unit	Mode of entry into force	Related models		
		-1000 to 1000	1000	0.1%	Effective immedia	P	S	T

					tely			

-100.0% to 100.0%

(100% speed corresponds to the speed set in F05.14, 100% torque corresponds to the torque set in F05.15)

F07.04	AI1 Zero Point Trim	Setting range	factory value	unit	Mode of entry into force	Related models		
		-500 to 500	0	1mV	Effective immediately	P	S	T

-500mV ~ 500mV

F07.05	AI1 deadband setting	Setting range	factory value	unit	Mode of entry into force	Related models		
		0 to 200	0	0.1%	Effective immediately	P	S	T

0.0 to 20.0%

F07.06	AI1 input filtering time	Setting range	factory value	unit	Mode of entry into force	Related models		
		0 ~ 65535	20	0.1ms	Effective immediately	P	S	T

0.0ms ~ 6553.5ms

F07.07	AI1 function selection	Setting range	factory value	unit	Mode of entry into force	Related models		
		0 to 5	0	--	Effective immediately	P	S	T

0:Vref,speed command

1:Tref, torque command

2:VLMT, speed limit
3:TLMTP, positive torque limiting
4:TLMTN, torque negative limit
5:TFFD, Torque Feed Forward

F07.10	AI2 minimum input	Setting range	factory value	unit	Mode of entry into force	Related models		
		-1000 to 1000	-1000	0.01V	Effective immediately	P	S	T

-10.00V to 10.00V

F07.11	AI2 minimum value corresponds to the set value	Setting range	factory value	unit	Mode of entry into force	Related models		
		-1000 to 1000	-1000	0.1%	Effective immediately	P	S	T

-100.0% to 100.0%
(100% speed corresponds to the speed set in F05.14, 100% torque corresponds to the torque set in F05.15)

F07.12	AI2 maximum input	Setting range	factory value	unit	Mode of entry into force	Related models		
		-1000 to 1000	1000	0.01V	Effective immediately	P	S	T

-10.00V to 10.00V

F07.13	AI2 maximum value corresponds to the set value	Setting range	factory value	unit	Mode of entry into force	Related models		
		-1000 to 1000	1000	0.1%	Effective immediately	P	S	T

-100.0% to 100.0%

(100% speed corresponds to the speed set in F05.14, 100% torque corresponds to the torque set in F05.15)

F07.14	**AI2 Zero Point Trim**	**Setting range**	**factory value**	**unit**	**Mode of entry into force**	**Related models**		
		-500 to 500	**0**	**1mV**	**Effective immediately**	**P**	**S**	**T**

-500mV ~ 500mV

F07.15	**AI2 deadband setting**	**Setting range**	**factory value**	**unit**	**Mode of entry into force**	**Related models**		
		0 to 200	**0**	**0.1%**	**Effective immediately**	**P**	**S**	**T**

0.0 to 20.0%

F07.16	**AI2 input filtering time**	**Setting range**	**factory value**	**unit**	**Mode of entry into force**	**Related models**		
		0 ~ 65535	**20**	**0.1ms**	**Effective immediately**	**P**	**S**	**T**

0.0ms ~ 6553.5ms

F07.17	**AI2 Function Selection**	**Setting range**	**factory value**	**unit**	**Mode of entry into force**	**Related models**		
		0 to 5	**3**	**--**	**Effective immediately**	**P**	**S**	**T**

0:Vref,speed command

1:Tref, torque command

2:VLMT, speed limit

3:TLMTP, positive torque limiting
4:TLMTN, torque negative limit
5:TFFD, Torque Feed Forward

F07.20	AI set 100% speed	Setting range	factory value	unit	Mode of entry into force	Related models		
		0 to 9000	3000	1rpm	Effective immediately	P	S	T

0 to 9000rpm

F07.21	AI sets 100% torque	Setting range	factory value	unit	Mode of entry into force	Related models		
		0 to 500	100	0.01	Effective immediately	P	S	T

0 ~ 5.00 times the rated torque of the motor

F07.30	AO1 signal selection (non-standard support)	Setting range	factory value	unit	Mode of entry into force	Related models		
		0 to 13	0	--	Effective immediately	P	S	T

0:Motor speed (1V/1000rpm) default
1:Speed command (1V/1000rpm)
2: Torque command (1V/100%)
3: Position deviation (0.05V/1 command unit)
4: Position amplifier deviation (after electronic gearing) (0.05V/encoder unit)
5: Position command speed (1V/1000 rpm)
6:Positioning completion command (completed:5V, incomplete:0V)
7: Speed feedforward (1V/1000rpm)
8: Torque feedforward (1V/100%)
9: Load factor (1V/100%)
10: Regenerative load factor (1V/100%)
11:Driver temperature (0.1V/1°C)

12:AI1 (1V/1V)
13:AI2 (1V/1V)

F07.31	AO1 bias quantity voltage	Setting range	factory value	unit	Mode of entry into force	Related models		
		-10000 to 10000	0	1mV	Effective immediately	P	S	T

10000mV ~ 10000mV

F07.32	AO1 multiplier	Setting range	factory value	unit	Mode of entry into force	Related models		
		-9999 to 9999	100	0.01	Effective immediately	P	S	T

-99.99 to 99.99

F07.33	AO1 output data setting	Setting range	factory value	unit	Mode of entry into force	Related models		
		0 ~ 1	0	--	Effective immediately	P	S	T

0: Signed data output, -10V to +10V.
1: Absolute value data output, 0 to 10V

F07.34	AO2 signal selection (non-standard support)	Setting range	factory value	unit	Mode of entry into force	Related models		
		0 to 13	0	--	Effective immediately	P	S	T

0:Motor speed (1V/1000rpm) default
1:Speed command (1V/1000rpm)

2: Torque command (1V/100%)
3: Position deviation (0.05V/1 command unit)
4: Position amplifier deviation (after electronic gearing) (0.05V/encoder unit)
5: Position command speed (1V/1000 rpm)
6:Positioning completion command (completed:5V, incomplete:0V)
7: Speed feedforward (1V/1000rpm)
8: Torque feedforward (1V/100%)
9: Load factor (1V/100%)
10: Regenerative load factor (1V/100%)
11:Driver temperature (0.1V/1°C)
12:AI1 (1V/1V)
13:AI2 (1V/1V)

F07.35	AO2 bias volume voltage	Setting range	factory value	unit	Mode of entry into force	Related models		
		-10000 to 10000	0	1mV	Effective immediately	P	S	T

-10000mV ~ 10000mV

F07.36	AO2 multiplier	Setting range	factory value	unit	Mode of entry into force	Related models		
		-9999 to 9999	100	0.01	Effective immediately	P	S	T

-99.99 to 99.99

F07.37	AO2 output data setting	Setting range	factory value	unit	Mode of entry into force	Related models		
		0 ~ 1	0	--	Effective immediately	P	S	T

0: Signed data output, -10V to +10V.
1: Absolute value data output, 0 to 10V

Group F08 Fault Protection Group

F08.00	Momentary stop non-stop protection switch	Setting range	factory value	unit	Mode of entry into force	Related models		
		0 ~ 1	0	--	Effective immediately	P	S	T

0:Not on

1:Open

F08.01	Instant stop non-stop deceleration time	Setting range	factory value	unit	Mode of entry into force	Related models		
		0 to 10000	20	1ms	Effective immediately	P	S	T

0ms ~ 10000ms/1000rpm

F08.02	Servo OFF stop method	Setting range	factory value	unit	Mode of entry into force	Related models		
		0 to 2	0	--	Downtime in effect	P	S	T

0:Free run stop, stay free

1:Zero speed stop, stay free

2:Stop with emergency stop torque, keep free

F08.03	No.2 Fault Stop Method Selection	Setting range	factory value	unit	Mode of entry into force	Related models

		0 to 2	**0**	**--**	**Downtime in effect**	**P**	**S**	**T**

0:Free to stop and stay free

1:Zero speed stop, stay free

2:Stop with emergency stop torque, keep free

F08.04	**Overtravel input setting**	**Setting range**	**factory value**	**unit**	**Mode of entry into force**	**Related models**		
		0 ~ 1	**1**	**--**	**Downtime in effect**	**P**	**S**	**T**

0:P_OT positive drive disable, N_OT negative drive disable

1:Invalid

F08.05	**Stopping method in case of overtravel**	**Setting range**	**factory value**	**unit**	**Mode of entry into force**	**Related models**		
		0 to 2	**0**	**--**	**Downtime in effect**	**P**	**S**	**T**

0:Free run stop, stay free

1:Zero speed run stop, keep free

2:Stop with emergency stop torque, keep free

F08.06	**Power input out-of-phase protection selection**	**Setting range**	**factory value**	**unit**	**Mode of entry into force**	**Related models**		
		0 ~ 1	**0**	**--**	**Effective immediately**	**P**	**S**	**T**

0:Enables protection

1: Prohibition of protection

F08.07	**Power output out-of-phase protection options**	**Setting range**	**factory value**	**unit**	**Mode of entry**	**Related models**

					into force			
		0 ~ 1	0	--	Effective immediately	P	S	T

0:Enables protection

1: Prohibition of protection

F08.08	Emergency stop torque	Setting range	factory value	unit	Mode of entry into force	Related models		
		0 to 5000	3000	0.1%	Effective immediately	P	S	T

0.0% ~ 300.0% (based on rated motor torque)

F08.09	Flying car protection function	Setting range	factory value	unit	Mode of entry into force	Related models		
		0 ~ 1	0	--	Effective immediately	P	S	T

0:Turn off protection

1:Turn on protection

F08.10	Overload warning value	Setting range	factory value	unit	Mode of entry into force	Related models		
		1 to 100	100	1%	Effective immediately	P	S	T

1% to 100%

F08.11	Motor overload protection factor	Setting range	factory value	unit	Mode of entry into force	Related models

		10 to 300	**100**	**1%**	**Effective immediately**	**P**	**S**	**T**

10% to 300%

F08.12	**Undervoltage protection point**	**Setting range**	**factory value**	**unit**	**Mode of entry into force**	**Related models**		
		50 to 130	**100**	**1%**	**Effective immediately**	**P**	**S**	**T**

50% to 100% (100% corresponds to the default undervoltage point)

F08.13	**Overspeed fault point**	**Setting range**	**factory value**	**unit**	**Mode of entry into force**	**Related models**		
		50 to 120	**120**	**1%**	**Effective immediately**	**P**	**S**	**T**

50% to 120% (100% corresponds to the maximum motor speed)

F08.14	**Maximum pulse input frequency**	**Setting range**	**factory value**	**unit**	**Mode of entry into force**	**Related models**		
		10 to 9000	**500**	**1KHZ**	**Downtime in effect**	**P**		

10 to 9000K

F08.15	**Short circuit to ground detection protection options**	**Setting range**	**factory value**	**unit**	**Mode of entry into force**	**Related models**		
		0 ~ 1	**0**	**--**	**Effective immediately**	**P**	**S**	**T**

0:Detection enable (default)

1:Prohibition of detection

<table>
<tr><td rowspan="2">F08.16</td><td rowspan="2">Bus-type encoder interference detection delay</td><td>Setting range</td><td>factory value</td><td>unit</td><td>Mode of entry into force</td><td colspan="3">Related models</td></tr>
<tr><td>0 to 99</td><td>0</td><td>--</td><td>Effective immediately</td><td>P</td><td>S</td><td>T</td></tr>
</table>

0 to 99

<table>
<tr><td rowspan="2">F08.17</td><td rowspan="2">Pulse input filter setting</td><td>Setting range</td><td>factory value</td><td>unit</td><td>Mode of entry into force</td><td colspan="3">Related models</td></tr>
<tr><td>0 to 500</td><td>40</td><td>--</td><td>Power up again.</td><td>P</td><td></td><td></td></tr>
</table>

0 to 500 (in 10ns)

Below 250KHZ, the recommended value is 40; 250K ~ 500K, the recommended value is 20; 500K ~ 1M, the recommended value is 10;

1M or more recommended value 5;

Above 2M set to 0.

<table>
<tr><td rowspan="2">F08.18</td><td rowspan="2">High-speed pulse input filtering</td><td>Setting range</td><td>factory value</td><td>unit</td><td>Mode of entry into force</td><td colspan="3">Related models</td></tr>
<tr><td>0 to 500</td><td>40</td><td>--</td><td>Power up again.</td><td>P</td><td>S</td><td>T</td></tr>
</table>

0 to 500 (in 10ns)

Below 250KHZ, recommended value 40; 250K to 500K, recommended value 20; 500K to 1M, recommended value 10.

Recommended value of 5 over 1M.

Set to 0 above 2M.

<table>
<tr><td rowspan="2">F08.22</td><td rowspan="2">Excessive speed deviation threshold</td><td>Setting range</td><td>factory value</td><td>unit</td><td>Mode of entry into force</td><td colspan="3">Related models</td></tr>
<tr><td>0 to 10000</td><td>0</td><td>1rpm</td><td>Effective</td><td>P</td><td>S</td><td></td></tr>
</table>

					immedia tely			

0 ~ 10000rpm

F08.23	Torque saturation timeout duration	Setting range	factory value	unit	Mode of entry into force	Related models		
		0 to 30,000	0	1ms	Effective immedia tely	P	S	T

0 ~ 30000ms

F08.24	Absolute system settings	Setting range	factory value	unit	Mode of entry into force	Related models		
		0 to 3	0	--	Power up again.	P	S	T

0:Incremental system

1:Absolute value system

2: Absolute system (E14 fault needs to be cleared manually)

3:- Absolute value system and overflow error reported

F08.26	Stopping method for emergency stop (quick stop)	Setting range	factory value	unit	Mode of entry into force	Related models		
		0 to 7	1	--	Downtim e in effect			

0 to 7

F08.27	Stopping method of suspension	Setting range	factory value	unit	Mode of entry into force	Related models		
		0 ~ 1	1	--	Downtim e in effect			

0 ~ 1

F08.28	Software Overcurrent Options	Setting range	factory value	unit	Mode of entry into force	Related models		
		0 ~ 1	0	--	Power up again.	P	S	T

0:Not prohibited

1:Disable

F08.29	Not ready to handle when servo enabled	Setting range	factory value	unit	Mode of entry into force	Related models		
		0 to 2	0	--	Effective immedia tely	P	S	T

0: No faults or warnings are reported.

1: Report warning AL.085.

2:Error Er.030 reported.

F08.30	Mains power failure (E.46) detection setting	Setting range	factory value	unit	Mode of entry into force	Related models		
		0 to 2	0	--	Effective immedia tely	P	S	T

0: Fault E.46 is detected and can be reset automatically

1:No fault detection E.46

2:Fault E.46 detected but not automatically reset

F08.31	Undervoltage (E.23) detection option	Setting range	factory value	unit	Mode of entry into force	Related models		
		0 to 2	0	--	Effective immedia tely	P	S	T

0: Fault E.23 is detected and can be reset automatically
1: No fault detection E.23
2: Fault E.23 detected but not automatically reset

F08.32	Undervoltage (E.23) and mains power failure (E.46) storage options	Setting range	factory value	unit	Mode of entry into force	Related models		
		0 ~ 1	0	--	Effective immediately	P	S	T

0:means no storage
1:indicates storage

F08.34	Soft limit detection setting	Setting range	factory value	unit	Mode of entry into force	Related models		
		0 to 2	0	--	Effective immediately	P	S	T

0: no detection of soft limits.
1: Start detecting soft limits upon power-up.
2:The soft limit is detected only after the return to the home position is completed.

F08.35	Positive soft limit (32 bits)	Setting range	factory value	unit	Mode of entry into force	Related models		
		-2147483648 to 2147483647	2147483647	--	Downtime in effect	P	S	T

Positive soft limit, active in all control modes.

F08.37	Negative soft limit (32 bits)	Setting range	factory value	unit	Mode of entry into force	Related models		
		-2147483648 to 2147483647	-21474836	--	Downtime in	P	S	T

			48		effect			

Negative soft limit, active in all control modes.

F08.39	Fault reset timing	Setting range	factory value	unit	Mode of entry into force	Related models		
		0 ~ 1	0	--	Effective immediately	P	S	T

0:SON can be reset when valid

1:Non-resettable when SON is active

F08.40	Power failure prompt storage function	Setting range	factory value	unit	Mode of entry into force	Related models		
		0 ~ 1	0	--	Effective immediately	P	S	T

0:Not on

1:Open

F08.41	Abnormality detection switch	Setting range	factory value	unit	Mode of entry into force	Related models		
		0 ~ 1	0	--	Power up again.	P	S	T

0:Not on

1:Open

F08.42	Pause detection method	Setting range	factory value	unit	Mode of entry into force	Related models		
		0 ~ 1	0	--	Effective immediately			

F08.43	Contour position pre-start deviation check	Setting range	factory value	unit	Mode of entry into force	Related models		
		0 ~ 1	0	--	Effective immediately			

F08.44	转矩保护值	Setting range	factory value	Unit	Mode of entry into force	Related models		
		0 ~ 1	0	--	Power on again	P	S	T

0.0%~300.0%(Based on motor rated torque）

F08.45	Torque protection fault time	Setting range	factory value	Unit	Mode of entry into force	Related models		
		0 ~ 1	0	--	Power on again	P	S	T

0~60000ms

0- Not valid, non-zero value - When the torque feedback reaches the torque protection value and the time reaches the set value, the fault E.72 will be triggered

Group F09 Communication control setting

F09.00	Servo axis address number	Setting range	factory value	unit	Mode of entry into force	Related models		
		1 - 247	1	--	Effective immediately	P	S	T

1 to 247, 0 is the broadcast address. Used for communication, supports Modbus, CANOpen, etc. (A)

F09.01	Modbus baud rate	Setting range	factory value	unit	Mode of entry into force	Related models		
		0 to 6	2	--	Effective immediately	P	S	T

0:2400(A)
1:4800(A)
2:9600(A)
3:19200(A)
4:38400(A)
5:57600(A)
6:115200(A)

F09.02	Modbus data format	Setting range	factory value	unit	Mode of entry into force	Related models		
		0 to 3	0	--	Effective immediately	P	S	T

0:No checksum, 2 stop bits(A)
1:Even parity, 1 stop bit(A)
2:Odd parity, 1 stop bit(A)
3:No checksum, 1 stop bit(A)

F09.03	Communication timeout	Setting range	factory value	unit	Mode of entry into force	Related models		
		0 to 9999	0	1ms	Effective immediately	P	S	T

Monitor the communication bus for data within the set time(A)

F09.04	Communication response time delay	Setting range	factory value	unit	Mode of entry into force	Related models		
		0 to 9999	0	1ms	Effective immediately	P	S	T

Receive data and then delay for a set time before answering(A)

F09.05	Communication control DI enable setting 1	Setting range	factory value	unit	Mode of entry into force	Related models		
		0000H to FFFFH	0	--	Downtime in effect	P	S	T

This parameter is displayed in hexadecimal form on the panel, where each binary bit represents a DI function, BIT0 is reserved, BIT1 to BIT15 correspond to DI functions 1 to 15 respectively. the value of the binary bit indicates whether the corresponding DI function is enabled for communication control:

0: not enabled. (A)

1:Enable(A)

F09.06	Communication control DI enable setting 2	Setting range	factory value	unit	Mode of entry into force	Related models		
		0000H to FFFFH	0	--	Downtime in effect	P	S	T

This parameter is displayed in hexadecimal form on the panel, where each binary bit represents a DI function, BIT0 to BIT15 correspond to DI functions 16 to 31 respectively. the value of the binary bit indicates whether the corresponding DI function is enabled for communication control:

0: not enabled. (A)

1:Enable(A)

F09.07	Communication control DI enable setting 3	Setting range	factory value	unit	Mode of entry into force	Related models		
		0000H to FFFFH	0	--	Downtime in effect	P	S	T

This parameter is displayed in hexadecimal form on the panel, where each binary bit represents a DI function, BIT0 to BIT15 correspond to DI functions 32 to 47 respectively. the value of the binary bit indicates whether the corresponding DI function is enabled for communication control:

0: not enabled. (A)

1:Enable(A)

F09.08	Communication control DI enable setting 4	Setting range	factory value	unit	Mode of entry into force	Related models		
		0000H to FFFFH	0	--	Downtime in effect	P	S	T

This parameter is displayed in hexadecimal form on the panel, where each binary bit represents a DI function, BIT0 to BIT15 correspond to DI functions 48 to 63 respectively. the value of the binary bit indicates whether the corresponding DI function is enabled for communication control:

0: not enabled. (A)

1:Enable(A)

F09.09	Communication control DO enable setting 1	Setting range	factory value	unit	Mode of entry into force	Related models		
		0000H to FFFFH	0	--	Downtime in effect	P	S	T

This parameter is displayed in hexadecimal form on the panel, where each binary bit represents a DO function, BIT0 is reserved, BIT1 to BIT15 correspond to DO functions 1 to 15 respectively. the value of the binary bits indicates whether the corresponding DO function is enabled for communication output:

0: not enabled. (A)
1:Enable(A)

F09.10	Communication control DO enable setting 2	Setting range	factory value	unit	Mode of entry into force	Related models		
		0000H to FFFFH	0	--	Downtime in effect	P	S	T

This parameter is displayed in hexadecimal form on the panel, where each binary bit represents a DO function, BIT0 to BIT15 correspond to DO functions 16 to 31 respectively. the value of the binary bit indicates whether the corresponding DO function is enabled for communication output:

0: not enabled(A).
1:Enable(A)

F09.11	Communication setting command value maintenance time	Setting range	factory value	unit	Mode of entry into force	Related models		
		0 to 60	5	--	Effective immediately	P	S	T

The time to maintain the status quo when the communication is disconnected after the command value is written, can be set from 0 to 60 in seconds, and the setting of 0 means 0.5 seconds. (A)

F09.12	CAN communication baud rate:	Setting range	factory value	unit	Mode of entry into force	Related models		
		0 to 7	5	--	Downtime in effect	P	S	T

0: 20k(A)
1: 50k(A)
2: 100k(A)
3: 125k(A)
4: 250k(A)
5: 500k(A)
6: 800k(A)
7: 1M(A)

F09.13	Electronic gear ratio selection during communication control	Setting range	factory value	unit	Mode of entry into force	Related models		
		0～1	1	--	Downtime in effect	P	S	T

0: Use servo internal electronic gear ratio (B/D)

1: Use of communication-specific (608Fh/6091h/6092h) electronic gear ratios(B/D)

F09.14	Speed command unit selection during communication control	Setting range	factory value	unit	Mode of entry into force	Related models		
		0～1	1	--	Downtime in effect	P	S	T

0:rpm (B/D)

1:Instruction/second(B/D)

F09.15	Acceleration unit selection during communication control	Setting range	factory value	unit	Mode of entry into force	Related models		
		0～1	1	--	Downtime in effect	P	S	T

0: 0RPM-1000RPM acceleration time ms(B/D)

1:Instruction/s^2. (B/D)

F09.16	Bus communication fault detection options	Setting range	factory value	unit	Mode of entry into force	Related models		
		0～1	0	--	Downtime in effect	P	S	T

0:Disable

1:Open.

F09.17	Absolute system origin completion flag storage selection	Setting range	factory value	unit	Mode of entry into force	Related models		
		0 ~ 1	0	--	Downtime in effect	P	S	T

0:No storage
1:Storage

F09.18	EtherCAT Servo Site No.	Setting range	factory value	unit	Mode of entry into force	Related models		
		0 ~ 65535	0	--	Power up again.	P	S	T

0:-65535(B)
0:Address written by the upper computer to ground in ESC EPROM
The address determines the slave ALIAS address;
For other values, the slave ALIAS address is determined by F09:18
Settlement.
ALIAS ground when the upper unit uses automatic incremental addressing
Address Ignore.

F09.19	Bus communication synchronous phase trimming	Setting range	factory value	unit	Mode of entry into force	Related models		
		-20 to 20	0	--	Effective immediately	P	S	T

For CAN, EtherCAT, Profinet, fine-tuned synchronous jitter delay (-20 to 20) (B/D)

F09.20	Number of synchronous message loss or disconnection detection	Setting range	factory value	unit	Mode of entry into force	Related models		
		0 to 300	12	--	Effective immedia	P	S	T

					tely			

0: -300. (B/D)

Number of EtherCAT or Profinet disconnect detections, loss of synchronization data

When the number of times reaches this value, A.77 fault is reported

F09.21	EtherCAT Speed Limit Selection	Setting range	factory value	unit	Mode of entry into force	Related models		
		0000H to 0001H	1	--	Downtime in effect	P	S	T

0:The maximum speed in CSP mode is determined by the maximum speed of the motor.

Degree limit, exceeding the maximum speed will report a 78(B)

Command anomaly failure.

1:The maximum speed is limited by 6080 without reporting a fault.

Be careful that the command does not exceed the maximum limit that may

It will cause a positioning error(B)

F09.22	ECAT CSP BIT10	Setting range	factory value	unit	Mode of entry into force	Related models		
		0000H to 0001H	0	--	Downtime in effect	P	S	T

F09.23	ECAT 603Fh display format	Setting range	factory value	unit	Mode of entry into force	Related models		
		0000H to 0001H	0	--	Downtime in effect	P	S	T

F09.24	ECAT Sync Offset Setting	Setting range	factory value	unit	Mode of entry into	Related models

					force			
		0000H to 000FH	0	--	Power up again.	P		

F09.25	ECAT limit alignment setting	Setting range	factory value	unit	Mode of entry into force	Related models		
		0000H to 0001H	1	--	Power up again.	P		

F09.26	ECAT Modal Feedback Setting	Setting range	factory value	unit	Mode of entry into force	Related models		
		0000H to 0001H	0	--	Effective immedia tely	P	S	T

F09.27	ECAT Probe Configuration	Setting range	factory value	unit	Mode of entry into force	Related models		
		0000H to 0001H	0	--	Effective immedia tely	P	S	T

F09.28	ECAT overflow error setting	Setting range	factory value	unit	Mode of entry into force	Related models		
		0 ~ 1	0	--	Power up again.	P	S	T

F09.29	ECAT Synchronization Settings	Setting range	factory value	unit	Mode of entry into force	Related models		
		0 ~ 1	0	--	Power up again.	P	S	T

Group F10 Multi-segment position

F10.00	Segment 1 displacement (32 bits)	Setting range	factory value	unit	Mode of entry into force	Related models		
		-1073741824 ~ 1073741824	**10000**	**--**	**Effective immediately**	**P**		

-1073741824 ~ 1073741824

F10.02	Maximum velocity in paragraph 1	Setting range	factory value	unit	Mode of entry into force	Related models		
		1 to 1073741824	**200**	**--**	**Effective immediately**	**P**		

YSK2-A/YSK2-E:Setting range 1-6000;Unit:rpm;
YSK2-D:Setting range 1-1073741824;Unit:LU/min.

F10.04	Paragraph 1 acceleration multiplier	Setting range	factory value	unit	Mode of entry into force	Related models		
		0 ~ 65535	**10**	**--**	**Effective immediately**	**P**		

0 ~ 65535 ms

F10.05	Paragraph 1 deceleration multiplier	Setting range	factory value	unit	Mode of entry into force	Related models		
		0 ~ 65535	**10**	**--**	**Effective**	**P**		

					immedia tely			

0 ~ 65535 ms

F10.06	**Segment 2 displacement (32 bits)**	**Setting range**	**factory value**	**unit**	**Mode of entry into force**	**Related models**		
		-1073741824 ~ 1073741824	**10000**	**--**	**Effective immedia tely**	**P**		

-1073741824 ~ 1073741824

F10.08	**Paragraph 2 maximum speed**	**Setting range**	**factory value**	**unit**	**Mode of entry into force**	**Related models**		
		1 to 1073741824	**200**	**--**	**Effective immedia tely**	**P**		

YSK2-A/YSK2-E:Setting range 1-6000;Unit:rpm;
YSK2-D:Setting range 1-1073741824;Unit:LU/min.

F10.10	**Paragraph 2 acceleration multiplier**	**Setting range**	**factory value**	**unit**	**Mode of entry into force**	**Related models**		
		0 ~ 65535	**10**	**--**	**Effective immedia tely**	**P**		

0 ~ 65535 ms

F10.11	**Segment 2 deceleration multiplier**	**Setting range**	**factory value**	**unit**	**Mode of entry into force**	**Related models**		
		0 ~ 65535	**10**	**--**	**Effective immedia tely**	**P**		

0 ~ 65535 ms

F10.12	Paragraph 3 displacement (32 bits)	Setting range	factory value	unit	Mode of entry into force	Related models		
		-1073741824 ~ 1073741824	**10000**	**--**	**Effective immediately**	**P**		

-1073741824 ~ 1073741824

F10.14	Paragraph 3 maximum speed	Setting range	factory value	unit	Mode of entry into force	Related models		
		1 to 1073741824	**200**	**--**	**Effective immediately**	**P**		

YSK2-A/YSK2-E:Setting range 1-6000;Unit:rpm;
YSK2-D:Setting range 1-1073741824;Unit:LU/min.

F10.16	Paragraph 3 acceleration multiplier	Setting range	factory value	unit	Mode of entry into force	Related models		
		0 ~ 65535	**10**	**--**	**Effective immediately**	**P**		

0 ~ 65535 ms

F10.17	Paragraph 3 deceleration multiplier	Setting range	factory value	unit	Mode of entry into force	Related models		
		0 ~ 65535	**10**	**--**	**Effective immediately**	**P**		

0 ~ 65535 ms

F10.18	Paragraph 4 displacement (32 bits)	Setting range	factory value	unit	Mode of entry into force	Related models		
		-1073741824 ~ 1073741824	10000	--	Effective immediately	P		

-1073741824 ~ 1073741824

F10.20	Paragraph 4 maximum speed	Setting range	factory value	unit	Mode of entry into force	Related models		
		1 to 1073741824	200	--	Effective immediately	P		

YSK2-A/YSK2-E:Setting range 1-6000;Unit:rpm;

YSK2-D:Setting range 1-1073741824;Unit:LU/min.

F10.22	Paragraph 4 acceleration multiplier	Setting range	factory value	unit	Mode of entry into force	Related models		
		0 ~ 65535	10	--	Effective immediately	P		

0 to 65535 ms

F10.23	Paragraph 4 deceleration multiplier	Setting range	factory value	unit	Mode of entry into force	Related models		
		0 ~ 65535	10	--	Effective immediately	P		

0 to 65535 ms

F10.24	Paragraph 5 displacement (32 bits)	Setting range	factory value	unit	Mode of entry into	Related models

					force			
		-1073741824 ~ 1073741824	**10000**	**--**	**Effective immediately**	**P**		

-1073741824 ~ 1073741824

F10.26	Paragraph 5 maximum speed	Setting range	factory value	unit	Mode of entry into force	Related models		
		1 to 1073741824	**200**	**--**	**Effective immediately**	**P**		

YSK2-A/YSK2-E:Setting range 1-6000;Unit:rpm;
YSK2-D:Setting range 1-1073741824;Unit:LU/min.

F10.28	Paragraph 5 acceleration multiplier	Setting range	factory value	unit	Mode of entry into force	Related models		
		0 ~ 65535	**10**	**--**	**Effective immediately**	**P**		

0 ~ 65535 ms

F10.29	Paragraph 5 deceleration multiplier	Setting range	factory value	unit	Mode of entry into force	Related models		
		0 ~ 65535	**10**	**--**	**Effective immediately**	**P**		

0 ~ 65535 ms

F10.30	Paragraph 6 displacement (32 bits)	Setting range	factory value	unit	Mode of entry into force	Related models		
		-1073741824 ~ 1073741824	**10000**	**--**	**Effective immedia**	**P**		

					tely			

-1073741824 ~ 1073741824

F10.32	Paragraph 6 maximum speed	Setting range	factory value	unit	Mode of entry into force	Related models		
		1 to 1073741824	**200**	**--**	**Effective immediately**	**P**		

YSK2-A/YSK2-E:Setting range 1-6000;Unit:rpm;
YSK2-D:Setting range 1-1073741824;Unit:LU/min.

F10.34	Paragraph 6 acceleration multiplier	Setting range	factory value	unit	Mode of entry into force	Related models		
		0 ~ 65535	**10**	**--**	**Effective immediately**	**P**		

0 ~ 65535 ms

F10.35	Paragraph 6 deceleration multiplier	Setting range	factory value	unit	Mode of entry into force	Related models		
		0 ~ 65535	**10**	**--**	**Effective immediately**	**P**		

0 ~ 65535 ms

F10.36	Paragraph 7 displacement (32 bits)	Setting range	factory value	unit	Mode of entry into force	Related models		
		-1073741824 ~ 1073741824	**10000**	**--**	**Effective immediately**	**P**		

-1073741824 ~ 1073741824

F10.38	Paragraph 7 maximum speed	Setting range	factory value	unit	Mode of entry into force	Related models		
		1 to 1073741824	**200**	**--**	**Effective immediately**	**P**		

YSK2-A/YSK2-E:Setting range 1-6000;Unit:rpm;
YSK2-D:Setting range 1-1073741824;Unit:LU/min.

F10.40	Paragraph 7 acceleration multiplier	Setting range	factory value	unit	Mode of entry into force	Related models		
		0 ~ 65535	**10**	**--**	**Effective immediately**	**P**		

0 ~ 65535 ms

F10.41	Paragraph 7 deceleration multiplier	Setting range	factory value	unit	Mode of entry into force	Related models		
		0 ~ 65535	**10**	**--**	**Effective immediately**	**P**		

0 ~ 65535 ms

F10.42	Paragraph 8 displacement (32 bits)	Setting range	factory value	unit	Mode of entry into force	Related models		
		-1073741824 ~ 1073741824	**10000**	**--**	**Effective immediately**	**P**		

-1073741824 ~ 1073741824

F10.44	Paragraph 8 maximum	Setting range	factory	unit	Mode of	Related

	speed		**value**		**entry into force**	**models**		
		1 to 1073741824	**200**	**--**	**Effective immediately**	**P**		

YSK2-A/YSK2-E:Setting range 1-6000;Unit:rpm;

YSK2-D:Setting range 1-1073741824;Unit:LU/min.

F10.46	**Paragraph 8 acceleration multiplier**	**Setting range**	**factory value**	**unit**	**Mode of entry into force**	**Related models**		
		0 ~ 65535	**10**	**--**	**Effective immediately**	**P**		

0 ~ 65535 ms

F10.47	**Paragraph 8 deceleration multiplier**	**Setting range**	**factory value**	**unit**	**Mode of entry into force**	**Related models**		
		0 ~ 65535	**10**	**--**	**Effective immediately**	**P**		

0 ~ 65535 ms

F10.48	**Paragraph 9 displacement (32 bits)**	**Setting range**	**factory value**	**unit**	**Mode of entry into force**	**Related models**		
		-1073741824 ~ 1073741824	**10000**	**--**	**Effective immediately**	**P**		

-1073741824 ~ 1073741824

F10.50	**Paragraph 9 maximum speed**	**Setting range**	**factory value**	**unit**	**Mode of entry into force**	**Related models**		
		1 to 1073741824	**200**	**--**	**Effective**	**P**		

					immedia tely			

YSK2-A/YSK2-E:Setting range 1-6000;Unit:rpm;

YSK2-D:Setting range 1-1073741824;Unit:LU/min.

F10.52	**Paragraph 9 acceleration multiplier**	**Setting range**	**factory value**	**unit**	**Mode of entry into force**	**Related models**		
		0 ~ 65535	**10**	**--**	**Effective immedia tely**	**P**		

0 ~ 65535 ms

F10.53	**Paragraph 9 deceleration multiplier**	**Setting range**	**factory value**	**unit**	**Mode of entry into force**	**Related models**		
		0 ~ 65535	**10**	**--**	**Effective immedia tely**	**P**		

0 ~ 65535 ms

F10.54	**Paragraph 10 displacement (32 bits)**	**Setting range**	**factory value**	**unit**	**Mode of entry into force**	**Related models**		
		-1073741824 ~ 1073741824	**10000**	**--**	**Effective immedia tely**	**P**		

-1073741824 ~ 1073741824

F10.56	**Maximum speed in paragraph 10**	**Setting range**	**factory value**	**unit**	**Mode of entry into force**	**Related models**		
		1 to 1073741824	**200**	**--**	**Effective immedia tely**	**P**		

YSK2-A/YSK2-E:Setting range 1-6000;Unit:rpm;

YSK2-D:Setting range 1-1073741824;Unit:LU/min.

F10.58	Paragraph 10 acceleration multiplier	Setting range	factory value	unit	Mode of entry into force	Related models		
		0 ~ 65535	10	--	Effective immediately	P		

0 ~ 65535 ms

F10.59	Paragraph 10 deceleration multiplier	Setting range	factory value	unit	Mode of entry into force	Related models		
		0 ~ 1073741824	10	--	Effective immediately	P		

0 ~ 65535 ms

F10.60	Paragraph 11 displacement (32 bits)	Setting range	factory value	unit	Mode of entry into force	Related models		
		-1073741824 ~ 1073741824	10000	--	Effective immediately	P		

-1073741824 ~ 1073741824

F10.62	Paragraph 11 maximum speed	Setting range	factory value	unit	Mode of entry into force	Related models		
		1 to 1073741824	200	--	Effective immediately	P		

YSK2-A/YSK2-E:Setting range 1-6000;Unit:rpm;

YSK2-D:Setting range 1-1073741824;Unit:LU/min.

F10.64	Paragraph 11 acceleration multiplier	Setting range	factory value	unit	Mode of entry into force	Related models		
		0 ~ 65535	10	--	Effective immediately	P		

0 ~ 65535 ms

F10.65	Paragraph 11 deceleration multiplier	Setting range	factory value	unit	Mode of entry into force	Related models		
		0 ~ 65535	10	--	Effective immediately	P		

0 ~ 65535 ms

F10.66	Paragraph 12 displacement (32 bits)	Setting range	factory value	unit	Mode of entry into force	Related models		
		-1073741824 ~ 1073741824	10000	--	Effective immediately	P		

-1073741824 ~ 1073741824

F10.68	Maximum speed in paragraph 12	Setting range	factory value	unit	Mode of entry into force	Related models		
		1 to 1073741824	200	--	Effective immediately	P		

YSK2-A/YSK2-E:Setting range 1-6000;Unit:rpm;
YSK2-D:Setting range 1-1073741824;Unit:LU/min.

F10.70	Paragraph 12 acceleration multiplier	Setting range	factory value	unit	Mode of entry	Related models

					into force			
		0 ~ 65535	10	--	Effective immediately	P		

0 ~ 65535 ms

F10.71	Paragraph 12 deceleration multiplier	Setting range	factory value	unit	Mode of entry into force	Related models		
		0 ~ 65535	10	--	Effective immediately	P		

0 ~ 65535 ms

F10.72	Paragraph 13 displacement (32 bits)	Setting range	factory value	unit	Mode of entry into force	Related models		
		-1073741824 ~ 1073741824	10000	--	Effective immediately	P		

-1073741824 ~ 1073741824

F10.74	Paragraph 13 maximum speed	Setting range	factory value	unit	Mode of entry into force	Related models		
		1 to 1073741824	200	--	Effective immediately	P		

YSK2-A/YSK2-E:Setting range 1-6000;Unit:rpm;
YSK2-D:Setting range 1-1073741824;Unit:LU/min.

F10.76	Paragraph 13 acceleration multiplier	Setting range	factory value	unit	Mode of entry into force	Related models		
		0 ~ 65535	10	--	Effective	P		

					immedia tely			

0 ~ 65535 ms

F10.77	**Paragraph 13 deceleration multiplier**	**Setting range**	**factory value**	**unit**	**Mode of entry into force**	**Related models**		
		0 ~ 65535	**10**	**--**	**Effective immedia tely**	**P**		

0 ~ 65535 ms

F10.78	**Paragraph 14 displacement (32 bits)**	**Setting range**	**factory value**	**unit**	**Mode of entry into force**	**Related models**		
		-1073741824 ~ 1073741824	**10000**	**--**	**Effective immedia tely**	**P**		

-1073741824 ~ 1073741824

F10.80	**Paragraph 14 maximum speed**	**Setting range**	**factory value**	**unit**	**Mode of entry into force**	**Related models**		
		1 to 1073741824	**200**	**--**	**Effective immedia tely**	**P**		

YSK2-A/YSK2-E:Setting range 1-6000;Unit:rpm;

YSK2-D:Setting range 1-1073741824;Unit:LU/min.

F10.82	**Paragraph 14 acceleration multiplier**	**Setting range**	**factory value**	**unit**	**Mode of entry into force**	**Related models**		
		0 ~ 65535	**10**	**--**	**Effective immedia tely**	**P**		

0 ~ 65535 ms

F10.83	Paragraph 14 deceleration multiplier	Setting range	factory value	unit	Mode of entry into force	Related models		
		0 ~ 65535	10	--	Effective immediately	P		

0 ~ 65535 ms

F10.84	Paragraph 15 displacement (32 bits)	Setting range	factory value	unit	Mode of entry into force	Related models		
		-1073741824 ~ 1073741824	10000	--	Effective immediately	P		

-1073741824 ~ 1073741824

F10.86	Paragraph 15 maximum speed	Setting range	factory value	unit	Mode of entry into force	Related models		
		1 to 1073741824	200	--	Effective immediately	P		

YSK2-A/YSK2-E:Setting range 1-6000;Unit:rpm;

YSK2-D:Setting range 1-1073741824;Unit:LU/min.

F10.88	Paragraph 15 acceleration multiplier	Setting range	factory value	unit	Mode of entry into force	Related models		
		0 ~ 65535	10	--	Effective immediately	P		

0 ~ 65535 ms

F10.89	Paragraph 15 deceleration	Setting range	factory	unit	Mode of	Related

	multiplier		**value**		**entry into force**	**models**		
		0 ~ 65535	**10**	**--**	**Effective immediately**	**P**		

0 ~ 65535 ms

F10.90	**Paragraph 16 displacement (32 bits)**	**Setting range**	**factory value**	**unit**	**Mode of entry into force**	**Related models**		
		-1073741824 ~ 1073741824	**10000**	**--**	**Effective immediately**	**P**		

-1073741824 ~ 1073741824

F10.92	**Paragraph 16 maximum speed**	**Setting range**	**factory value**	**unit**	**Mode of entry into force**	**Related models**		
		1 to 1073741824	**200**	**--**	**Effective immediately**	**P**		

YSK2-A/YSK2-E:Setting range 1-6000;Unit:rpm;
YSK2-D:Setting range 1-1073741824;Unit:LU/min.

F10.94	**Paragraph 16 acceleration multiplier**	**Setting range**	**factory value**	**unit**	**Mode of entry into force**	**Related models**		
		0 ~ 65535	**10**	**--**	**Effective immediately**	**P**		

0 ~ 65535 ms

F10.95	**Paragraph 16 deceleration multiplier**	**Setting range**	**factory value**	**unit**	**Mode of entry into force**	**Related models**

		0 ~ 65535	**10**	**--**	**Effective immediately**	**P**		

0 ~ 65535 ms

Group F11 Origin regression, full closed loop

F11.00	Origin return start method	Setting range	factory value	unit	Mode of entry into force	Related models		
		0 to 4	0	--	Downtime in effect	P		

0:off

1:Start by DI function STHOME

2:Keyboard start

3:Communication activation

4:Start immediately after powering on the first servo ON

F11.01	Return to origin model	Setting range	factory value	unit	Mode of entry into force	Related models		
		0 to 8	2	--	Downtime in effect	P		

0:Positive rotation search origin, with positive limit as origin

1:Invert the search origin with the negative limit as the origin

2:Forward rotation search origin, using HOME_IN signal OFF→ON as the origin

3:Reverse the search origin, using the HOME_IN signal OFF→ON as the origin

4:Forward search origin, using HOME_IN signal ON→OFF as origin

5:Reverse the search origin, using the HOME_IN signal ON→OFF as the origin

6:Positive rotation looks directly for the nearest Z signal as the origin

7:Invert to find the nearest Z signal directly as the origin

8:Directly use the current position as the origin

F11.02	Home return time limit and Z signal setting	Setting range	factory value	unit	Mode of entry into force	Related models		
		0 to 5	2	--	Downtim	P		

					e in effect			

0: automatically reverses when it encounters a limit, returning to find the Z signal.

1: automatically reverses when it encounters a limit and looks directly forward for the Z signal.

2: Automatic reversal of limits encountered, without finding the Z signal.

3: Stops and alarms when a limit is encountered and returns to find the Z signal.

4: encounter a limit stop and alarm, look directly forward for the Z signal.

5: Stops and alarms when a limit is encountered, without looking for the Z signal.

Note:For the handling of encountered limits, such as regression mode 0 to 1, no alarm or stop will be made even if 3, 4 or 5 is set here.

For the Z signal, if the regression mode is 0 to 1, it is after the limit signal is encountered; if the regression mode is 2 to 5, it is after the HOME_IN signal is encountered.

F11.04	**High-speed search speed of the origin**	**Setting range**	**factory value**	**unit**	**Mode of entry into force**	**Related models**		
		1 to 3000	**500**	**1rpm**	**Effective immediately**	**P**		

1 to 3000rpm

F11.05	**Speed of low-speed search origin**	**Setting range**	**factory value**	**unit**	**Mode of entry into force**	**Related models**		
		1 to 300	**50**	**1rpm**	**Effective immediately**	**P**		

1 to 300rpm

F11.06	**Acceleration and deceleration times when searching for the origin**	**Setting range**	**factory value**	**unit**	**Mode of entry into force**	**Related models**		
		1 to 10,000	**500**	**1ms**	**Effective immediately**	**P**		

1 to 10000ms

F11.07	Time limit value for the return to home process	Setting range	factory value	unit	Mode of entry into force	Related models		
		1 to 65535	60,000	1ms	Effective immediately	P		

1 to 65535ms

F11.08	Origin coordinate offset (32 bits)	Setting range	factory value	unit	Mode of entry into force	Related models		
		-1073741824 ~ 1073741824	0	--	Effective immediately	P		

-1073741824 ~ 1073741824

F11.10	Mechanical Home Position Offset (32 bits)	Setting range	factory value	unit	Mode of entry into force	Related models		
		-1073741824 ~ 1073741824	0	--	Effective immediately	P		

-1073741824 ~ 1073741824

F11.12	DI initiates an effective way of returning to the point of origin	Setting range	factory value	unit	Mode of entry into force	Related models		
		0 ~ 1	0	--	Effective immediately	P		

0:Level valid

1: falling edge active

F11.13	Limit detection method when searching for the home position	Setting range	factory value	unit	Mode of entry into	Related models

					force			
		0 to 2	**0**	**--**	**Effective immediately**	**P**	**S**	**T**

0: Detected by DI functions 15 and 16

1:Torque limiting detection by hard limit

2:DI function or hard limit torque limit detection

F11.14	**Edge start back to original completion signal hold time**	**Setting range**	**factory value**	**unit**	**Mode of entry into force**	**Related models**		
		0 ~ 65535	**0**	**--**	**Effective immediately**	**P**		

F11.20	**Second encoder usage**	**Setting range**	**factory value**	**unit**	**Mode of entry into force**	**Related models**		
		0 to 2	**0**	**--**	**Power up again.**	**P**		

0: No external encoder is used for position feedback

1:Use external encoder as position feedback, external encoder count increases when motor direction CCW

2:Use external encoder as position feedback, external encoder count increases when motor direction CW

F11.22	**External encoder pitch (32 bits)**	**Setting range**	**factory value**	**unit**	**Mode of entry into force**	**Related models**		
		0 ~ 1073741824	**10000**	**--**	**Downtime in effect**	**P**		

Set the number of feedback pulses from the external encoder for one revolution of the motor

0 ~ 1073741824

F11.24	**Fully Closed Loop Mixing Deviation Excess Threshold (32 bits)**	**Setting range**	**factory value**	**unit**	**Mode of entry into**	**Related models**

					force			
		0 ~ 1073741824	0	--	Effective immediately	P		

0 ~ 1073741824

F11.26	Mixing deviation count setting	Setting range	factory value	unit	Mode of entry into force	Related models		
		0 to 100	0	0.01	Downtime in effect	P		

0 to 100%

F11.27	Hybrid vibration suppression gain	Setting range	factory value	unit	Mode of entry into force	Related models		
		0 to 30,000	400	0.1/s	Effective immediately	P		

1.0 to 3000.0 /s

F11.28	Mixing vibration suppression time constant	Setting range	factory value	unit	Mode of entry into force	Related models		
		0 to 30,000	0	0.1ms	Effective immediately	P		

0.0 ~ 3000.0ms

F11.30	Fully closed-loop mixed deviation external units (32 bits)	Setting range	factory value	unit	Mode of entry into force	Related models		
		-1073741824 ~ 1073741824	0	--	Display only	P		

-1073741824 ~ 1073741824

F11.32	External units for internal encoder count values (32 bits)	Setting range	factory value	unit	Mode of entry into force	Related models		
		-1073741824 ~ 1073741824	0	--	Display only	P		

-1073741824 ~ 1073741824

F11.34	External encoder count value (32 bits)	Setting range	factory value	unit	Mode of entry into force	Related models		
		-1073741824 ~ 1073741824	0	--	Display only	P		

-1073741824 ~ 1073741824

Group F12 Operator Panel Settings

F12.00	Panel default display selection	Setting range	factory value	unit	Mode of entry into force	Related models		
		0 ~ 65535	0	--	Effective immediately	P	S	T

0:Servo system status F2400
1:F1201 selected state parameter
2:F1202 selected state parameters
3:F1203 selected state parameters
4:F1204 selected state parameters
5:F1205 selected state parameters

F12.01	Panel monitoring parameter setting 1	Setting range	factory value	unit	Mode of entry into force	Related models		
		0 to 69	1	--	Effective immediately	P	S	T

0 to 69,
Parameters of group F24 except F2400 can be displayed directly in the panel. No display if set to 0

F12.02	Panel monitoring parameter setting 2	Setting range	factory value	unit	Mode of entry into force	Related models		
		0 to 69	5	--	Effective immediately	P	S	T

0 to 69, same as F1201

F12.03	Panel monitoring	Setting range	factory	unit	Mode of	Related

	parameter setting 3		value		entry into force	models		
		0 to 69	6	--	Effective immediately	P	S	T

0 to 69, same as F1201

F12.04	Panel monitoring parameter setting 4	Setting range	factory value	unit	Mode of entry into force	Related models		
		0 to 69	21	--	Effective immediately	P	S	T

0 to 69, same as F1201

F12.05	Panel monitoring parameter setting 5	Setting range	factory value	unit	Mode of entry into force	Related models		
		0 to 69	23	--	Effective immediately	P	S	T

0 to 69, same as F1201

F12.06	Time multiplier for search origin	Setting range	factory value	unit	Mode of entry into force	Related models		
		0 ~ 65535	0	--	Effective immediately	P	S	T

0 to 15

F12.07	user password	Setting range	factory value	unit	Mode of entry into force	Related models		
		0 ~ 65535	0	--	Effective	P	S	T

					immedia tely			

0 ~ 65535

F12.08	User encrypted lock screen time	Setting range	factory value	unit	Mode of entry into force	Related models		
		1 to 30	5	1 minute.	Effective immedia tely	P	S	T

1 to 30 minutes

F12.12	bit-width selection for the position feedback display (F24.13 and F24.15), the	Setting range	factory value	unit	Mode of entry into force	Related models		
		0 ~ 1	0	--	Power up again.	P	S	T

0: The counter is 32 bits.

1: The counter is 64 bits, the high 32 bits are displayed in (F2456, F2458)

F12.13	DIDO monitors whether to display in binary or hexadecimal	Setting range	factory value	unit	Mode of entry into force	Related models		
		0 ~ 1	0	--	Effective immedia tely	P	S	T

0: Displayed in binary

1:Display in hexadecimal

F12.14	Manufacturer Parameters	Setting range	factory value	unit	Mode of entry into force	Related models		
		0 ~ 65535	0	--	Display only	P	S	T

Group F23 Auxiliary functions

F23.00	Keyboard JOG trial run	Setting range	factory value	unit	Mode of entry into force	Related models		
		0 to 2000	0	--	Downtime in effect	P	S	T

0 ~ Rated speed

F23.01	Fault reset	Setting range	factory value	unit	Mode of entry into force	Related models		
		0 to 9	0	--	Downtime in effect	P	S	T

0:No operation

1:Fault reset

F23.03	Parameter recognition function	Setting range	factory value	unit	Mode of entry into force	Related models		
		0 to 99	0	--	Downtime in effect	P	S	T

0:No operation

1:Start-up positive inertia identification

2:Start reversal inertia identification

3: Reservations

4: Reservations

5:Start initial angle recognition

F23.05	Automatic calibration of	Setting range	factory	unit	Mode of	Related

	analog inputs		**value**		**entry into force**	**models**		
		0 to 2	**0**	**--**	**Downtime in effect**	**P**	**S**	**T**

0: No operation
1: AI1 adjustment
2: AI2 adjustment

F23.06	**System initialization functions**	**Setting range**	**factory value**	**unit**	**Mode of entry into force**	**Related models**		
		0 to 9	**0**	**--**	**Power up again.**	**P**	**S**	**T**

0:No operation
1:Restore factory settings (without factory parameters and motor parameters)
2:Clear fault records
7:Absolute encoder reset

F23.08	**Communication operation command input**	**Setting range**	**factory value**	**unit**	**Mode of entry into force**	**Related models**		
		0 ~ 65535	**0**	**--**	**Effective immediately**	**P**	**S**	**T**

0: No operation or stop operation
1 to 3000, Pointing speed, rpm
1102H-Communications Pointing Forward
1103H-Communications point reversal
1300H-Starting forward inertia identification
1301H-Start reversal inertia identification
1302H-Storage of identified inertia values
1500H-Start initial angle identification

F23.09	**Communication operation status output**	**Setting range**	**factory value**	**unit**	**Mode of entry into force**	**Related models**

		0 ~ 65535	**0**	**--**	**Display only**	**P**	**S**	**T**

0 ~ 65535

For communication reading

0:Identification still in progress,

1: Identify process faults,

2: Identification completed,

3:Identification parameters are stored

F23.10	**inertia recognition value**	**Setting range**	**factory value**	**unit**	**Mode of entry into force**	**Related models**		
		0 ~ 65535	**0**	**0.01**	**Effective immediately**	**P**	**S**	**T**

0 ~ 65535

F23.11	**Communication selection multi-segment command sequence number**	**Setting range**	**factory value**	**unit**	**Mode of entry into force**	**Related models**		
		0 to 16	**0**	**--**	**Effective immediately**	**P**	**S**	

0 to 16

F23.12	**Communications initiate return to the point of origin**	**Setting range**	**factory value**	**unit**	**Mode of entry into force**	**Related models**		
		0 to 9	**0**	**--**	**Effective immediately**	**P**		

0:No operation

1:Initiate origin return

F23.13	**Linear motor initial communication electrical angle identification**	**Setting range**	**factory value**	**unit**	**Mode of entry into**	**Related models**

					force			
		0 ~ 1	**0**	**--**	**Downtime in effect**	**P**	**S**	**T**

Group F24 Display parameters

F24.00	Servo Status	Setting range	factory value	unit	Mode of entry into force	Related models		
		0 ~ 65535	0	--	Display only	P	S	T

Displays the status of the drive in real time.

The following flags are present: rdy, run, E01 (fault), A81 (warning)

F24.01	Motor speed feedback	Setting range	factory value	unit	Mode of entry into force	Related models		
		-9000 to 9000	0	1rpm	Display only	P	S	T

Real-time display of motor speed in 1rpm or 1mm/s

F24.03	Motor speed command	Setting range	factory value	unit	Mode of entry into force	Related models		
		-9000 to 9000	0	1rpm	Display only	P	S	T

Real-time display of the current speed command in 1rpm or 1mm/s

F24.04	Internal torque command	Setting range	factory value	unit	Mode of entry into force	Related models		
		-5000 to 5000	0	0.1%	Display only	P	S	T

Real-time display of the internal torque command in 0.1%, i.e. as a percentage of the corresponding rated torque.

F24.05	Phase Current RMS	Setting range	factory value	unit	Mode of entry into force	Related models		
		0 ~ 65535	0	0.01A	Display only	P	S	T

Real-time display of U-phase current RMS value in 0.01A

F24.06	Busbar voltage	Setting range	factory value	unit	Mode of entry into force	Related models		
		0 ~ 65535	0	0.1V	Display only	P	S	T

Real-time display of busbar voltage values in 0.1V

F24.07	Inertia discrimination value	Setting range	factory value	unit	Mode of entry into force	Related models		
		0 ~ 65535	0	0.01 ㎏ c ㎡	Display only	P	S	T

0.01kgc ㎡ ~ 655.35kgc ㎡

F24.08	Input position command corresponds to speed	Setting range	factory value	unit	Mode of entry into force	Related models		
		-9000 to 9000	0	1rpm	Display only	P	S	T

Real-time display of the speed corresponding to the input position command in 1rpm or 1mm/s

F24.09	electric angle	Setting range	factory value	unit	Mode of entry into force	Related models		
		0 ~ 65535	0	0.1°	Display only	P	S	T

Real-time display of electrical angle values in 0.1°

F24.10	Mechanical angle	Setting range	factory value	unit	Mode of entry into force	Related models		
		0 ~ 65535	0	0.1°	Display only	P	S	T

Real-time display of the angle value of the motor axis in 0.1°

F24.11	Input instruction counter (32 bits)	Setting range	factory value	unit	Mode of entry into	Related models

					force			
		-1073741824 ~ 1073741824	0	1Unit	Display only	P	S	T

Real-time display of the total number of input command pulses, in command units.

The range of the displayed value is:-1073741824 ~ 1073741824

F24.13	Feedback position pulse unit (32 bits)	Setting range	factory value	unit	Mode of entry into force	Related models		
		-1073741824 ~ 1073741824	0	1P	Display only	P	S	T

Real-time display of the absolute value of the position feedback in units of the minimum encoder resolution.

The range of the displayed value is:-1073741824 ~ 1073741824

F24.15	Feedback position command unit (32 bits)	Setting range	factory value	unit	Mode of entry into force	Related models		
		-1073741824 ~ 1073741824	0	1Unit	Display only	P	S	T

Real-time display of the absolute position absolute value in command units.

The range of the displayed value is:-1073741824 ~ 1073741824

F24.17	Position deviation pulse units (32 bits)	Setting range	factory value	unit	Mode of entry into force	Related models		
		-1073741824 ~ 1073741824	0	1P	Display only	P	S	T

Real-time display of position deviation values in units of the minimum encoder resolution.

The range of the displayed value is:-1073741824 ~ 1073741824

F24.19	Position deviation order units (32 bits)	Setting range	factory value	unit	Mode of entry into force	Related models		
		-1073741824 ~ 1073741824	0	1Unit	Display only	P	S	T

Position deviation is displayed in real time as command units.

F24.21	Digital input signal	Setting range	factory	unit	Mode of	Related

	monitoring		value		entry into force	models		
		0 to 31	0	--	Display only	P	S	T

The status of DI1 to DI9 is displayed in real time.

When the third bit from the right of F07.21 is 0, the upper half of the digital tube is displayed when the current DI port is high, and when it is low, the lower half is displayed, from right to left, DI1 to DI9 in that order.

When the third bit from the right of F07.21 is 1, a binary 1 is used when it is high, and a binary 0 is used when it is low, and binary bits BIT0 to BIT8 are used for DI1 to DI9, respectively.

F24.23	Digital output signal monitoring	Setting range	factory value	unit	Mode of entry into force	Related models		
		0 to 63	0	--	Display only	P	S	T

The status of DO1 to DO9 is displayed in real time.

When the third bit from the right of F07.21 is 0, the upper half of the digital tube is displayed when the current DO port is output high, and the lower half is displayed when it is output low, from right to left, in the order of DO1 to DO9.

When the third bit from the right of F07.21 is 1, binary 1 is used for outputting high level, and binary 0 is used for outputting low level, and binary bits BIT0 to BIT8 are used for DO1 to DO9, respectively.

F24.24	Encoder Status	Setting range	factory value	unit	Mode of entry into force	Related models		
		0 ~ 65535	0	--	Display only	P	S	T

Encoder Status

F24.25	Total power-up time (32 bits)	Setting range	factory value	unit	Mode of entry into force	Related models		
		0 to 2147483647	0	0.1s	Display only	P	S	T

Real-time display of the drive's cumulative total power-up time value.

The range of displayed values is:0.0:214748364.7s

F24.27	AI1 voltage correction value	Setting range	factory value	unit	Mode of entry into force	Related models

		-32768 to 32767	0	1mV	Display only	P	S	T

The voltage value of AI1 is displayed in real time and has been calibrated.

F24.28	AI2 voltage correction value	Setting range	factory value	unit	Mode of entry into force	Related models		
		-32768 to 32767	0	1mV	Display only	P	S	T

The voltage value of AI2 is displayed in real time and has been corrected.

F24.29	AI1 voltage raw value	Setting range	factory value	unit	Mode of entry into force	Related models		
		-32768 to 32767	0	1mV	Display only	P	S	T

Real-time display of the raw voltage value of AI1, not yet calibrated

F24.30	AI2 voltage raw value	Setting range	factory value	unit	Mode of entry into force	Related models		
		-32768 to 32767	0	1mV	Display only	P	S	T

Real-time display of the raw voltage value of AI2, not yet calibrated

F24.31	Module temperature value	Setting range	factory value	unit	Mode of entry into force	Related models		
		0 ~ 65535	0	1°C	Display only	P	S	T

Real-time display of module temperature values

F24.32	Number of absolute position encoder turns (32 bits)	Setting range	factory value	unit	Mode of entry into force	Related models		
		-1073741824 ~ 1073741824	0	--	Display only	P	S	T

Record the number of revolutions made in absolute position

F24.34	Absolute position encoder single-turn position (32 bits)	Setting range	factory value	unit	Mode of entry into force	Related models		
		-1073741824 ~ 1073741824	0	1Unit	Display only	P	S	T

Record the number of encoder pulses for less than one revolution in absolute position

F24.36	load factor	Setting range	factory value	unit	Mode of entry into force	Related models		
		0 to 500	0	1%	Display only	P	S	T

-

F24.37	Regenerative load factor	Setting range	factory value	unit	Mode of entry into force	Related models		
		0 to 500	0	1%	Display only	P	S	T

-

F24.38	Version number 1	Setting range	factory value	unit	Mode of entry into force	Related models		
		0 ~ 65535	0	0.01	Display only	P	S	T

Show software version number

F24.39	Version number 2	Setting range	factory value	unit	Mode of entry into force	Related models		
		0 ~ 65535	0	0.01	Display only	P	S	T

Show software version number

F24.40	Version number 3	Setting range	factory value	unit	Mode of entry into force	Related models

		0 ~ 65535	0	0.01	Display only	P	S	T

Show software version number

F24.41	Display of fault records	Setting range	factory value	unit	Mode of entry into force	Related models		
		0 to 9	0	--	Effective immediately	P	S	T

Can be set to 0 to 9 to view 10 fault records. When there is a current fault, set to 0 to display the current fault record; when there is no current fault, display the last 10 fault records.

0: Current fault species

1: Previous 1 failure

2: First 2 failures

......

9: First 9 breakdowns

F24.42	fault code	Setting range	factory value	unit	Mode of entry into force	Related models		
		0 ~ 65535	0	--	Display only	P	S	T

Fault codes, please refer to the list of alarm codes for the meaning of the corresponding values

F24.43	Fault timestamp (32-bit)	Setting range	factory value	unit	Mode of entry into force	Related models		
		0 to 2147483647	0	0.1s	Display only	P	S	T

The cumulative value of the total power-up time when a fault occurs.

F24.45	Current speed at failure	Setting range	factory value	unit	Mode of entry into force	Related models		
		-9000 to 9000	0	1rpm	Display only	P	S	T

Motor speed at the time of failure

F24.46	Instantaneous current at fault	Setting range	factory value	unit	Mode of entry into force	Related models		
		0 ~ 65535	0	0.01A	Display only	P	S	T

Instantaneous value of the phase current at the time of the fault

F24.47	Busbar voltage at fault	Setting range	factory value	unit	Mode of entry into force	Related models		
		0 ~ 65535	0	0.1V	Display only	P	S	T

Busbar voltage value in case of fault

F24.48	Input terminal status at fault	Setting range	factory value	unit	Mode of entry into force	Related models		
		0 to 511	0	--	Display only	P	S	T

The status of DI1 to DI9 when a fault occurs. When the current DI port is high, the upper half of the digital tube is displayed, and when it is low, the lower half is displayed.

F24.49	Output terminal status at fault	Setting range	factory value	unit	Mode of entry into force	Related models		
		0 to 511	0	--	Display only	P	S	T

The status of DO1 to DO9 when a fault occurs. When the current DO port is high, the upper half of the digital tube is displayed, and when it is low, the lower half is displayed.

F24.50	Product Series Code	Setting range	factory value	unit	Mode of entry into force	Related models		
		0 ~ 65535	0	--	Display only	P	S	T

Show custom series number

F24.52	Internal warning codes	Setting range	factory value	unit	Mode of entry into	Related models

					force			
		0 ~ 65535	0	--	Display only	P	S	T

Real-time display of internal warning codes

F24.53	Internal instruction current segment number	Setting range	factory value	unit	Mode of entry into force	Related models		
		0 to 99	0	--	Display only	P	S	T

Displays the serial number of the currently executing segment of the internal multi-segment position instruction

F24.54	Custom Edition Series No.	Setting range	factory value	unit	Mode of entry into force	Related models		
		0 ~ 65535	0	--	Display only	P	S	T

Custom Edition Series No.

F24.55	Absolute position counter high 32 bits (32 bits)	Setting range	factory value	unit	Mode of entry into force	Related models		
		-1073741824 ~ 1073741824	0	--	Display only	P	S	T

When bit 4 of F07.19 is 1, the absolute position is 64 bits counted, and it is shown here in the high 32 bits, in instruction units.

F24.57	Feedback pulse counter high 32 bits (32 bits)	Setting range	factory value	unit	Mode of entry into force	Related models		
		-1073741824 ~ 1073741824	0	--	Display only	P	S	T

When bit 4 of F07.19 is 1, the feedback pulses are counted using 64 bits, and it is shown here in the high 32 bits, in encoder units

F24.60	Analog mode feedback count display (32-bit)	Setting range	factory value	unit	Mode of entry into force	Related models

		-1073741824 ~ 1073741824	0	--	Display only	P	S	T

F24.62	Protocol Stack Version	Setting range	factory value	unit	Mode of entry into force	Related models		
		0 ~ 65535	0	--	Display only	P	S	T

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F24.63	Profidrive version number	Setting range	factory value	unit	Mode of entry into force	Related models		
		0 ~ 65535	0	--	Display only	P	S	T

-

F24.64	Network Status Display	Setting range	factory value	unit	Mode of entry into force	Related models		
		0 ~ 65535	0	--	Display only	P	S	T

-

F24.65	MAC address display 1	Setting range	factory value	unit	Mode of entry into force	Related models		
		0 ~ 65535	0	--	Display only	P	S	T

-

F24.66	MAC address display 2	Setting range	factory value	unit	Mode of entry into force	Related models		
		0 ~ 65535	0	--	Display only	P	S	T

-

F24.67	MAC address display 3	Setting range	factory value	unit	Mode of entry into force	Related models		
		0 ~ 65535	0	--	Display only	P	S	T

-

F24.68	MAC address display 4	Setting range	factory value	unit	Mode of entry into force	Related models		
		0 ~ 65535	0	--	Display only	P	S	T

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11.3 Detailed description of the object dictionary for YSK2-E

Object 213Ah :Absolute position encoder turns 32bit			
Object Description		Object entry description	
properties	happen to	properties	happen to
index	213Ah	subindex	00h
name (of a thing)	Absolute position encoder single-turn position 32bit	Access Properties	ro
data structure	Variable	PDO Mapping Type	TPDO
data type	Integer32	Data range	-2147483648~2147483647
operating mode	ALL	default value	0
Reflects the number of real absolute position encoder turns, same as servo parameter F24.32			

Object 213Bh :Absolute position encoder single-turn position 32bit			
Object Description		Object entry description	
properties	happen to	properties	happen to
index	213Bh	subindex	00h
name (of a thing)	Absolute position encoder single-turn position 32bit	Access Properties	ro
data structure	Variable	PDO Mapping Type	TPDO
data type	Integer32	Data range	-2147483648~2147483647
operating mode	ALL	default value	0
Reflects the real absolute position encoder single-turn position, same as servo parameter F24.34			

Object 213Ch :Absolute encoder position (low 32bit)			
Object Description		Object entry description	
properties	happen to	properties	happen to
index	213Ch	subindex	00h
name (of a thing)	Absolute encoder position (low 32bit)	Access Properties	ro
data structure	Variable	PDO Mapping Type	TPDO
data type	Integer32	Data range	-2147483648~2147483647
operating mode	ALL	default value	0
Reflects real absolute encoder position (low 32bit))			

Object 213Dh :Absolute encoder position (high 32bit)			
Object Description		Object entry description	
properties	happen to	properties	happen to
index	213Dh	subindex	00h
name (of a thing)	Absolute encoder position	Access Properties	ro

	(high 32bit)		
data structure	Variable	PDO Mapping Type	TPDO
data type	Integer32	Data range	-2147483648~2147483647
operating mode	ALL	default value	0
Reflects real absolute encoder position (high 32bit))			

Object 213F$_h$:Servo internal error code			
Object Description		Object entry description	
properties	happen to	properties	happen to
index	213F$_h$	subindex	00$_h$
name (of a thing)	error code	Access Properties	ro
data structure	Variable	PDO Mapping Type	TPDO
data type	unsigned16	Data range	0~65535
operating mode	ALL	default value	0
Displays the servo drive error code to match the numeric value of the panel display error code			

Object 2141$_h$:Analog input 1			
Object Description		Object entry description	
properties	happen to	properties	happen to
index	2141$_h$	subindex	00$_h$
name (of a thing)	Analog input 1	Access Properties	ro
data structure	Variable	PDO Mapping Type	TPDO
data type	Integer16	Data range	-32768~32767
operating mode		default value	0
Displays the value of servo analog channel 1, same as servo parameter F24.27			

Object 2142$_h$:Analog input 2			
Object Description		Object entry description	
properties	happen to	properties	happen to
index	2142$_h$	subindex	00$_h$
name (of a thing)	Analog input 2	Access Properties	ro
data structure	Variable	PDO Mapping Type	TPDO
data type	Integer16	Data range	-32768~32767
operating mode		default value	0
Displays the value of servo analog channel 2, same as servo parameter F24.28			

Object 603F$_h$:Error code			
Object Description		Object entry description	
properties	happen to	properties	happen to
index	603F$_h$	subindex	00$_h$
name (of a thing)	error code	Access Properties	ro
data structure	Variable	PDO Mapping Type	TPDO
data type	unsigned16	Data range	0~65535

operating mode	ALL	default value	0
CiA protocol fault code displayed Note: This is not a servo internal fault alarm code, servo fault alarm code see 213Fh			

Object 6040h :control word

Object Description		Object entry description	
properties	happen to	properties	happen to
index	6040_h	subindex	00_h
name (of a thing)	control word	Access Properties	rw
data structure	Variable	PDO Mapping Type	RPDO
data type	unsigned16	Data range	0~65535
operating mode	ALL	default value	0

Used to enable, clear alarms, start the given command in each mode, etc.

bit	meaning	
0	Servo ready.	0: Invalid 1: Valid
1	Turn on the main circuit power	0: Invalid 1: Valid
2	quick stop	1: Invalid 0: Valid
3	Servo operation	0: Invalid 1: Valid
4~6	Related to the operation control mode	
7	Fault reset	Bit7 rising edge active When Bit7 is held to 1, other control commands are invalid
8	pause (media player)	0: Invalid 1: Valid
9~15	retain	

Note: 1. Each bit of the status word is meaningless on its own, and must be used together with other bits to form a control instruction.

2. bit0~bit3 must send commands in order to switch the servo by CiA402 state machine flow and import the expected state correctly

Object 6041h :status word

Object Description		Object entry description	
properties	happen to	properties	happen to
index	6041_h	subindex	00_h
name (of a thing)	status word	Access Properties	ro
data structure	Variable	PDO Mapping Type	TPDO
data type	unsigned16	Data range	0~65535
operating mode	ALL	default value	0

bit	meaning	
0	Servo ready.	0: Invalid 1: Valid
1	Servo operation can be turned on	0: Invalid 1: Valid

2	Servo operation status	0: Invalid 1: Valid
3	Servo failure	0: Invalid 1: Valid
4	Turn on main circuit voltage	0: Invalid 1: Valid
5	quick stop	1: Invalid 0: Valid
6	Servo not operational	0: Invalid 1: Valid
7	warning	0: Invalid 1: Valid
8	Manufacturer customization	retain
9	remote control	0: Invalid 1: Valid
10	Target arrival (related to operational control mode)	0: Invalid 1: Valid
11	Internal software limits	0: Invalid 1: Valid
12	Related to the operation control mode	
13	Related to the operation control mode	
14	Manufacturer customization	retain
15	Back to original completion	0: Invalid 1: Valid Absolute system, F08.240= 1, back to home will store bit15 set to 1 (power down hold), F23.06= 7 clear back to original BIT15 status bit

The following are the basic status words (X is denoted as any value)

The initialization failure status should read (Not ready to switch). XXXX XXXX X0XX 0000	Servo start failure (Switch on disable). XXXX XXXX X1XX 0000
Servo ready (Ready to switch on). XXXX XXXX X01X 0001	Servo start (Switch on). XXXX XXXX X01X 0011
Servo operation enable. XXXX XXXX X01X 0111	Quick stop active. XXXX XXXX X00X 0111
The status of the servo fault should be (Fault). XXXX XXXX X0XX 1000	Fault reaction active (FRA). XXXX XXXX X0XX 1111

Note: After the control word 6040h sends the commands in sequence, the status word 6041h feedback displays the current status determined by the servo

Object 605A$_h$:Quick stop method selection

Object Description		Object entry description	
properties	happen to	properties	happen to
index	605A$_h$	subindex	00$_h$
name (of a thing)	Quick Stop Method Selection	Access Properties	rw
data structure	Variable	PDO Mapping Type	NO
data type	Integer16	Data range	0~7
operating mode	ALL	default value	1

When control word 6040hbit2=0, the fast stop method is determined by 605Ah

setpoint	Shutdown method
0	Free to stop and stay free
1	Decelerate and stop at 6084h deceleration time to maintain free

2	Decelerate and stop at 6085h deceleration time, keep free
3	Decelerate and stop at 6085h deceleration time, keep free
4	Not defined, cannot be set
5	Decelerate to stop at 6084h deceleration time and hold position lock
6	Decelerate to stop at 6085h deceleration time and hold position lock
7	Decelerate to stop at 6085h deceleration time and hold position lock

Note: 605A h set to 0, the stop will be affected by the P06.26 parameter: if hair.26 set to 0, the emergency stop mode is free stop; if F08.26 set to 1 or 2, the emergency stop will be decelerated to stop according to 6084h, after stopping both remain free 605A h is set to any of 1, 2, 3, 5, 6, 7 and ALL mode for emergency stop as described in the table above

Object 605B$_h$:Motor deceleration stop method			
Object Description		Object entry description	
properties	happen to	properties	happen to
index	605D$_h$	subindex	00$_h$
name (of a thing)	Motor deceleration stop method	Access Properties	rw
data structure	Variable	PDO Mapping Type	NO
data type	Integer16	Data range	0~1
operating mode	ALL	default value	1

setpoint	Shutdown method
0	Press P06.26 to set the shutdown mode
1	Deceleration stop by 6084h

ALL mode OFF shutdown, (1) If 605B = 0, shutdown as set in F08.26

Free stop when F08.26 = 0.

When F08.26 = 1, decelerate to stop at 6084h.

When F08.26 = 2, decelerate to stop by 6085

(2) If 605B = 1, then decelerate and stop at 6084h

Object 605D$_h$:Pause method selection			
Object Description		Object entry description	
properties	happen to	properties	happen to
index	605D$_h$	subindex	00$_h$
name (of a thing)	Pause method selection	Access Properties	rw
data structure	Variable	PDO Mapping Type	NO
data type	Integer16	Data range	-32768~32767
operating mode	ALL	default value	1

When the control word 6040hbit8 pause function is active, the pause effect is determined by 605Dh

setpoint	Shutdown method
0	Not supported, cannot be set
1	Press 6084h deceleration time to decelerate, then hold position lock
2	Press 6085h deceleration time to slow down, then hold position lock

Note: 605D h is set to 1 or 2 and ALL mode is paused in the manner described in the table above.

Object 6060h :Control mode			
Object Description		Object entry description	
properties	happen to	properties	happen to
index	6060_h	subindex	00_h
name (of a thing)	Control mode	Access Properties	rw
data structure	Variable	PDO Mapping Type	RPDO
data type	integer8	Data range	0~10
operating mode	ALL	default value	0

Select the control mode to run

setpoint	meaning	
0	retain	
1	Profile Position Mode (PP)	Reference0 Chapter
2	speed mode	No support
3	Profile Velocity Mode (PV)	Reference0 Chapter
4	Profile Torque Mode (PT)	Reference0 Chapter
5	retain	
6	Back to Original Mode (HM)	Reference0 Chapter
7	Interpolation Position Mode (IP)	
8	Cyclic Synchronous Position Mode (CSP)	Reference0 Chapter
9	Cycle Synchronous Bit Velocity Mode (CSV)	Reference0 Chapter
10	Cyclic Synchronous Torque Mode (CST)	Reference0 Chapter

Object 6061h :Control mode display			
Object Description		Object entry description	
properties	happen to	properties	happen to
index	6061_h	subindex	00_h
name (of a thing)	Control mode display	Access Properties	ro
data structure	Variable	PDO Mapping Type	TPDO
data type	integer8	Data range	0~10
operating mode	ALL	default value	0

Displays the control mode in which the servo is running

numerical value	meaning	
0	retain	
1	Profile Position Mode (PP)	Reference0 Chapter
2	speed mode	No support
3	Profile Velocity Mode (PV)	Reference0 Chapter
4	Profile Torque Mode (PT)	Reference0 Chapter
5	retain	

6	Back to Original Mode (HM)	Reference0 Chapter
7	Interpolation Position Mode (IP)	
8	Cyclic Synchronous Position Mode (CSP)	Reference0 Chapter
9	Cycle Synchronous Bit Velocity Mode (CSV)	Reference0 Chapter
10	Cyclic Synchronous Torque Mode (CST)	Reference0 Chapter

Object 6062h :user location command			
Object Description		Object entry description	
properties	happen to	properties	happen to
index	6062h	subindex	00h
name (of a thing)	user location instruction	Access Properties	ro
data structure	Variable	PDO Mapping Type	TPDO
data type	Integer32	Data range	-2147483648~2147483647
operating mode	PC	default value	0
Real-time display of position commands (user units)			

Object 6063h :Motor position feedback			
Object Description		Object entry description	
properties	happen to	properties	happen to
index	6063h	subindex	00h
name (of a thing)	Motor position feedback	Access Properties	ro
data structure	Variable	PDO Mapping Type	TPDO
data type	Integer32	Data range	-2147483648~2147483647
operating mode	ALL	default value	0
Real-time display of absolute motor position feedback, in line with F24.13 (encoder units)			

Object 6064h :User Location Feedback			
Object Description		Object entry description	
properties	happen to	properties	happen to
index	6064h	subindex	00h
name (of a thing)	User Location Feedback	Access Properties	ro
data structure	Variable	PDO Mapping Type	TPDO
data type	Integer32	Data range	-2147483648~2147483647
operating mode	ALL	default value	0
Reflects real-time user absolute position feedback, consistent with F24.15 (command units)			

Object 6065h :User position deviation too large threshold	
Object Description	Object entry description

properties	happen to	properties	happen to
index	6065_h	subindex	00_h
name (of a thing)	User Position Deviation Excess Threshold	Access Properties	rw
data structure	Variable	PDO Mapping Type	RPDO
data type	unsigned32	Data range	0~4294967295
operating mode	PP/CSP/HM	default value	1000000000
If the difference between user position command 6062h and user position feedback 6064h exceeds ±6065h, a position deviation fault occurs Err.043			

Object 6066_h :Position deviation time window			
Object Description		Object entry description	
properties	happen to	properties	happen to
index	6066_h	subindex	00_h
name (of a thing)	Position deviation time window	Access Properties	rw
data structure	Variable	PDO Mapping Type	RPDO
data type	Unsigned16	Data range	0~65535
operating mode	PP/CSP/HM	default value	0
If the value of 60F4h exceeds the 6065h setting range and the duration is greater than the 6066h setting, bit 13 of the 6041h status word will be set to 1.			

Object 6067_h :Position reached threshold			
Object Description		Object entry description	
properties	happen to	properties	happen to
index	6067_h	subindex	00_h
name (of a thing)	Position reaches threshold	Access Properties	rw
data structure	Variable	PDO Mapping Type	RPDO
data type	unsigned32	Data range	0~4294967295
operating mode	PP/CSP/HM	default value	1000000000
In position mode, the difference between the user position command 6062h and the actual user position feedback 6064h is within ±6067h, and the position is considered to be reached when the time reaches 6068h, bit10=1 of status word 6041h Position mode, this flag bit is meaningful when servo enable is active; otherwise, it is meaningless Note: The position arrival threshold is the smaller of the F04.61 and 6067h values, and the positioning completion output is also related to F04.62			

Object 6068_h :Position arrival time window			
Object Description		Object entry description	
properties	happen to	properties	happen to
index	6068_h	subindex	00_h
name (of a thing)	Location arrival time	Access Properties	rw
data structure	Variable	PDO Mapping Type	RPDO
data type	Unsigned16	Data range	0~65535

operating mode	PP/CSP/HM	default value	0
In position mode, the difference between the user position command 6062h and the actual user position feedback 6064h is within ±6067h, the position is considered to be reached, and after the 6068h set time delay, the status word 6041h bit10 is output as 1			

Object $606B_h$:User speed command value			
Object Description		Object entry description	
properties	happen to	properties	happen to
index	$606B_h$	subindex	00_h
name (of a thing)	User speed command value	Access Properties	ro
data structure	Variable	PDO Mapping Type	TPDO
data type	integer 32	Data range	-2147483648~2147483647
operating mode	PV/CSV	default value	0
Reflects the user's actual speed command, consistent with F24.03 if converted to RPM units			

Object $606C_h$:Actual user speed feedback			
Object Description		Object entry description	
properties	happen to	properties	happen to
index	$606C_h$	subindex	00_h
name (of a thing)	Actual user speed feedback	Access Properties	ro
data structure	Variable	PDO Mapping Type	TPDO
data type	integer 32	Data range	-2147483648~2147483647
operating mode	ALL	default value	0
Reflects actual user speed feedback value, consistent with F24.01 if converted to RPM units			

Object $606D_h$:Speed reaches threshold			
Object Description		Object entry description	
properties	happen to	properties	happen to
index	$606D_h$	subindex	00_h
name (of a thing)	Speed reaches threshold	Access Properties	rw
data structure	Variable	PDO Mapping Type	RPDO
data type	Unsigned16	Data range	0~65535
operating mode	PV/CSV	default value	65535
If the difference between the target speed 60FFh and the actual user speed 606Ch is within ±606Dh, and the time reaches 606Eh, the speed is considered to be reached, bit 10 of status word 6041h = 1, and the DO output is valid. Profile speed mode and synchronous cycle speed mode, this flag bit is meaningful when servo enable is active, otherwise it is meaningless			

Object $606E_h$:velocity arrival time window			
Object Description		Object entry description	
properties	happen to	properties	happen to
index	$606E_h$	subindex	00_h
name (of a thing)	Speed arrival time	Access Properties	rw

data structure	Variable	PDO Mapping Type	RPDO
data type	Unsigned16	Data range	0~65535
operating mode	PV/CSV	default value	0
If the difference between the target speed 60FFh and the actual user speed 606Ch is within ±606Dh, and the time reaches 606Eh, the speed is considered to be reached, bit 10 of status word 6041h = 1, and the DO output is valid. This flag bit is meaningful when servo enable is active in profile speed mode and synchronous cycle speed mode, otherwise it is meaningless			

Object 606Fh :Zero Speed Threshold			
Object Description		Object entry description	
properties	happen to	properties	happen to
index	$606F_h$	subindex	00_h
name (of a thing)	Zero Speed Threshold	Access Properties	rw
data structure	Variable	PDO Mapping Type	RPDO
data type	Unsigned16	Data range	0~65535
operating mode	PV	default value	65535
User speed feedback 606Ch Within ±606Fh and time to 606Eh setting means user speed is 0, then bit12=1 for 6041h Contour speed mode, this flag bit has meaning; otherwise it has no meaning. This flag bit is not related to servo enable or not			

Object 6071h :Torque target value			
Object Description		Object entry description	
properties	happen to	properties	happen to
index	6071_h	subindex	00_h
name (of a thing)	Torque target value	Access Properties	rw
data structure	Variable	PDO Mapping Type	RPDO
data type	integer16	Data range	-5000~5000
operating mode	PT/CST	default value	0
Torque giving in PT/CST mode, in 0.1% 100.0% Corresponds to 1 times the rated torque of the motor			

Object 6072h :Maximum torque			
Object Description		Object entry description	
properties	happen to	properties	happen to
index	6072_h	subindex	00_h
name (of a thing)	Maximum torque	Access Properties	rw
data structure	Variable	PDO Mapping Type	RPDO
data type	unsigned16	Data range	0~5000
operating mode	ALL	default value	5000
Set the maximum torque of the motor, maximum torque command (in 0.1%) 6072h The smaller of the maximum torque and internal torque limiting parameters (F05.07, 05.08) is valid			

Object 6074h :User-given torque value	
Object Description	Object entry description

properties	happen to	properties	happen to
index	6074_h	subindex	00_h
name (of a thing)	User-given torque value	Access Properties	ro
data structure	Variable	PDO Mapping Type	RPDO
data type	integer16	Data range	-5000~5000
operating mode	ALL	default value	0
Real-time display of the internal given torque value in 0.1% in servo operation 100.0% Corresponds to 1 times the rated torque of the motor			

Object 6077_h :Actual torque feedback			
Object Description		Object entry description	
properties	happen to	properties	happen to
index	6077_h	subindex	00_h
name (of a thing)	Actual torque feedback	Access Properties	ro
data structure	Variable	PDO Mapping Type	TPDO
data type	integer16	Data range	-5000~5000
operating mode	ALL	default value	0
Real-time display of servo internal torque feedback 100.0% corresponds to 1 times the rated torque of the motor and should be consistent with F24.04. Unit 0.1%			

Object 6078_h :Actual current value			
Object Description		Object entry description	
properties	happen to	properties	happen to
index	6078_h	subindex	00_h
name (of a thing)	Actual current value	Access Properties	ro
data structure	Variable	PDO Mapping Type	TPDO
data type	integer16	Data range	-32768~32767
operating mode	ALL	default value	0
Real-time display of actual current value (in 0.1% of nominal value)			

Object 6079_h :DC bus voltage value			
Object Description		Object entry description	
properties	happen to	properties	happen to
index	6079_h	subindex	00_h
name (of a thing)	DC bus voltage value	Access Properties	ro
data structure	Variable	PDO Mapping Type	TPDO
data type	Unsigned32	Data range	0~4294967295
operating mode	ALL	default value	0
Display bus voltage (unit: 1mv), should be consistent with F24.06 bus voltage value			

Object $607A_h$:Target position value			
Object Description		Object entry description	

properties	happen to	properties	happen to
index	$607A_h$	subindex	00_h
name (of a thing)	Target position value	Access Properties	rw
data structure	Variable	PDO Mapping Type	RPDO
data type	Integer32	Data range	-2147483648~2147483647
operating mode	PP/CSP	default value	0
Setting the servo target position in profile position mode and synchronous cycle position mode Contour position mode: if running absolute command, user absolute position 6064h = 607Ah when positioning is complete; if running relative command, user displacement increment = 607Ah when positioning is complete			

Object $607C_h$:home offset			
Object Description		Object entry description	
properties	happen to	properties	happen to
index	$607C_h$	subindex	00_h
name (of a thing)	origin offset	Access Properties	rw
data structure	Variable	PDO Mapping Type	RPDO
data type	Integer32	Data range	-2147483648~2147483647
operating mode	HM	default value	0
1. After the home point is back to zero, the motor stop position is the mechanical home point. By setting 607Ch, the relationship between mechanical home point and mechanical zero can be set: mechanical home point = mechanical zero + 607C (home point offset) When 607C=0, the mechanical home point and mechanical zero coincide 2. Home bias effective condition: power-on operation, home return operation completed, bit15=1 of status word 6041h 3. In home return to zero mode, the upper computer should first select the home return to zero mode (6098h), and set the return to zero speed (6099-1h 6099-2h), return to zero acceleration (609Ah), after giving the home return to zero trigger signal, the servo will automatically find the mechanical home point according to the setting, and complete the relative position relationship between the mechanical home point and the mechanical zero point setting. For example: by returning to zero mode 35, with the current position as the mechanical origin, after triggering the origin back to zero, the user's current position 6064h = 607Ch, the motor shaft is not rotating Machine Home: A fixed position on the machine, corresponding to the home switch, limit switch, motor Z signal, etc. Mechanical zero point: absolute 0 position on the machine			

Object $607D_h$:Soft limit			
Object Description		Object entry description	
properties	happen to	properties	happen to
index	$607D_h$	subindex	00_h
name (of a thing)	Number of soft limit subindexes	Access Properties	Rw
data structure	/	PDO Mapping Type	RPDO
data type	Unsigned8	Data range	0~512
operating mode	ALL	default value	2
When the position feedback reaches the internal soft limit, it will stop at the limit value reached, and the servo reports an overtravel warning (AL.087 or AL.088) with bit15=1 in status word 6041h, which means the soft limit is in effect. At this point, inputting a reverse motion command will take the servo out of the position overrun state and clear bit15 to zero			

In torque mode and speed mode, the soft limit function is constrained by F08.04, when F08.04=1, the soft limit is not valid. Turn on the soft limit F08.04=0, F08.34=1 or 2 according to the following.			
Object Description		Object entry description	
properties	happen to	properties	happen to
index	$607D_h$	Subindex.	01_h
name (of a thing)	Minimum Software Location Limits	Access Properties	Rw
data structure	/	PDO Mapping Type	RPDO
data type	Integer32	Data range	-2147483648~2147483647
operating mode	ALL	default value	-2147483648
Soft limit function: F08.34 0: No software limit on 1: Soft limit function is turned on when the drive is powered up 2: Turn on the software limit function after the drive home return Set the minimum value of the software absolute position limit, when -2147483648 means no limit in the negative direction Minimum absolute software position limit = (607D-01h)			

properties	happen to	properties	happen to
index	$607D_h$	Subindex.	02_h
name (of a thing)	Maximum Software Location Limits	Access Properties	Rw
data structure	/	PDO Mapping Type	RPDO
data type	Integer32	Data range	-2147483648~2147483647
operating mode	ALL	default value	2147483647
Soft limit function: F08.34 0: No software limit on 1: Soft limit function is turned on when the drive is powered up 2: Turn on the software limit function after the drive home return. Set the minimum value of the software absolute position limit, when it is 2147483647, it means no limit in positive direction Maximum software absolute position limit = (607D-02h)			

Object $607E_h$:Instruction polarity			
Object Description		Object entry description	
properties	happen to	properties	happen to
index	$607E_h$	subindex	00_h
name (of a thing)	command polarity	Access Properties	rw
data structure	Variable	PDO Mapping Type	RPDO
data type	Unsigned8	Data range	0~1
operating mode		default value	0
1 Set the polarity of torque bit command, position command and speed command, when using, the polarity of speed, position and torque should be all 0 (Bit5~7 all 0) or 224 ((Bit5~7 all 1), after setting 607Eh, the servo needs to be re-powered to take effect.			

Bit	meaning
0	retain

1	retain
2	retain
3	retain
4	retain
5	Put the torque command 6071h/60B2h x (-1)
6	Put the speed command 60FFh/60B1h x (-1)
7	Put position command 607Ah/60B0h x (-1)

Object 607Fh :Maximum speed limit			
Object Description		Object entry description	
properties	happen to	properties	happen to
index	607Fh	subindex	00h
name (of a thing)	Maximum profile speed	Access Properties	rw
data structure	Variable	PDO Mapping Type	TPDO
data type	Unsigned32	Data range	0~4294967295
operating mode	PP/PV/PT/CSV/CST	default value	13107200
Maximum speed limit in PP/PV/PT/CSV/CST mode, in command units/S PP/PV/CSV mode, maximum speed limit is the lesser of 607Fh or 6080h PT/CST mode, maximum speed limit is the lesser of 607Fh, 6080h, internal speed limit (F05.29,F05.30)			

Object 6080h :Max. motor speed			
Object Description		Object entry description	
properties	happen to	properties	happen to
index	6080h	subindex	00h
name (of a thing)	Max. motor speed	Access Properties	rw
data structure	Variable	PDO Mapping Type	TPDO
data type	Unsigned32	Data range	0~4294967295
operating mode	ALL	default value	5000
6080h sets the maximum motor speed to protect the motor, valid in all modes: in Rpm/min 1. In speed mode, the maximum speed limit is the lesser of 607Fh or 6080h 2. In torque mode, the maximum speed limit is the lesser of 607Fh, 6080h, or internal speed limit (F05.29,F05.30) 3. In position mode, the maximum speed limit of PP mode is the smaller of 607Fh and 6080h The maximum speed limit in CSP mode is based on 6080h, and the servo internal function code F09.21 selects whether to set the 6080h limit or not. 1) CSP mode, when F09.21=0, 6080h does not do speed limit, exceeding the maximum speed will report Err.78 command exception fault 2) CSP mode, when F09.21 = 1, the motor runs at the maximum speed according to the 6080h setting			

Object 6081h :Profile speed			
Object Description		Object entry description	
properties	happen to	properties	happen to
index	6081h	subindex	00h

name (of a thing)	Contouring speed	Access Properties	rw
data structure	Variable	PDO Mapping Type	RPDO
data type	Unsigned32	Data range	0~4294967295
operating mode	PP	default value	0
Velocity in profile position mode when the displacement command is run at constant speed, unit: user command unit/S The actual speed of 6081h operation is limited by the smaller of 607F and 6080			

Object 6083h :Profile acceleration			
Object Description		Object entry description	
properties	happen to	properties	happen to
index	6083_h	subindex	00_h
name (of a thing)	Contour acceleration	Access Properties	rw
data structure	Variable	PDO Mapping Type	RPDO
data type	Unsigned32	Data range	0~4294967295
operating mode	PP/PV	default value	13107200
Operation panel F09.15 allows you to set the acceleration units. When 0. The meaning of the profile position mode is the acceleration in rpm/ms of the position given command corresponding to the motor acceleration from 0 rpm to 1000 rpm. The meaning of the profile speed mode is the acceleration in rpm/ms of the speed command as the motor accelerates from 0 rpm to 1000 rpm. When 1: for user command unit/S^2			

Object 6084h :Profile deceleration			
Object Description		Object entry description	
properties	happen to	properties	happen to
index	6084_h	subindex	00_h
name (of a thing)	Profile deceleration	Access Properties	rw
data structure	Variable	PDO Mapping Type	RPDO
data type	Unsigned32	Data range	0~4294967295
operating mode	ALL	default value	131072000
1. Operation panel F09.15 allows you to set the acceleration units. When 0: the meaning of the profile position mode is the acceleration in rpm/ms of the position given command corresponding to the deceleration of the motor from 1000 rpm to 0 rpm. The meaning of the profile speed mode is the deceleration rate in rpm/ms of the speed command as the motor decelerates from 1000 rpm to 0 rpm. When 1: for user command units / s2 2. In ALL mode operation, perform quick stop: set 605A=1 or 5, emergency stop both by 6084h for deceleration stop 3. Pause in ALL mode operation: set 605D=1, pause both by 6084h for deceleration stop 4. OFF stop in ALL mode operation: When F08.02=0, it is free stop; when F08.02=1 or 2, it is deceleration stop by 6084h			

Object 6085h :Fast stop deceleration

Object Description		Object entry description	
properties	happen to	properties	happen to
index	6085_h	subindex	00_h
name (of a thing)	Quick stop deceleration	Access Properties	rw
data structure	Variable	PDO Mapping Type	RPDO
data type	Unsigned32	Data range	0~4294967295
operating mode	ALL	default value	4294967295
1.F09.15 can set the acceleration unit. When 0: In rpm/ms, the deceleration rate of the motor when decelerating from 1000rpm to 0rpm when the 605Ah speed is stopped When 1: for user command units / s^2 2. Quick stop in ALL mode operation: set 605A=2,3,6,7 any one, emergency stop will be decelerated by 6085h setting value 3. Pause during ALL mode operation: set 605D=2, pause both at 6085h setting for deceleration stop			

Object 6087_h :Torque ramp			
Object Description		Object entry description	
properties	happen to	properties	happen to
index	6087_h	subindex	00_h
name (of a thing)	Torque ramp	Access Properties	rw
data structure	Variable	PDO Mapping Type	RPDO
data type	Unsigned32	Data range	0~4294967295
operating mode	PT/CST	default value	1000
Torque command acceleration in profile torque mode, in the sense of: torque command increment per second (in 1‰/s)			

Object $608F_h$:Position encoder resolution			
Object Description		Object entry description	
properties	happen to	properties	happen to
index	$608F_h$	subindex	00_h
name (of a thing)	Position encoder resolution	Access Properties	Ro
data structure	/	PDO Mapping Type	TPDO
data type	Unsigned8	Data range	0~2
operating mode	ALL	default value	2
properties	happen to	properties	happen to
index	$608F_h$	subindex	01_h
name (of a thing)	Motor encoder resolution	Access Properties	Rw
data structure	/	PDO Mapping Type	RPDO
data type	Unsigned32	Data range	1~4294967295
operating mode	ALL	default value	131072
properties	happen to	properties	happen to
index	$608F_h$	subindex	02_h
name (of a thing)	Motor resolution	Access Properties	Rw

	corresponds to the number of revolutions of the motor		
data structure	/	PDO Mapping Type	RPDO
data type	Unsigned32	Data range	1~4294967295
operating mode	ALL	default value	1
Interaction with 6091h and 6092h constitutes the electronic gear ratio, refer to 6091h electronic gear ratio for the specific relationship.			

Object 6091$_h$:Electronic gear ratio			
Object Description		Object entry description	
properties	happen to	properties	happen to
index	6091$_h$	subindex	00$_h$
name (of a thing)	Number of electronic gear ratio indexes	Access Properties	Rw
data structure	/	PDO Mapping Type	RPDO
data type	Unsigned8	Data range	0~512
operating mode	ALL	default value	2
properties	happen to	properties	happen to
index	6091$_h$	subindex	01$_h$
name (of a thing)	Electronic gear ratio: molecular	Access Properties	Rw
data structure	/	PDO Mapping Type	RPDO
data type	Unsigned32	Data range	1~4294967295
operating mode	ALL	default value	1
properties	happen to	properties	happen to
index	6091$_h$	subindex	02$_h$
name (of a thing)	Electronic gear ratio: denominator	Access Properties	Rw
data structure	/	PDO Mapping Type	RPDO
data type	Unsigned32	Data range	1~4294967295
operating mode	ALL	default value	1

Servo-electronic gear ratio = 608Fh* 6091h/6092h = $\dfrac{\dfrac{\text{608Fh : 01(电机编码器分辨率)}}{\text{608Fh : 02(编码器分分辨率对应电机转数)}} * \dfrac{\text{6091h : 01(电机旋转圈数)}}{\text{6091h : 02(驱动轴旋转圈数)}}}{\dfrac{\text{6092h : 01(上位进给量)}}{\text{6092h : 02(驱动轴旋转圈数)}}}$

Example: You need to set the upper command for 10000 drive axes to turn once, you can set 6091h(1:1)

6092h (10000:1)

Internal speed = 60FFh*6091h numerator*6092h denominator*60 /6091h denominator/6092h numerator, speed feedback is consistent with the command, F09.14 determines the unit of speed, 0: RPM, 1: user command/s,by 6091h,6092h determines the

unit of speed The YSK2-E servo drive offers 2 electronic gear ratio schemes, one with the default parameters inside the YSK2-E servo and the other with the 608Fh/ 6091h/ 6092h scheme enabled, both of which are switched via F09.13. When F09.13 is set to 0, 608Fh/ 6091h/ 6092h is not enabled . In this case, F01.09 and F04.00/F04.02 are active. When F09.13 is set to 1, 608Fh/ 6091h/ 6092h is enabled. at this point, F01.09 and F04.00/F04.02 do not work. Allowable range for gear ratio setting: encoder resolution/10000000 ≤ gear ratio ≤ encoder resolution/2.5 The final e-gear ratio can be confirmed as follows: F24.70 is set to 3, F24.71 and F24.72 show the low 16 bits and high 16 bits of the numerator of the final servo gear ratio, respectively, and F24.73 and F24.74 show the low 16 bits and high 16 bits of the denominator of the final servo gear ratio, respectively

Object 6092$_h$:Feed constants			
Object Description		Object entry description	
properties	happen to	properties	happen to
index	6092$_h$	subindex	00$_h$
name (of a thing)	Number of sub-indexes	Access Properties	Rw
data structure	/	PDO Mapping Type	RPDO
data type	Unsigned8	Data range	0~512
operating mode	ALL	default value	2
properties	happen to	properties	happen to
index	6092$_h$	subindex	01$_h$
name (of a thing)	Give in constants: molecule	Access Properties	Rw
data structure	/	PDO Mapping Type	RPDO
data type	Unsigned32	Data range	1~4294967295
operating mode	ALL	default value	131072 (17bit encoder)
properties	happen to	properties	happen to
index	6092$_h$	subindex	02$_h$
name (of a thing)	Give in constants: denominator	Access Properties	Rw
data structure	/	PDO Mapping Type	RPDO
data type	Unsigned32	Data range	1~4294967295
operating mode	ALL	default value	1
Interaction with 608Fh and 6091h constitutes the electronic gear ratio. For details refer to Object 6091$_h$:Electronic gear ratios			

Object 6093$_h$:position factor			
Object Description		Object entry description	
properties	happen to	properties	happen to
index	6093$_h$	subindex	00$_h$
name (of a thing)	Number of sub-indexes	Access Properties	Rw
data structure	/	PDO Mapping Type	RPDO

data type	Unsigned8	Data range	0~512
operating mode	ALL	default value	2
properties	happen to	properties	happen to
index	6093_h	subindex	01_h
name (of a thing)	Position factor: molecule	Access Properties	Rw
data structure	/	PDO Mapping Type	RPDO
data type	Unsigned32	Data range	1~4294967295
operating mode	ALL	default value	1
properties	happen to	properties	happen to
index	6092_h	subindex	02_h
name (of a thing)	Position factor: denominator	Access Properties	Rw
data structure	/	PDO Mapping Type	RPDO
data type	Unsigned32	Data range	1~4294967295
operating mode	ALL	default value	1
Reserved parameters			

Object 6094_h :Speed encoder factor			
Object Description		Object entry description	
properties	happen to	properties	happen to
index	6094_h	subindex	00_h
name (of a thing)	Number of sub-indexes	Access Properties	Rw
data structure	/	PDO Mapping Type	RPDO
data type	Unsigned8	Data range	0~512
operating mode	ALL	default value	2
properties	happen to	properties	happen to
index	6094_h	subindex	01_h
name (of a thing)	Velocity encoder factor: molecule	Access Properties	Rw
data structure	/	PDO Mapping Type	RPDO
data type	Unsigned32	Data range	1~4294967295
operating mode	ALL	default value	1
properties	happen to	properties	happen to
index	6094_h	subindex	02_h
name (of a thing)	Speed encoder factor: denominator	Access Properties	Rw
data structure	/	PDO Mapping Type	RPDO
data type	Unsigned32	Data range	1~4294967295
operating mode	ALL	default value	1
Reserved parameters			

Object 6095h :speed factor			
Object Description		Object entry description	
properties	happen to	properties	happen to
index	6095_h	subindex	00_h
name (of a thing)	Number of sub-indexes	Access Properties	Rw
data structure	/	PDO Mapping Type	RPDO
data type	Unsigned8	Data range	0~512
operating mode	ALL	default value	2
properties	happen to	properties	happen to
index	6095_h	subindex	01_h
name (of a thing)	Velocity factor: molecule	Access Properties	Rw
data structure	/	PDO Mapping Type	RPDO
data type	Unsigned32	Data range	1~4294967295
operating mode	ALL	default value	1
properties	happen to	properties	happen to
index	6095_h	subindex	02_h
name (of a thing)	Speed factor: denominator	Access Properties	Rw
data structure	/	PDO Mapping Type	RPDO
data type	Unsigned32	Data range	1~4294967295
operating mode	ALL	default value	1
Reserved parameters			

Object 6097h :acceleration factor			
Object Description		Object entry description	
properties	happen to	properties	happen to
index	6095_h	subindex	00_h
name (of a thing)	Number of sub-indexes	Access Properties	Rw
data structure	/	PDO Mapping Type	RPDO
data type	Unsigned8	Data range	0~512
operating mode	ALL	default value	2
properties	happen to	properties	happen to
index	6095_h	subindex	01_h
name (of a thing)	Acceleration factor: molecular	Access Properties	Rw
data structure	/	PDO Mapping Type	RPDO
data type	Unsigned32	Data range	1~4294967295
operating mode	ALL	default value	1
properties	happen to	properties	happen to

index	6092_h	subindex	02_h
name (of a thing)	Acceleration factor: denominator	Access Properties	Rw
data structure	/	PDO Mapping Type	RPDO
data type	Unsigned32	Data range	1~4294967295
operating mode	ALL	default value	1
Reserved parameters			

Object 6098_h :Back to original mode			
Object Description		Object entry description	
properties	happen to	properties	happen to
index	6098_h	subindex	00_h
name (of a thing)	return to original mode	Access Properties	rw
data structure	Variable	PDO Mapping Type	RPDO
data type	Integer8	Data range	0~35
operating mode	HM	default value	0
Thirty-one return methods are specified based on the home switch signal, limit switch signal, encoder Z signal, etc. See specifically0 Return to home mode			

Object 6099_h :Back to original speed			
Object Description		Object entry description	
properties	happen to	properties	happen to
index	6099_h	subindex	00_h
name (of a thing)	Number of sub-indexes	Access Properties	Rw
data structure	/	PDO Mapping Type	RPDO
data type	Unsigned8	Data range	0~512
operating mode	HM	default value	2
properties	happen to	properties	happen to
index	6099_h	subindex	01_h
name (of a thing)	Search for deceleration point signal speed in return to home mode	Access Properties	Rw
data structure	/	PDO Mapping Type	RPDO
data type	Unsigned32	Data range	1~4294967295
operating mode	HM	default value	218453
properties	happen to	properties	happen to
index	6099_h	subindex	02_h
name (of a thing)	Search for home switch signal speed in return home mode	Access Properties	Rw

data structure	/	PDO Mapping Type	RPDO
data type	Unsigned32	Data range	1~4294967295
operating mode	HM	default value	21845
F09.14 allows you to set the speed unit type, when 1 the speed unit is user command/S, when 0 it is rpm. 2 speeds during return to home mode, 6099.01h speed can be set to a higher value for fast pre-determination and 6099.02h can be set to a lower speed for precise positioning			

Object 609A$_h$:Back to original acceleration			
Object Description		Object entry description	
properties	happen to	properties	happen to
index	609A$_h$	subindex	00$_h$
name (of a thing)	return to original acceleration	Access Properties	Rw
data structure	Variable	PDO Mapping Type	RPDO
data type	unsigned32	Data range	0~4294967295
operating mode	HM	default value	1310720
F09.15 allows you to set the speed unit type, when it is 1 the speed unit is user command/S, when it is 0 it is rpm. Set acceleration and deceleration in home return to zero mode When F09.15 = 0, the meaning is the acceleration time of the motor when accelerating from 0rpm to 1000rpm, ms			

Object 60B0$_h$:Position Offset			
Object Description		Object entry description	
properties	happen to	properties	happen to
index	60B0$_h$	subindex	00$_h$
name (of a thing)	position offset	Access Properties	Rw
data structure	Variable	PDO Mapping Type	RPDO
data type	Integer32	Data range	-2147483648~2147483647
operating mode	CSP	default value	0
Set the position offset in synchronous cycle position mode, servo target position = 607Ah + 60B0h			

Object 60B1$_h$:Velocity Offset			
Object Description		Object entry description	
properties	happen to	properties	happen to
index	60B1$_h$	subindex	00$_h$
name (of a thing)	speed offset	Access Properties	Rw
data structure	Variable	PDO Mapping Type	RPDO
data type	Integer32	Data range	-2147483648~2147483647
operating mode	CSV	default value	0
Set the velocity offset in synchronous cycle velocity mode, servo target velocity = 60FFh + 60B1h			

Object 60B2$_h$:Torque Offset

Object Description		Object entry description	
properties	happen to	properties	happen to
index	$60B2_h$	subindex	00_h
name (of a thing)	Torque Shift	Access Properties	Rw
data structure	Variable	PDO Mapping Type	RPDO
data type	Integer32	Data range	-32768~32767
operating mode	CSP/CSV/CST	default value	0
Set the torque offset in synchronous cycle torque mode, servo target torque = 6071h + 60B2h			

Object $60B8_h$:Probe function			
Object Description		Object entry description	
properties	happen to	properties	happen to
index	$60B8_h$	subindex	00_h
name (of a thing)	Probe Function	Access Properties	Rw
data structure	Variable	PDO Mapping Type	RPDO
data type	Unsigned16	Data range	0~65535
operating mode	/	default value	0

The servo internal parameter F09.27 allows you to select the probe function type, corresponding to the 60B9h probe function status word

Some of the DI signals and Z signals are too narrow, and the servo does not ensure that it can capture all rising and falling edge signals. So please note when using.

1. In the case of the same probe, try to avoid using both rising and falling edges
2. When using the Z signal, only the rising edge, not the falling edge, can be used

Bit	instructions	
	F09.27 = 0	F09.27 = 1
0	Probe 1 enable 0: Does not enable the probe 1 1: Enabling Probe 1	Probe 1 enable 0: Does not enable the probe 1 1: Enabling Probe 1
1	Probe 1 trigger mode 0: Single trigger 1: Continuous trigger	Probe 1 trigger mode 0: Single trigger 1: Continuous trigger
2	Probe 1 trigger signal selection 0: DI4 trigger 1: Z-signal trigger	Probe 1 trigger signal selection 0: DI4 trigger 1: Z-signal trigger
3	retain	retain
4	Probe 1 rising edge latch 0: Probe 1 rising edge latch is not used 1: Use probe 1 rising edge latch	Probe 1 rising edge latch 0: Probe 1 rising edge latch is not used 1: Use probe 1 rising edge latch
5	Probe 1 falling edge latch 0: Probe 1 falling edge latch is not used 1: Use Probe 1 falling edge latch	Probe 1 falling edge latch 0: Probe 1 falling edge latch is not used 1: Use Probe 1 falling edge latch
6~7	retain	retain

8	Probe 2 enable 0: Does not enable the probe 2 1: Enabling Probe 2	Probe 2 enable 0: Does not enable the probe 2 1: Enabling Probe 2
9	Probe 2 trigger mode 0: Single trigger 1: Continuous trigger	Probe 2 trigger mode 0: Single trigger 1: Continuous trigger
10	Probe 2 trigger signal selection 0: DI5 trigger 1: Z-signal trigger	Probe 2 trigger signal selection 0: DI5 trigger 1: Z-signal trigger
11	retain	retain
12	Probe 2 rising edge latch 0: Probe 2 rising edge latch is not used 1: Use Probe 2 rising edge latch	Probe 2 rising edge latch 0: Probe 2 rising edge latch is not used 1: Use Probe 2 rising edge latch
13	Probe 2 falling edge latch 0: Probe 2 falling edge latch is not used 1: Use Probe 2 falling edge latch	Probe 2 falling edge latch 0: Probe 2 falling edge latch is not used 1: Use Probe 2 falling edge latch
14~15	retain	retain

Object 60B9$_h$:Probe status word			
Object Description		Object entry description	
properties	happen to	properties	happen to
index	60B9$_h$	subindex	00$_h$
name (of a thing)	Probe Status Word	Access Properties	Ro
data structure	Variable	PDO Mapping Type	TPDO
data type	Unsigned16	Data range	0~65535
operating mode	/	default value	0

The servo internal parameter F09.27 allows you to select the probe status word type, corresponding to the 60B8h probe function

<table>
<tr><td rowspan="2">Bit</td><td colspan="2">instructions</td></tr>
<tr><td>F09.27 = 0</td><td>F09.27 =0</td></tr>
<tr><td>0</td><td>Probe 1 enable
0: Does not enable the probe 1
1: Enabling Probe 1</td><td>Probe 1 enable
0: Does not enable the probe 1
1: Enabling Probe 1</td></tr>
<tr><td>1</td><td>Probe 1 rising edge latch
0: Probe 1 rising edge latch not executed 1: Probe 1 rising edge latch executed</td><td>Probe 1 rising edge latch
0: Probe 1 rising edge latch not executed 1: Probe 1 rising edge latch executed</td></tr>
<tr><td>2</td><td>Probe 1 falling edge latch
0: Probe 1 falling edge latch not performed
1: Probe 1 falling edge latching has been executed</td><td>Probe 1 falling edge latch
0: Probe 1 falling edge latch not performed
1: Probe 1 falling edge latching has been executed</td></tr>
<tr><td>3~5</td><td>retain</td><td>retain</td></tr>
<tr><td>6</td><td>Probe 1 trigger signal selection
0: DI4 trigger
1: Z-signal trigger</td><td>retain</td></tr>
<tr><td>7</td><td>Probe 1 triggers DI level selection
0: DI4 low level trigger
1: DI4 high level trigger</td><td>retain</td></tr>
<tr><td>8</td><td>Probe 2 enable
0: Does not enable the probe 2
1: Enabling Probe 2</td><td>Probe 2 enable
0: Does not enable the probe 2
1: Enabling Probe 2</td></tr>
<tr><td>9</td><td>Probe 2 rising edge latch
0: Probe 2 rising edge latch not performed
1: Probe 2 rising edge latching has been executed</td><td>Probe 2 rising edge latch
0: Probe 2 rising edge latch not performed
1: Probe 2 rising edge latching has been executed</td></tr>
<tr><td>10</td><td>Probe 2 falling edge latch
0: Probe 2 falling edge latch not performed
1: Probe 2 falling edge latching has been executed</td><td>Probe 2 falling edge latch
0: Probe 2 falling edge latch not performed
1: Probe 2 falling edge latching has been executed</td></tr>
<tr><td>11~13</td><td>retain</td><td>retain</td></tr>
<tr><td>14</td><td>Probe 2 trigger signal selection
0: DI5 trigger 1: Z signal trigger</td><td>retain</td></tr>
<tr><td>15</td><td>Probe 2 trigger DI level selection
0: DI5 low level trigger 1: DI5 high level trigger</td><td>retain</td></tr>
</table>

<table>
<tr><td colspan="4">Object 60BA_h :Probe 1 rising edge position feedback</td></tr>
<tr><td colspan="2">Object Description</td><td colspan="2">Object entry description</td></tr>
<tr><td>properties</td><td>happen to</td><td>properties</td><td>happen to</td></tr>
<tr><td>index</td><td>60BAh</td><td>subindex</td><td>00h</td></tr>
<tr><td>name (of a thing)</td><td>Probe 1 rising edge position feedback</td><td>Access Properties</td><td>Ro</td></tr>
<tr><td>data structure</td><td>Variable</td><td>PDO Mapping Type</td><td>TPDO</td></tr>
<tr><td>data type</td><td>Integer32</td><td>Data range</td><td>-2147483648~2147483647</td></tr>
<tr><td>operating mode</td><td>/</td><td>default value</td><td>0</td></tr>
</table>

Record the position command when the rising edge of Probe 1 is active (command unit, 6062h)

Object $60BB_h$:Probe 1 falling edge position feedback			
Object Description		Object entry description	
properties	happen to	properties	happen to
index	$60BB_h$	subindex	00_h
name (of a thing)	Probe 1 falling edge position feedback	Access Properties	Ro
data structure	Variable	PDO Mapping Type	TPDO
data type	Integer32	Data range	-2147483648~2147483647
operating mode	/	default value	0
Record the position command when the falling edge of Probe 1 is active (command unit, 6062h)			

Object $60BC_h$:Probe 2 rising edge position feedback			
Object Description		Object entry description	
properties	happen to	properties	happen to
index	$60BC_h$	subindex	00_h
name (of a thing)	Probe 2 rising edge position feedback	Access Properties	Ro
data structure	Variable	PDO Mapping Type	TPDO
data type	Integer32	Data range	-2147483648~2147483647
operating mode	/	default value	0
Record the position command when the rising edge of Probe 2 is active (command unit, 6062h)			

Object $60BD_h$:Probe 2 falling edge position feedback			
Object Description		Object entry description	
properties	happen to	properties	happen to
index	$60BD_h$	subindex	00_h
name (of a thing)	Probe 2 falling edge position feedback	Access Properties	Ro
data structure	Variable	PDO Mapping Type	TPDO
data type	Integer32	Data range	-2147483648~2147483647
operating mode	/	default value	0
Record the position command when the falling edge of probe 2 is active (command unit, 6062h)			

Object $60C0_h$:Interpolation submodular selection			
Object Description		Object entry description	
properties	happen to	properties	happen to
index	$60C0_h$	subindex	00_h
name (of a thing)	Interpolation submodule selection	Access Properties	Rw

data structure	Variable	PDO Mapping Type	RPDO
data type	Integer16	Data range	-32768~32767
operating mode	IP	default value	0

Interpolation curve selection in position interpolation mode

assign a value to	Interpolation mode
-32768~-1	Manufacturer's definition, not yet available
0	linear interpolation
1~32767	retain

Object 60C1$_h$:Interpolation data record			
Object Description		Object entry description	
properties	happen to	properties	happen to
index	60C1$_h$	subindex	00$_h$
name (of a thing)	Number of sub-indexes	Access Properties	Rw
data structure	/	PDO Mapping Type	RPDO
data type	Unsigned8	Data range	0~512
operating mode	IP	default value	1
properties	happen to	properties	happen to
index	60C1$_h$	subindex	01$_h$
name (of a thing)	Interpolation displacement	Access Properties	Rw
data structure	/	PDO Mapping Type	RPDO
data type	Integer32	Data range	-2147483648~2147483647
operating mode	IP	default value	0

Interpolation position mode position command, interpolation displacement is absolute displacement command, each time the synchronization cycle comes, the upper computer sends a displacement command to the slave. Unit:p/s

Object 60C2$_h$:interpolation period			
Object Description		Object entry description	
properties	happen to	properties	happen to
index	6099$_h$	subindex	00$_h$
name (of a thing)	Number of sub-indexes	Access Properties	Rw
data structure	/	PDO Mapping Type	RPDO
data type	Unsigned8	Data range	0~512
operating mode	IP	default value	2

properties	happen to	properties	happen to
index	$60C2_h$	subindex	01_h
name (of a thing)	Interpolation time units	Access Properties	Rw
data structure	/	PDO Mapping Type	RPDO
data type	Unsigned8	Data range	0~512
operating mode	IP	default value	1
Set the interpolation period in interpolation position mode (unit: ms) 60C2.01h is the time constant of the interpolation cycle, which is the actual interpolation cycle time parameter (ms)			
properties	happen to	properties	happen to
index	$60C2_h$	subindex	02_h
name (of a thing)	Interpolated time index	Access Properties	Rw
data structure	/	PDO Mapping Type	RPDO
data type	Integer8	Data range	-255~255
operating mode	IP	default value	-3
60C2.02h is the unit of interpolation cycle time, -3 represents the unit of time in ms			

Object $60C5_h$:Maximum profile acceleration			
Object Description		Object entry description	
properties	happen to	properties	happen to
index	$60C5_h$	subindex	00_h
name (of a thing)	Maximum profile acceleration	Access Properties	Rw
data structure	Variable	PDO Mapping Type	RPDO
data type	Unsigned32	Data range	0~4294967295
operating mode	PP/PV/HM	default value	1000000000
F09.15 allows you to set the acceleration units that When 0: Acceleration of the displacement command acceleration segment in contour position/contour velocity mode. The meaning is to set the maximum allowable acceleration of the acceleration segment in the contour position mode, contour velocity mode, and home return to zero mode, limited to 6083h. Meaning is the maximum acceleration in rpm/ms as the motor accelerates from 0rpm to 1000rpm When 1: is the user command unit/S^			

Object $60C6_h$:Maximum profile deceleration			
Object Description		Object entry description	
properties	happen to	properties	happen to
index	$60C6_h$	subindex	00_h
name (of a thing)	Maximum profile deceleration	Access Properties	Rw

data structure	Variable	PDO Mapping Type	RPDO
data type	Unsigned32	Data range	0~4294967295
operating mode	PP/PV/HM	default value	1000000000

F09.15 allows you to set the acceleration units that

When 0: Deceleration speed of displacement command deceleration segment in contour position/contour velocity mode. The meaning is to set the maximum allowable deceleration speed of the acceleration segment in the contour position mode, contour velocity mode, and home return to zero mode, limited to 6084h.

Meaning is the maximum deceleration in rpm/ms as the motor decelerates from 1000 rpm to 0 rpm

When 1: for user command unit/S^2

Object 60E0$_h$:Forward maximum torque limit			
Object Description		Object entry description	
properties	happen to	properties	happen to
index	60E0$_h$	subindex	00$_h$
name (of a thing)	Forward maximum torque limit	Access Properties	Rw
data structure	Variable	PDO Mapping Type	RPDO
data type	Unsigned16	Data range	0~65535
operating mode	ALL	default value	10000
Limits the maximum forward torque limit of the servo in 0.1%.			

Object 60E1$_h$:Maximum torque limit in the negative direction			
Object Description		Object entry description	
properties	happen to	properties	happen to
index	60E1$_h$	subindex	00$_h$
name (of a thing)	Maximum torque limit in the negative direction	Access Properties	Rw
data structure	Variable	PDO Mapping Type	RPDO
data type	Unsigned16	Data range	0~65535
operating mode	ALL	default value	10000
Limits the maximum negative torque limit of the servo, in 0.1%			

Object 60F2$_h$: Positioning option code			
Object Description		Object entry description	
properties	happen to	properties	happen to
index	60F2$_h$	subindex	00$_h$
name (of a thing)	Positioning option code	Access Properties	Rw
data structure	Variable	PDO Mapping Type	RPDO
data type	Unsigned16	Data range	0~65535
operating mode	PP/IP	default value	0
Reserved functions			

Object 60F4h :User position deviation			
Object Description		Object entry description	
properties	happen to	properties	happen to
index	60F4h	subindex	00h
name (of a thing)	User position deviation	Access Properties	Ro
data structure	Variable	PDO Mapping Type	TPDO
data type	Integer32	Data range	-2147483648~2147483647
operating mode	PP/HM/CSP	default value	0
Reflects real-time position deviation (user position units)			

Object 60F8h :max slippage			
Object Description		Object entry description	
properties	happen to	properties	happen to
index	60F8h	subindex	00h
name (of a thing)	Maximum sliding	Access Properties	Ro
data structure	Variable	PDO Mapping Type	RPDO
data type	Integer32	Data range	-2147483648~2147483647
operating mode	PV	default value	1000000000
Monitor whether the maximum slip is reached, asynchronous motors with			

Object 60FCh :Motor position command feedback			
Object Description		Object entry description	
properties	happen to	properties	happen to
index	60FCh	subindex	00h
name (of a thing)	Motor position command feedback	Access Properties	Ro
data structure	Variable	PDO Mapping Type	TPDO
data type	Integer32	Data range	0~4294967295
operating mode	PP/HM/CSP	default value	0
Reflects real-time motor position commands User position command (6062h) × position factor (6093h) = motor position command 60FCh (encoder unit)			

Object 60FDh :DI input status			
Object Description		Object entry description	
properties	happen to	properties	happen to
index	60FDh	subindex	00h
name (of a thing)	DI input status	Access Properties	Ro
data structure	Variable	PDO Mapping Type	TPDO
data type	Unsigned32	Data range	0~4294967295
operating mode	ALL	default value	33488899 (1 1111 1111 0000 0000 0000 0011)

Display of DI input status	
Bit	meaning
0	Negative limit switch (DI function code 16 of the driver, defaults to 1 when no level is entered)
1	Positive limit switch (DI function code 15 of the drive, defaults to 1 when no level is entered)
2	Home switch (DI function code 28 of the driver, defaults to 0 when no level is entered)
3~9	Reserved (default is low, i.e., 0)
10	Z pulse (no setting required)
11	External DI input 1: Probe function 1 (DI function code 39)
12	External DI input 2: Probe function 2 (DI function code 40)
13	Emergency stop (DI function code 30)
16	Corresponds to DI1 (F06.01) terminal logic and function selection, defaults to 1 when no level is input
17	Corresponds to DI2 (F06.02) terminal logic and function selection, defaults to 1 when no level is input
18	Corresponds to DI3 (F06.03) terminal logic and function selection, defaults to 1 when no level is input
19	Corresponds to DI4 (F06.04) terminal logic and function selection, defaults to 1 when no level is input
20	Corresponds to DI5 (F06.05) terminal logic and function selection, defaults to 1 when no level is entered
21~31	Reserved (default is low, i.e., 0)

Object 60FE$_h$:Force DO output			
Object Description		Object entry description	
properties	happen to	properties	happen to
index	60FE$_h$	subindex	00$_h$
name (of a thing)	Number of sub-indexes	Access Properties	Rw
data structure	/	PDO Mapping Type	RPDO
data type	Unsigned8	Data range	0~512
operating mode	ALL	default value	2
properties	happen to	properties	happen to
index	60FE$_h$	subindex	01$_h$
name (of a thing)	Forced DO output status	Access Properties	Rw
data structure	/	PDO Mapping Type	RPDO
data type	Unsigned32	Data range	0~4294967295
operating mode	ALL	default value	0
properties	happen to	properties	happen to
index	60FE$_h$	subindex	02$_h$
name (of a thing)	bit shield	Access Properties	Rw
data structure	/	PDO Mapping Type	RPDO

data type	Unsigned32	Data range	0~4294967295
operating mode	ALL	default value	0

This function can force DO output, YSK2-E EtherCAT servo supports DO1~DO9

Bit	meaning
0	retain
1~15	retain
16~24	Forced DO output

1. Steps for using the method: e.g. forced DO1~DO2 output function

Enable the forced DO1~DO2 function, set 60FEh-02h=196608 (11 0000 0000 0000 0000)

Forced output DO1~DO2 is valid, set 60FEh-01h=196608 (11 0000 0000 0000 0000)

Object 60FFh :Target Speed			
Object Description		Object entry description	
properties	happen to	properties	happen to
index	60FFh	subindex	00h
name (of a thing)	Target speed	Access Properties	rw
data structure	Variable	PDO Mapping Type	RPDO
data type	Integer32	Data range	-2147483648~2147483647
operating mode	PV/CSV	default value	0
User speed command in set profile speed/synchronous cycle speed mode			

Object 6502h :Support servo operation mode			
Object Description		Object entry description	
properties	happen to	properties	happen to
index	6502h	subindex	00h
name (of a thing)	Supports servo operation mode	Access Properties	ro
data structure	Variable	PDO Mapping Type	TPDO
data type	Unsigned32	Data range	0~4294967295
operating mode	ALL	default value	1005

Displays the servo operation modes supported by the drive

Bit	meaning	
0	Profile Position Mode (PP)	Support, refer to0 Section
1	speed mode	No support
2	Profile Velocity Mode (PV)	support, refer to0 Section
3	Profile Torque Mode (PT)	support, refer to0 Section
4	retain	
5	Back to Original Mode (HM)	support, refer to0 Section
6	Interpolation Position Mode (IP)	
7	Cyclic Synchronous Position Mode (CSP)	support, refer to0 Section

8	Cycle Synchronous Bit Velocity Mode (CSV)	Support, refer to0 Section
9	Cyclic Synchronous Torque Mode (CST)	Support, refer to0 Section
10~31	retain	

11.4 Dedicated parameters for Profinet servo

Group F14 PN communication parameters

F14.00	Physical NIC address1	Setting range	Factory value	Unit	Effective method	Related Models		
		0000H ~ FFFFH	2048	--	Downtime effective	P	S	T

0 ~ 65535

F14.01	Physical NIC address 2	Setting range	Factory value	Unit	Effective method	Related Models		
		0000H ~ FFFFH	1538	--	Downtime effective	P	S	T

0 ~ 65535

F14.02	Physical NIC address3	Setting range	Factory value	Unit	Effective method	Related Models		
		0000H ~ FFFFH	0	--	Downtime effective	P	S	T

0 ~ 65535

F14.04	The 1st and 2nd characters of the device name	Setting range	Factory value	Unit	Effective method	Related Models		
		0000H ~ FFFFH	22099	--	Downtime effective	P	S	T

0 ~ 65535

F14.05	The 3rd and 4th characters of the device name	Setting range	Factory value	Unit	Effective method	Related Models		
		0000H ~ FFFFH	13616	--	Downtime	P	S	T

					effective			

0 ~ 65535

F14.06	The 5th and 6th characters of the device name	Setting range	Factory value	Unit	Effective method	Related Models		
		0000H ~ FFFFH	12356	--	Downtime effective	P	S	T

0 ~ 65535

F14.07	The seventh and eighth characters of the device name	Setting range	Factory value	Unit	Effective method	Related Models		
		0000H ~ FFFFH	12337	--	Downtime effective	P	S	T

0 ~ 65535

F14.08	Equipment IPA	Setting range	Factory value	Unit	Effective method	Related Models		
		0000H ~ FFFFH	49320	--	Downtime effective	P	S	T

0 ~ 65535

F14.09	Equipment IPB	Setting range	Factory value	Unit	Effective method	Related Models		
		0000H ~ FFFFH	88	--	Downtime effective	P	S	T

0 ~ 65535

F14.10	Device Network Mask A	Setting range	Factory value	Unit	Effective method	Related Models		
		0000H ~ FFFFH	65535	--	Downtime effective	P	S	T

0 ~ 65535

F14.11	Device Network Mask B	Setting range	Factory value	Unit	Effective method	Related Models		
		0000H ~ FFFFH	65280	--	Downtime effective	P	S	T

0 ~ 65535

F14.12	Network Manager A	Setting range	Factory value	Unit	Effective method	Related Models		
		0000H ~ FFFFH	0	--	Downtime effective	P	S	T

0 ~ 65535

F14.13	Network Manager B	Setting range	Factory value	Unit	Effective method	Related Models		
		0000H ~ FFFFH	0	--	Downtime effective	P	S	T

0 ~ 65535

F14.14	Data write switch	Setting range	Factory value	Unit	Effective method	Related Models		
		0000H ~ FFFFH	0	--	Downtime effective	P	S	T

0 ~ 65535

F14.15	922 message monitoring	Setting range	Factory value	Unit	Effective method	Related Models		
		0 ~ 65535	0	--	Display only	P	S	T

0 ~ 65535

F14.16	Additional message monitoring	Setting range	Factory value	Unit	Effective method	Related Models		
		0 ~ 65535	0	--	Display only	P	S	T

0 ~ 65535

F14.17	925 Heartbeat Alarm Threshold	Setting range	Factory value	Unit	Effective method	Related Models		
		0 ~ 65535	5	--	Effective immediately	P	S	T

0 ~ 65535

F14.18	944 Fault message counter	Setting range	Factory value	Unit	Effective method	Related Models		
		0 ~ 65535	0	--	Display only	P	S	T

0 ~ 65535

F14.19	947 fault number	Setting range	Factory value	Unit	Effective method	Related Models		
		0 ~ 65535	0	--	Display only	P	S	T

0 ~ 65535

F14.20	Fault serial number	Setting range	Factory value	Unit	Effective method	Related Models		
		0 ~ 65535	0	--	Display only	P	S	T

0 ~ 65535

F14.21	952 Fault status counter	Setting range	Factory value	Unit	Effective method	Related Models		
		0 ~ 65535	0	--	Display only	P	S	T

0 ~ 65535

F14.22	979_0 Sensor head (32 bits)	Setting range	Factory value	Unit	Effective method	Related Models		
		0 ~ 2147483647	0	--	Display only	P	S	T

0 ~ 2147483647

F14.24	979_1 Sensor type (32 bits)	Setting range	Factory value	Unit	Effective method	Related Models		
		0 ~ 2147483647	0	--	Display only	P	S	T

0 ~ 2147483647

F14.26	979_2 Sensor resolution (32 bits)	Setting range	Factory value	Unit	Effective method	Related Models		
		0 ~ 2147483647	0	--	Display only	P	S	T

0 ~ 2147483647

F14.28	979_3 Sensor G1_XIST1 factor (32 bits)	Setting range	Factory value	Unit	Effective method	Related Models		
		0 ~ 2147483647	15	--	Power up again	P	S	T

0 ~ 2147483647

F14.30	979_4 sensor G1_XIST2 factor (32 bits)	Setting range	Factory value	Unit	Effective method	Related Models		
		0 ~ 2147483647	15	--	Power up again	P	S	T

0 ~ 2147483647

F14.32	979_5 sensor multi-turn (32 bits)	Setting range	Factory value	Unit	Effective method	Related Models		
		0 ~ 2147483647	0	--	Downtime effective	P	S	T

0 ~ 2147483647

F14.34	Synchronization cycle	Setting range	Factory value	Unit	Effective method	Related Models		
		0 ~ 65535	0	--	Display only	P	S	T

0 ~ 65535

F14.35	FPGA synchronization detection threshold	Setting range	Factory value	Unit	Effective method	Related Models		
		0 ~ 65535	0	--	Downtime effective	P	S	T

0 ~ 65535

F14.36	Speed ramp on flag 1=not on 0=on	Setting range	Factory value	Unit	Effective method	Related Models		
		0 ~ 65535	1	--	Downtime effective		S	

0 ~ 1

F14.37	Update Now Switch	Setting range	Factory value	Unit	Effective method	Related Models		
		0 ~ 65535	0	--	Downtime effective	P		

0 ~ 1

F14.40	Disengage To control servo local acceleration time (32 bits)	Setting range	Factory value	Unit	Effective method	Related Models		
		0 ~ 200000	10	--	Effective immediately		S	

0 ~ 2147483647

F14.42	Disengage To control servo local deceleration time (32 bits)	Setting range	Factory value	Unit	Effective method	Related Models		
		0 ~ 200000	10	--	Effective immediately		S	

0 ~ 2147483647

F14.44	Deceleration time in speed mode (acceleration time in units of 0-1000RPM: ms)(32 bits)	Setting range	Factory value	Unit	Effective method	Related Models		
		0 ~ 200000	0	--	Downtime		S	

					effective			

0 ~ 200000

F14.46	bit10 Hysteresis judgment value (RPM)	Setting range	Factory value	Unit	Effective method	Related Models		
		0 ~ 3000	300	0.1	Downtime effective		S	

0 ~ 30000

F14.47	N4 speed error range (RPM)	Setting range	Factory value	Unit	Effective method	Related Models		
		0 ~ 65535	5	--	Downtime effective	P	S	T

0 ~ 65535

F14.48	Speed error range time (ms)	Setting range	Factory value	Unit	Effective method	Related Models		
		0 ~ 65535	5	--	Downtime effective	P	S	T

1 ~ 65535

F14.49	ARM and 200P dropout detection function control switch	Setting range	Factory value	Unit	Effective method	Related Models		
		0 ~ 1	0	--	Downtime effective	P	S	T

0 ~ 1

F14.50	Whether the synchronization period is a current loop multiplier detection switch	Setting range	Factory value	Unit	Effective method	Related Models		
		0 ~ 1	0	--	Downtime effective	P	S	T

0 ~ 1

F14.51	Test variables test IRT mode	Setting range	Factory value	Unit	Effective method	Related Models		
		0 ~ 2	0	--	Downtime effective	P	S	T

0 ~ 2

Group F15 PN basic positioner settings

F15.00	Maximum speed (32 bits)	Setting range	Factory value	Unit	Effective method	Related Models		
		1 to 80000000	50000000	1LU/min	Downtime effective	P		

1 to 80000000

F15.02	Maximum acceleration (32 bits)	Setting range	Factory value	Unit	Effective method	Related Models		
		1 to 200000000	5,000,000	1LU/min/s	Downtime effective	P		

1 to 200000000

F15.04	Maximum deceleration (32 bits)	Setting range	Factory value	Unit	Effective method	Related Models		
		1 to 200000000	5,000,000	1LU/min/s	Downtime effective	P		

1 to 200000000

F15.06	Maximum ramp speed (32 bits)	Setting range	Factory value	Unit	Effective method	Related Models		
		1 to 200000000	5,000,000	1LU/min/s	Downtime effective	P		

1 to 200000000

F15.08	Position Deviation Excess Threshold (32 bits)	Setting range	Factory value	Unit	Effective method	Related Models		
		0 ~ 2147483647	40000	--	Downtime effective	P		

0 ~ 2147483647

F15.10	Position reach threshold (32	Setting range	Factory	Unit	Effective	Related

	bits)		value		method	Models		
		0 ~ 2147483647	100	--	Downtime effective	P		

0 ~ 2147483647

F15.12	Location arrival window (32 bits)	Setting range	Factory value	Unit	Effective method	Related Models		
		0 ~ 100000	0	--	Downtime effective	P		

0 ~ 100000ms

F15.14	JOG Speed 1 (32-bit)	Setting range	Factory value	Unit	Effective method	Related Models		
		-40000000 ~ 40000000	-300000	1LU/min	Effective immediately	P	S	

-40000000 ~ 40000000

F15.16	JOG Speed 2 (32-bit)	Setting range	Factory value	Unit	Effective method	Related Models		
		-40000000 ~ 40000000	300000	1LU/min	Effective immediately	P	S	

-40000000 ~ 40000000

F15.18	JOG maximum acceleration (32 bits)	Setting range	Factory value	Unit	Effective method	Related Models		
		1 ~ 1073741824	100000	1LU/min/s	Effective immediately	P	S	

1 ~ 1073741824

F15.20	JOG maximum deceleration (32 bits)	Setting range	Factory value	Unit	Effective method	Related Models		
		1 ~ 1073741824	100000	1LU/min/s	Effective immediately	P	S	

1 ~ 1073741824

F15.22	Origin regression type	Setting range	Factory value	Unit	Effective method	Related Models		
		0 ~ 35	1	--	Effective immediately	P		

0 to 34

F15.23	Origin return high-speed speed (32-bit)	Setting range	Factory value	Unit	Effective method	Related Models		
		0 ~ 40000000	5,000,000	1LU/min	Effective immediately	P		

0 ~ 40000000

F15.25	Home return low speed (32 bit)	Setting range	Factory value	Unit	Effective method	Related Models		
		0 ~ 40000000	30,000	1LU/min	Effective immediately	P		

0 ~ 40000000

F15.27	Home return acceleration and deceleration time (32 bits)	Setting range	Factory value	Unit	Effective method	Related Models		
		0 ~ 200000000	100000	1LU/min /s	Effective immediately	P		

1 to 200000000

F15.29	Home Return Relative Offset (32 bits)	Setting range	Factory value	Unit	Effective method	Related Models		
		-1073741824 ~ 1073741824	0	--	Effective immediately	P		

-1073741824 ~ 1073741824

F15.31	Absolute offset of origin	Setting range	Factory	Unit	Effective	Related

	regression (32 bits)		value		method	Models		
		-1073741824 ~ 1073741824	0	--	Effective immediately	P		

-1073741824 ~ 1073741824

F15.33	Reference coordinate value (32 bits)	Setting range	Factory value	Unit	Effective method	Related Models		
		-1073741824 ~ 1073741824	0	--	Effective immediately	P		

-1073741824 ~ 1073741824

F15.35	Home return timeout (32 bits)	Setting range	Factory value	Unit	Effective method	Related Models		
		0 ~ 2147483647	60,000	1ms	Effective immediately	P		

0 ~ 2147483647ms

F15.37	Soft limit effective method	Setting range	Factory value	Unit	Effective method	Related Models		
		0 to 3	0	--	Effective immediately	P		

0 to 3

F15.38	Soft limit positive limit value (32 bits)	Setting range	Factory value	Unit	Effective method	Related Models		
		-2147483648 ~ 2147483647	2147483647	--	Effective immediately	P		

-1073741824 ~ 1073741824

F15.40	Soft limit negative limit value (32 bits)	Setting range	Factory value	Unit	Effective method	Related Models		
		-2147483648 ~ 2147483647	-2147483648	--	Effective immediately	P		

-1073741824 ~ 1073741824

F15.42	Electronic gear ratio molecule (32 bits)	Setting range	Factory value	Unit	Effective method	Related Models		
		1 ~ 1073741824	1	--	Effective immediately	P		

1 ~ 1073741824

F15.44	Electronic gear score denominator (32 bits)	Setting range	Factory value	Unit	Effective method	Related Models		
		1 ~ 1073741824	1	--	Effective immediately	P		

1 ~ 1073741824

F15.46	s111 message send content	Setting range	Factory value	Unit	Effective method	Related Models		
		0 to 3	0	--	Downtime effective	P		

0 to 3

F15.47	s111 message upload content	Setting range	Factory value	Unit	Effective method	Related Models		
		0 to 3	0	--	Downtime effective	P		

0 to 3

F15.48	Low upper limit of modal axis pulse (32 bits)	Setting range	Factory value	Unit	Effective method	Related Models		
		0 ~ 1073741824	36000	--	Downtime effective	P		

0 ~ 1073741824

F15.50	Upper limit of modal axis	Setting range	Factory	Unit	Effective	Related

	pulse height (32 bits)		value		method	Models		
		0 ~ 1073741824	0	--	Downtime effective	P		

0 ~ 1073741824

F15.52	Modal axis on switch	Setting range	Factory value	Unit	Effective method	Related Models		
		0 ~ 1	0	--	Downtime effective	P		

0 ~ 1

F15.53	Non-cyclic data saving switch	Setting range	Factory value	Unit	Effective method	Related Models		
		0 ~ 1	1	--	Downtime effective	P		

0 ~ 1

F15.54	Mobile Signal Output Threshold	Setting range	Factory value	Unit	Effective method	Related Models		
		0 ~ 6000	3	--	Effective immediately	P		

0 ~ 6000

F15.55	Motor 1 turn corresponds to the number of LU (32 bits)	Setting range	Factory value	Unit	Effective method	Related Models		
		0 ~ 1073741824	10000	--	Effective immediately	P		

Group F16 PN commissioning parameters

F16.00	Receiving word PZD1	Setting range	Factory value	Unit	Effective method	Related Models		
		0000H ~ FFFFH	0	--	Display only	P	S	T

0 ~ 65535

F16.01	Receiving word PZD2	Setting range	Factory value	Unit	Effective method	Related Models		
		0000H ~ FFFFH	0	--	Display only	P	S	T

0 ~ 65535

F16.02	Receiving word PZD3	Setting range	Factory value	Unit	Effective method	Related Models		
		0000H ~ FFFFH	0	--	Display only	P	S	T

0 ~ 65535

F16.03	Receiving word PZD4	Setting range	Factory value	Unit	Effective method	Related Models		
		0000H ~ FFFFH	0	--	Display only	P	S	T

0 ~ 65535

F16.04	Receiving word PZD5	Setting range	Factory value	Unit	Effective method	Related Models		
		0000H ~ FFFFH	0	--	Display only	P	S	T

0 ~ 65535

F16.05	Receiving word PZD6	Setting range	Factory value	Unit	Effective method	Related Models		
		0000H ~ FFFFH	0	--	Display only	P	S	T

0 ~ 65535

F16.06	Receiving word PZD7	Setting range	Factory value	Unit	Effective method	Related Models		
		0000H ~ FFFFH	0	--	Display only	P	S	T

0 ~ 65535

F16.07	Receiving word PZD8	Setting range	Factory value	Unit	Effective method	Related Models		
		0000H ~ FFFFH	0	--	Display only	P	S	T

0 ~ 65535

F16.08	Receiving word PZD9	Setting range	Factory value	Unit	Effective method	Related Models		
		0000H ~ FFFFH	0	--	Display only	P	S	T

0 ~ 65535

F16.09	Receiving word PZD10	Setting range	Factory value	Unit	Effective method	Related Models		
		0000H ~ FFFFH	0	--	Display only	P	S	T

0 ~ 65535

F16.10	Receiving word PZD11	Setting range	Factory value	Unit	Effective method	Related Models		
		0000H ~ FFFFH	0	--	Display only	P	S	T

0 ~ 65535

F16.11	Receiving word PZD12	Setting range	Factory value	Unit	Effective method	Related Models		
		0000H ~ FFFFH	0	--	Display only	P	S	T

0 ~ 65535

F16.16	Send word PZD1	Setting range	Factory	Unit	Effective	Related

			value		method	Models		
		0000H ~ FFFFH	0	--	Display only	P	S	T

0 ~ 65535

F16.17	Send word PZD2	Setting range	Factory value	Unit	Effective method	Related Models		
		0000H ~ FFFFH	0	--	Display only	P	S	T

0 ~ 65535

F16.18	Send word PZD3	Setting range	Factory value	Unit	Effective method	Related Models		
		0000H ~ FFFFH	0	--	Display only	P	S	T

0 ~ 65535

F16.19	Send word PZD4	Setting range	Factory value	Unit	Effective method	Related Models		
		0000H ~ FFFFH	0	--	Display only	P	S	T

0 ~ 65535

F16.20	Send word PZD5	Setting range	Factory value	Unit	Effective method	Related Models		
		0000H ~ FFFFH	0	--	Display only	P	S	T

0 ~ 65535

F16.21	Send word PZD6	Setting range	Factory value	Unit	Effective method	Related Models		
		0000H ~ FFFFH	0	--	Display only	P	S	T

0 ~ 65535

F16.22	Send word PZD7	Setting range	Factory value	Unit	Effective method	Related Models		
		0000H ~ FFFFH	0	--	Display	P	S	T

					only			

0 ~ 65535

F16.23	Send word PZD8	Setting range	Factory value	Unit	Effective method	Related Models		
		0000H ~ FFFFH	0	--	Display only	P	S	T

0 ~ 65535

F16.24	Send word PZD9	Setting range	Factory value	Unit	Effective method	Related Models		
		0000H ~ FFFFH	0	--	Display only	P	S	T

0 ~ 65535

F16.25	Send word PZD10	Setting range	Factory value	Unit	Effective method	Related Models		
		0000H ~ FFFFH	0	--	Display only	P	S	T

0 ~ 65535

F16.26	Send word PZD11	Setting range	Factory value	Unit	Effective method	Related Models		
		0000H ~ FFFFH	0	--	Display only	P	S	T

0 ~ 65535

F16.27	Send word PZD12	Setting range	Factory value	Unit	Effective method	Related Models		
		0000H ~ FFFFH	0	--	Display only	P	S	T

11.5 Digital Input (DI) Function Definition Table

setpoint	symbolic	name (of a thing)	instructions
1	S_ON	Servo Enable	Invalid - Servo motor enable disable Valid - Servo motor power-up enable
2	ERR_RST	Alarm reset	According to the alarm type, the servo is able to continue to work after some alarms are reset. This function is along valid level, when set terminal is level valid, also only valid when along change is detected.
3	MODE_SEL	Mode switching selection	Switching between speed, position and torque according to the selected control mode (3, 4, 5)
4	PERR_CLR	Deviation clearance	Invalid - no action Effective - Clears the pulse deviation.
5	PSEC_EN	Internal multi-segment position enable signal	Invalid - ignore internal multi-segment instructions. Effective - start internal multi-segment
8	MI_SEL1	Switching 16-segment operation commands	Selection of 16 position or speed commands for execution via DI terminal
9	MI_SEL2	Switching 16 run commands	
10	MI_SEL3	Switching 16 run commands	
11	MI_SEL4	Switching 16 run commands	
13	ZERO_SPD	Zero speed clamp function	Valid - Enables the zero fix function. Invalid - Zero fix function is disabled.
14	INHIBIT	Pulse Prohibition	valid - command pulse input is disabled. Invalid - Allow command pulse input.
15	P_OT	forward overtravel	When the mechanical movement exceeds the moveable range limit switch operates and enters the overtravel protection function. Valid - forward overtravel, forward drive disabled Invalid - normal range, positive drive allowed
16	N_OT	negative overtravel	When the mechanical movement exceeds the moveable range limit switch operates and enters the overtravel protection function. Valid - negative overtravel, positive drive disabled Invalid - normal range, positive drive allowed
17	P_CL	Positive external torque limiting	Effective - External torque limiting is effective Invalid - external torque limiting is invalid
18	N_CL	Negative external torque limiting	Effective - External torque limiting is effective Invalid - external torque limiting is invalid
19	P_JOG	forward-pointing	Valid - input according to the given command Invalid - Run command stops input
20	N_JOG	Negative point movement	Valid - reverse input as per the given command Invalid - Run command stops input
21	GEAR_SE	Electronic Gear	GEAR_SEL1 invalid - electronic gear ratio 1

setpoint	symbolic	name (of a thing)	instructions
	L1	Selection	GEAR_SEL1 valid - electronic gear ratio 2
23	POS_DIR	Position command reverse	Invalid - no commutation. Effective - Commutation
24	SPD_DIR	Speed command reverse	Invalid - no commutation Effective - Commutation
25	TOQ_DIR	Torque command reverse	Invalid - no commutation; Valid - commutation
26	XINT_ULK	Unlock interrupt positioning	Invalid - no effect ; Valid - When parameter F04.52 is set to 2 or 4, the position instruction interrupt execution lock state is released
27	XINT_OFF	Prohibit execution of interrupt positioning	Invalid - no effect. Valid - When parameter F04.52 is not set to 0, this DI can be used to disable the interrupt positioning function at any time after interrupt execution is enabled.
28	HOME_IN	Home position signal	Can be used as home position signal or deceleration position signal
29	STHOME	Initiate origin return process	Begin execution of origin return
30	ESTOP	emergency stop	Invalid - no effect Valid - go to emergency stop
31	STEP	Position stepping enable	Valid - instructions for executing the amount of the instruction step. Invalid-command is zero, position state
32	FORCE_ERR	Forced failsafe input	Invalid - no effect Valid - go to fault state
34	XINT_TRIG	Interrupt positioning execution trigger signal	Invalid - no effect ; Valid - When the value of parameter F04.52 is not 0, the position instruction is triggered to interrupt the execution process
35	INPOS_HALT	Pause to generate internal position commands	null and void: no effect. Effective: deceleration and suspension of execution of internal multi-segment position and interrupt positioning
36	AI_OFF	Disable analog input	null and void: no effect. Valid: Analog input disabled
37	ENC_SEN	SEN enables absolute position data transmission	Invalid - no effect ; Valid - OAOBOZ sends absolute position data, servo cannot be enabled at this time
38	Z_DETEC	Encoder Z-pulse detection input	
39	EX_LATCH1	External latch input 1	
40	EX_LATC	External latch input 2	

setpoint	symbolic	name (of a thing)	instructions
	H2		
41	SIGN	Pulse input direction	
42	PLUS	Number of pulse inputs	

11.6 Digital Output (DO) Function Definition Table

setpoint	symbolic	name (of a thing)	instructions
1	RDY	Servo ready.	The servo state is ready to receive the S_ON valid signal. Effective - Servo ready Invalid - Servo not ready
2	ERR	Fault output signal	Status valid when fault is detected
3	WARN	Warning output signal	Warning output signal active (on)
4	COIN	Positioning complete	For position control, the position deviation pulse is valid when it reaches within the positioning completion range F06.50
5	TGON	Motor rotation output signal	When the speed of the servo motor is higher than the speed threshold Valid - Motor rotation signal is valid Invalid - Motor rotation signal is invalid
6	V_ZERO	zero-speed signal	The signal that is output when the servo motor stops rotating. Effective motor speed is zero Invalid motor speed is not zero
7	V_CMP	speed consistency	For speed control, the absolute value of the difference between the servo motor speed and the speed command is less than the F06.46 Speed Consistency Signal Width is valid.
8	NEAR	Positioning proximity signals	For position control, the position deviation pulse is valid when it reaches the set value of the positioning proximity signal amplitude F06.52
9	T_LT	Torque limiting signal	Confirmation signal for torque limiting Effective - Motor torque limited Invalid - motor torque is not limited
10	V_LT	Rotational speed limit signal	Acknowledgement signal for speed limitation during torque control Effective - motor speed limited Ineffective - motor speed not limited
11	T_ARR	Torque reaches specified range	The output signal is valid when the torque command value is detected to reach the value set in F06.57, the permissible variation range is determined by F06.58
12	V_ARR	Speed feedback reaches specified range	The output signal is valid when the speed feedback value is detected at the value set in F06.47, allowing a variation range of +/- F06.48
14	XINT_DONE	Interrupt positioning complete	Output when the position instruction interrupt execution is complete
17	HOME	Return of origin completed	

setpoint	symbolic	name (of a thing)	instructions
18	XINT_WORK	Interrupt to locate ongoing execution	Flag interrupt positioning is executing
19	PCOM1	Comparison of trigger signals in position 1	Trigger signal output when position 1 reaches the corresponding range
20	PCOM2	Comparison of trigger signals in position 2	Trigger signal output when position 2 reaches the corresponding range
21	PCOM3	Comparison of trigger signals at position 3	Trigger signal output when position 3 reaches the corresponding range
22	PCOM4	Comparison of trigger signals in position 4	Trigger signal output when position 4 reaches the corresponding range
23	HALTING	Halting valid	Servo is on halt status.

Chapter 12: Faults and Warnings

12.1 List of fault and warning codes

The fault codes are described in the following table.

Alarm Codes	name (of a thing)	stopping method	Can it be reset?	Alarm records
E.01	Model setting fault	immediate stop	non-resettable	No records kept
E.02	Product Matching Failure	immediate stop	non-resettable	No records kept
E.03	System parameter anomaly	immediate stop	non-resettable	No records kept
E.04	Fault in parameter storage	immediate stop	non-resettable	No records kept
E.05	FPGA Failure	immediate stop	non-resettable	No records kept
E.06	Program anomalies	immediate stop	non-resettable	No records kept
E.07	Encoder initialization failed	immediate stop	non-resettable	Storage records
E.08	Short circuit to ground detection fault	immediate stop	non-resettable	Storage records
E.09	Overcurrent fault 1	immediate stop	non-resettable	Storage records
E.10	Overcurrent fault 2	configurable	resettable	Storage records
E.11	Current sampling faults	immediate stop	non-resettable	Storage records
E.12	Hardware initialization failure	immediate stop	non-resettable	Storage records
E.13	Program Run Error	immediate stop	non-resettable	Storage records
E.14	Abnormal absolute encoder turns	immediate stop	resettable	Storage records
E.15	Pulse encoder disconnection fault, or absolute encoder communication abnormality	configurable	resettable	Storage records
E.16	Encoder data anomaly	configurable	resettable	Storage records

Alarm Codes	name (of a thing)	stopping method	Can it be reset?	Alarm records
E.17	Abnormally low encoder battery voltage	immediate stop	resettable	Storage records
E.18	Excessive speed deviation	configurable	resettable	Storage records
E.19	Torque saturation timeout	configurable	resettable	Storage records
E.20	Control of electrical undervoltage	configurable	resettable	Storage records
E.21	flying car trouble	configurable	resettable	Storage records
E.22	overvoltage	immediate stop	resettable	Storage records
E.23	undervoltage	deceleration stop	resettable	Not stored by default, optional
E.24	AI sampling voltage is too large	immediate stop	resettable	Storage records
E.25	overspeed	immediate stop	resettable	Storage records
E.26	Electrical angle recognition failure	immediate stop	resettable	No records kept
E.27	Inertia recognition failure fault	immediate stop	resettable	No records kept
E.28	DI terminal parameter setting fault	immediate stop	resettable	No records kept
E.29	DO terminal parameter setting fault	immediate stop	resettable	No records kept
E.30	Invalid servo ON command fault	configurable	resettable	No records kept
E.31	Excessive mixing deviation fault	immediate stop	resettable	Storage records
E.32	Crossover pulse output overspeed	configurable	resettable	Storage records
E.33	Excessive position deviation fault	configurable	resettable	Storage records
E.34	Main circuit input is out of phase	configurable	resettable	Storage records
E.35	Driver output out of phase	configurable	resettable	Storage records
E.37	Motor overload	configurable	resettable	Storage records
E.38	Electronic gear setting error	configurable	resettable	No records

Alarm Codes	name (of a thing)	stopping method	Can it be reset?	Alarm records
				kept
E.39	Radiator overheating	configurable	resettable	Storage records
E.40	Pulse input abnormality	configurable	resettable	Storage records
E.41	Excessive deviation from fully closed-loop position	configurable	resettable	Storage records
E.44	User-forced failure	deceleration stop	resettable	Storage records
E.45	Absolute position reset fault	configurable	resettable	Storage records
E.46	Mains power failure	deceleration stop	resettable	Not stored by default, optional
E.47	DB brake overload	deceleration stop	resettable	Storage records
E.50	First start after writing in a custom version of the program	immediate stop	non-resettable	No records kept
E.55	Offline JOG and inertia recognition are not allowed when the bus is started or the PLC is not OFF	configurable	resettable	Storage records
E.56	Device name and IP and MAC are not allowed to be written while the bus is running	configurable	resettable	Storage records
E.57	MCU and 200P parallel port error	deceleration stop	resettable	Storage records
E.58	External overspeed	immediate stop	resettable	Storage records
E.59	Excessive mixing deviation	configurable	resettable	Storage records
E.60	Profinet IRT configuration cycles and servo cycles are not divisible	configurable	resettable	Storage records
E.61	MAC address loss correction exists	configurable	resettable	Storage records
E.62	Synchronization failure	configurable	resettable	Storage records
E.63	CANOpen track buffer underflow	configurable	resettable	Storage records
E.64	CANOpen track buffer overflow	configurable	resettable	Storage records
E.65	DSC function is not allowed in non-IRT mode	configurable	resettable	Storage records

Alarm Codes	name (of a thing)	stopping method	Can it be reset?	Alarm records
E.66	EtherCAT synchronization failure	configurable	resettable	Storage records
E.67	Synchronization clock error	configurable	resettable	Storage records
E.68	command exception	configurable	resettable	Storage records
E.69	Pattern error	configurable	resettable	Storage records
E.70	Slave initialization failed	configurable	non-resettable	Storage records
E.71	Program version exception	immediate stop	non-resettable	No records kept
E.72	Torque exceeds set value	configurable	resettable	Storage records
A.80	Abnormal STO wiring during servo enable or in servo enable	non-stop	resettable	No records kept
A.81	Undervoltage warning	non-stop	resettable	No records kept
A.82	Motor overload warning	non-stop	resettable	Storage records
A.84	Parameter changes requiring reapplication of power	non-stop	resettable	No records kept
A.85	Servo not ready	non-stop	resettable	No records kept
A.86	Write E2PROM frequent operation warning	non-stop	resettable	No records kept
A.87	Positive overtravel warning alert	non-stop	resettable	No records kept
A.88	Negative overtravel warning alert	non-stop	resettable	No records kept
A.89	Position command over speed	non-stop	resettable	No records kept
A.90	Absolute encoder angle initialization warning	non-stop	resettable	Storage records
A.91	Energy consumption brake overload	non-stop	resettable	Storage records
A.92	External regenerative drain resistance too small	non-stop	resettable	No records kept
A.93	emergency stop	deceleration stop	resettable	No records kept
A.94	Origin return error	deceleration stop	resettable	No records kept

Alarm Codes	name (of a thing)	stopping method	Can it be reset?	Alarm records
A.95	Encoder battery undervoltage	non-stop	resettable	No records kept
A.96	AD sampling not completed	non-stop	resettable	No records kept
A.97	Limit alignment	non-stop	resettable	No records kept

The early warning codes are described in the following table.

Early Warning Code	name (of a thing)	Can it be reset?	Alarm records
A.80	Abnormal STO wiring during servo enable or in servo enable	resettable	No records kept
A.81	Undervoltage warning	resettable	No records kept
A.82	Motor overload warning	resettable	Storage records
A.84	Parameter changes requiring reapplication of power	resettable	No records kept
A.85	Servo not ready	resettable	No records kept
A.86	Write E2PROM frequent operation warning	resettable	No records kept
A.87	Positive overtravel warning alert	resettable	No records kept
A.88	Negative overtravel warning alert	resettable	No records kept
A.89	Position command over speed	resettable	No records kept
A.90	Absolute encoder angle initialization warning	resettable	Storage records
A.91	Energy consumption brake overload	resettable	Storage records
A.92	External brake drain resistor too small	resettable	No records kept
A.93	emergency stop	resettable	No records kept
A.94	Origin return error	resettable	No records kept
A.95	Encoder battery undervoltage	resettable	No records kept
A.96	AD sampling not completed	resettable	No records kept
A.97	Limit alignment	resettable	No records kept
A.98	Abnormal low-speed pulse DI configuration	resettable	No records kept

12.2 Cause of failure and measures to deal with it

Fault codes and names	reason	Treatment measures
E.01. **Model setting fault**	1. the encoder connection cable is damaged or loosely connected. 2. Invalid motor model or drive model	1. check whether the encoder wiring is normal and ensure that it is firmly wired. 2. Replace with a valid motor model or drive model
E.02. **Product Matching Failure**	1. the encoder connection cable is damaged or loosely connected. 2. Use of unsupported external interfaces such as encoders. 3. Mismatch between motor model and drive model power. 4. Non-existent product model codes	1. check whether the encoder wiring is good. 2. Replacement of mismatched products. 3、Select the correct encoder type or replace the drive with another type; for example, the power level of the set motor model is greater than the power level of the drive, or the power level of the set motor model is more than two levels different than the power level of the drive will report this fault
E.03. **System parameter anomaly**	1. Control of transient drops in supply voltage. 2、After upgrading the driver software, the range of some parameters has been changed, resulting in the previously stored parameters exceeding the upper and lower limits	1. ensure that the supply voltage is within specification and restore the factory parameters (F23.06 set to 1). 2、If you have upgraded the software, please restore the factory parameters first
E.04. **Fault in parameter storage**	1. Too frequent reading and writing of parameters. 2. Failure of parameter storage equipment. 3. Unstable control power supply. 4、Driver failure	1 The upper unit modifies parameters and writes to the EEPROM too frequently by communication. Check the communication program for instructions to modify parameters and write to the EEPROM too

Fault codes and names	**reason**	**Treatment measures**
		frequently. 2 Check the control electrical wiring while ensuring that the control supply voltage is within specification
E.05. **FPGA Failure**	Software version anomaly	Check if the software version matches
E.06. **Program anomalies**	1. Abnormal system parameters. 2、Driver internal failure	EEPROM failure, restore factory parameters (F23.06 set to 1), re-power
E.07. **Encoder initialization failed**	Abnormal encoder signal detected at power-up	Check encoder wiring, or replace encoder cable
E.08. **Short circuit to ground detection fault**	1. incorrect UVW wiring. 2. Damage to the motor. 3、Driver failure	1. detect whether the cable UVW is shorted to ground, if so replace the cable. 2, test the motor line resistance and resistance to ground is normal, such as abnormal replacement of the motor
E.09. **Overcurrent fault 1**	1. command input and turn-on servo synchronization or command input too fast. 2. the external braking resistor is too small or short-circuited. 3. Poor motor cable contact. 4. Grounding of motor cables. 5. short-circuiting of the motor UVW cable. 6. Burned out motors. 7. Software detects power transistor overcurrent	1 Check that the encoder and power wires are wired correctly between the motor drives. 2. measure whether the resistance value of the braking resistor meets the specification, and reselect a reasonable braking resistor according to the manual. 3. Check the cable connectors for looseness and ensure that they are tight. 4. check the insulation resistance between the motor UVW line and the motor ground wire Replace the motor if the insulation is poor. 5. check whether the motor cable connection UVW is short-circuited and connect the motor cable correctly.

Fault codes and names	reason	Treatment measures
		6, check whether the resistance value between the cables of the motor is the same, different then replace the motor. 7、Reduce the load. Upgrade drive, motor capacity, extend acceleration and deceleration time
E.10. **Overcurrent fault 2**	1. command input and turn-on servo synchronization or command input too fast. 2. the external braking resistor is too small or short-circuited. 3. Poor motor cable contact. 4. Grounding of motor cables. 5. short-circuiting of the motor UVW cable. 6. Burned out motors. 7. Software detects power transistor overcurrent	1 Check that the encoder and power wires are wired correctly between the motor drives. 2. measure whether the resistance value of the braking resistor meets the specification, and reselect a reasonable braking resistor according to the manual. 3. Check the cable connectors for looseness and ensure that they are tight. 4. check the insulation resistance between the motor UVW line and the motor ground wire Replace the motor if the insulation is poor. 5. check whether the motor cable connection UVW is short-circuited and connect the motor cable correctly. 6, check whether the resistance value between the cables of the motor is the same, different then replace the motor. 7、Reduce the load. Upgrade drive, motor capacity, extend acceleration and deceleration time
E.11. **Current sampling faults**	Drive internal current sampling fault	Contact the manufacturer or distributor to replace the servo drive
E.12. **Hardware initialization failure**	1、Servo Drive hardware initialization detection abnormal	1、Check the external environment, temperature, humidity, and electromagnetic environment is

Fault codes and names	**reason**	**Treatment measures**
		normal 2. Contact the manufacturer or distributor to replace the drive
E.13. **Program Run Error**	Drive internal abnormality, or firmware update abnormality	1. Contact the manufacturer or distributor to confirm that the drive version and firmware version match; 2. Replace the drive with a new one
E.14. **Abnormal absolute encoder turns**	Incremental encoders. 1. abnormal Z signal reception, poor Z signal line wiring or encoder failure resulting in loss of Z signal. Absolute encoders. 2. Insufficient battery power for absolute encoders. 3. parameter F08.24 = 1 (set to absolute system), no encoder initialization operation is performed. 4、During drive power failure, the encoder motor end wiring is unplugged	1. manually rotate the motor shaft, if the fault is still reported, check the encoder wiring, rewire or replace the cable, or replace the encoder and reapply power. 2. need to determine whether the battery is normal, if the battery voltage is insufficient, please replace the battery. 3. initialize F23.06 = 7 turns and reapply power. 4. Turn F23.06 =7 initialize turns and reapply power
E.15. **Pulse encoder disconnection fault, or absolute encoder communication abnormality**	1. Disconnection of communicating encoders. 2. The encoder is not earthed. 3、Communication verification exception	1. check the encoder wiring, or replace the encoder cable. 2、Check whether the encoder is well grounded
E.16. **Encoder data anomaly**	1. broken wire or poor contact of the serial encoder. 2、Serial encoder storage data read/write abnormality	Check wiring, or replace encoder cable
E.17. **Abnormally low encoder battery voltage**	Abnormal encoder battery voltage	Replace the encoder battery and reset the multi-turn value
E.18. **Excessive speed deviation**	The absolute difference between the speed command and the actual measured speed exceeds the	1. Increase the setting of F08.22. 2. extend the acceleration and deceleration times of internal

Fault codes and names	reason	Treatment measures
	threshold value set in F08.22	position commands or adjust the gain to improve the response of the system. 3. Set the speed deviation excessive threshold function to invalid, i.e. F08.22 = 0
E.19. **Torque saturation timeout**	The torque is saturated for a long time and the duration exceeds the threshold value set in F08.23	1. Increase the setting time of parameter F08.23. 2、Check if UVW is disconnected
E.20. **Control of electrical undervoltage**	Poor control electrical input wiring, or input power failure	1、Check the input power and wiring 2、Replacement of the drive
E.21. **flying car trouble**	The motor flies out of speed due to wiring and other errors that cause the control circuit to diverge	1、Check UVW and encoder wiring 2, check the drive, motor, if necessary, please replace, and contact the manufacturer to test
E.22. **overvoltage**	1. The supply voltage exceeds the permissible range, AC 280V. 2. disconnection of the braking resistor and mismatch of the braking resistor, resulting in the inability to absorb regenerative energy. 3. The load inertia exceeds the permissible range. 4、Driver damage	1. Enter the correct voltage range. 2. Check whether the external resistor has been connected. Measure whether the resistance of the external resistor has been disconnected to ensure that the wiring is correct, and if the resistor has been burned, recommend replacing it with a more powerful external resistor (contact the manufacturer for advice). 3, extend the acceleration and deceleration time, or according to the load inertia to re-select the appropriate drive and motor
E.23. **undervoltage**	1. A drop in the supply voltage. 2. The occurrence of a transient power failure. 3. the undervoltage protection point (F08.12) is set too high. 4、Driver damage	1. To increase the voltage capacity of the power supply and ensure its stability. 2、Check whether the undervoltage protection point (F08.12) setting is high if the power supply voltage is

Fault codes and names	**reason**	**Treatment measures**
	(Note: This fault does not store records by default and can be set to store or not via F08.32)	normal
E.24. **AI sampling voltage is too large**	1. incorrect AI wiring. 2. High external input voltage	Connect the AI input correctly and set the input voltage to within ±10V
E.25. **overspeed**	1. the speed command exceeds the maximum speed setting. 2. UVW phase sequence error. 3. Significant overshoot of the velocity response. 4、Driver failure	1. Speed reduction instructions. 2. Check that the UVW phase sequence is correct. 3. adjusting the speed loop gain to reduce overshoot. 4. Drive replacement
E.26. **Electrical angle recognition failure**	1. Too large a load or inertia. 2、The encoder wiring is wrong	1. reducing the load or increasing the current loop gain. 2、Replacement of encoder cable
E.27. **Inertia recognition failure fault**	1. the load or inertia is so large that the motor cannot operate according to the specified curve. 2. Other failures in the identification process lead to termination of identification	1. reducing the load or increasing the current loop gain. 2. Ensure that the identification process is normal
E.28. **DI terminal parameter setting fault**	1. different physical DI terminals are repeatedly assigned the same DI function. 2. Physical DI terminals and communication-controlled DI functions are assigned simultaneously	1. the case where the same function is configured to more than one physical DI terminal in F06.01 to F06.09. 2. The functions assigned in F06.01 to F06.09 are enabled at the same time as the corresponding binary bits in F09.05 to F09.08, please refer to the usage of F09.05 to F09.08; Reassign DI function
E.29. **DO terminal parameter setting fault**	Different DOs are repeatedly assigned the same output	If the same function is configured to multiple DOs in F06.21 to F06.29, reassign the DO function.
E.30. **Invalid servo ON command fault**	After executing the auxiliary function to energize the motor, the servo ON command is still entered from the upper computer	Changing improper handling practices

Fault codes and names	reason	Treatment measures
E.31. **Excessive mixing deviation fault**	Inconsistent internal and external feedback during gantry synchronization or full closed loop	1. Check if the mixing deviation over threshold is too small 2. Check whether the internal and external feedback directions and units are consistent 3、Check if the wiring is correct 4. Replace the driver, or external sensor
E.32. **Crossover pulse output overspeed**	Exceeds the upper limit of pulse output allowed by the hardware	Change the crossover output setting function code so that the entire speed at which the servo is operating Within the range, the crossover output pulse frequency will not exceed the limit
E.33. **Excessive position deviation fault**	1. UVW wiring of the servo motor. 2. low servo drive gain. 3. The high frequency of the position command pulse. 4. Excessive acceleration of position commands. 5. The position deviation exceeds the value set for the position deviation too large fault (F01.16) by too small a value. 6、Servo driver/motor failure	1. confirm the wiring of the main motor circuit cables and rewire them. 2. Confirm whether the servo drive gain is too low and increase the gain. 3. attempt to reduce the command frequency before running a reduced position command frequency, command acceleration or adjusting the electronic gear ratio. 4. lowering the command acceleration and then running to join the position command acceleration and deceleration time parameters and other smoothing functions. 5. Confirm that the position deviation fault value (F01.16) is appropriate and set the (F01.16) value correctly. 6、Background check the running graphics, if the input does not feedback, please replace the servo

Fault codes and names	**reason**	**Treatment measures**
		drive
E.34. **Main circuit input is out of phase**	1. poor contact of the three-phase input cable. 2, phase failure, that is, in the main power ON state, R / S / T phase of a phase voltage is too low state for more than 1 second	1. Check whether the cable of the three-phase power input is firmly connected (pay attention to safety and do not operate with electricity). 2、Measure the voltage of each phase of the three-phase power supply to ensure that the input power supply is three-phase balanced or that the input power supply voltage meets specifications
E.35. **Driver output out of phase**	1. poor wiring of the motor UVW. 2、The motor is damaged and there is a broken circuit	1. Check UVW wiring. 2、Replacement of servo motor
E.37. **Motor overload**	Operation with load exceeds the drive inverse time curve for the following reasons. 1. bad or loose connection of the motor UVW line or encoder line. 2, motor blocking or driven by external forces, such as mechanical jamming, collision, gravity or other external forces dragging, or mechanical brakes (holding brakes) run without opening. 3、When wiring multiple drives, mistakenly connect other same motor UVW line and encoder line to different drives. 4. Excessive load and small drive or motor selection. 5. Possible missing phase or wrong phase sequence connection. 6、Driver or motor damage	1. confirm that there are no problems with the motor UVW line and encoder wiring. 2. Confirm that the motor is not blocked or driven by external forces and that the mechanical brake (holding brake) has been opened. 3. confirm that there is no cross-wiring of multiple drives and motors, i.e. no one motor UVW line and encoder line is connected to a different drive. 4. extend acceleration and deceleration times and reselect the appropriate drive or motor. 5. check whether the UVW of the motor output is connected wrongly and whether it is shorted to ground. 6、Replacement of drive or motor
E.38. **Electronic gear setting error**	Electronic gear ratio exceeds specification range [encoder resolution / 10000000, encoder resolution / 2.5]	Set the correct gear ratio range
E.39.	1. Damage to the fan.	1. whether the fan runs during

Fault codes and names	**reason**	**Treatment measures**
Radiator overheating	2. High ambient temperatures. 3. Reset of the overload fault by switching off the power supply after an overload and continuing several times. 4. the installation direction of the servo drive and the unreasonable interval with other servo drives. 5. Servo drive failure. 6、Driver or motor damage	operation, replace the fan or drive. 2. measuring the ambient temperature to improve the cooling conditions of the servo drive and reduce the ambient temperature. 3, check the fault record, whether there is a reported overload fault, change the fault reset method, wait 30s after the overload and then reset. Drive, motor selection power is too small, improve the drive, motor capacity, increase acceleration and deceleration time, reduce the load. 4. confirm the setting status of the servo drive and install it according to the installation standards of the servo drive. 5、Restart after 5 minutes of power failure, if the fault is still reported after restart, please replace the servo driver.
E.40. Pulse input abnormality	1. the input frequency is greater than the maximum frequency setting for the pulse input. 2、The input pulse is disturbed	1. Change the maximum permissible frequency, parameter F08.14. 2, the background software to check whether the command is abnormal, check the line grounding, ensure that the line is reliably grounded, signal using twisted shielded wire, input line and power line separate wiring
E.41. Excessive deviation from fully closed-loop position	1. External encoder anomalies. 2. The relevant settings are too conservative	1. confirm that the external encoder cable is connected correctly and replace the external encoder. 2、The deviation of the full closed loop is too large, the protection function is set wrongly confirm the setting of relevant parameters reset

Fault codes and names	reason	Treatment measures
		the relevant parameters
E.44. **User-forced failure**	Forced into fault state via DI function 32 (FORCE_ERR)	Normal DI function input, with DI function 32 configured and input active. Disconnecting the input will clear the fault
E.45. **Absolute position reset fault**	Absolute position encoder absolute position reset fault	Contact the manufacturer for technical support
E.46. **Mains power failure**	Power outage or abnormal main power line.	Check the input mains power supply for momentary power failure and increase the power supply voltage capacity.
E.47. **DB brake overload**	DB brakes frequently	Check the cause of frequent DB braking or switch off the function related to DB deceleration stop F06.56
E.50. **First start after writing in a custom version of the program**	First start after downloading a custom program to a drive that already has a standard program	Restore factory values for loading custom parameters
E.55. **Offline JOG and inertia recognition are not allowed when the bus is started or the PLC is not OFF**	Offline JOG and inertia recognition are not allowed when the bus is started or the PLC is not OFF	Check the wiring and reconnect.
E.56. **Device name and IP and MAC are not allowed to be written while the bus is running**	Device name and IP and MAC are not allowed to be written while the bus is running	NMT node reset, do not stop or reset the CAN node when the servo is ON
E.57. **MCU and 200P parallel port error**	MCU and 200P parallel port error	Repower, if it still does not work, replace the drive
E.58. **External overspeed**	1. the speed command exceeds the maximum speed setting.	1. Speed reduction instructions. 2. Check that the UVW phase

Fault codes and names	reason	Treatment measures
	2. UVW phase sequence error. 3. Significant overshoot of the velocity response. 4、Driver failure	sequence is correct. 3. adjusting the speed loop gain to reduce overshoot. 4. Drive replacement
E.59. Excessive mixing deviation	1. External encoder disconnection. 2. Damage to the external encoder. 3、Equipment transmission failure	1. check or replace the external encoder and wiring. 2. Check or replace the external encoder and wiring. 3、Check the mechanical drive part and repair the mechanical part
E.60. Profinet IRT configuration cycles and servo cycles are not divisible	Profinet IRT configuration cycles and servo cycles are not divisible	Adjusting the IRT cycle
E.61. MAC address loss correction exists	MAC address loss correction exists	Check if node is online, NMT node reset
E.62. Synchronization failure	Synchronization with the host computer fails in CANOpen IP mode	NMT node reset, or 6040 sends a fault reset command
E.63. CANOpen track buffer underflow	Synchronous clock lost more than 2 times in CANOpen IP or CSP mode	Check the communication line for interference and confirm that the upper unit is operating properly. NMT node reset, or 6040 sends a fault reset command
E.64. CANOpen track buffer overflow	The synchronization clock is too fast in CANOpen IP or CSP mode, or the actual clock frequency does not match the configured value	Check the communication line for interference, confirm that the host computer is operating normally, and confirm that the clock frequency is consistent with the configured value. the NMT node resets, or the 6040 sends a fault reset command
E.65. DSC function is not allowed in non-IRT mode	DSC function is used in non-IRT mode	Configure IRT mode, then use DSC
E.66. EtherCAT	EtherCAT synchronization failure	NMT node reset, or 6040 sends a fault reset command

Fault codes and names	**reason**	**Treatment measures**
synchronization failure		
E.67. Synchronization clock error	Maximum number of consecutive communication losses over the set value	Please check if the network cable is plugged in tightly, or replace the shielded network cable, try to set a large F09.20
E.68. command exception	CSP mode operation speed command exceeds motor maximum speed	NMT node reset, or 6040 sends a fault reset command
E.69. Pattern error	Servo enable, 6060h for unsupported control modes style	NMT node reset, or 6040 sends a fault reset command
E.70. Slave initialization failed	EtherCAT slave initialization failed	Try re-flashing the XML configuration file, and then re-powering
E.71 Program version exception	Program version does not match hardware	Burn the corresponding version of the program or contact the manufacture
E.72 Torque exceeds set value	The torque exceeds the set value and reaches the set time	1. Check whether the values of F08.44 and F08.45 are within a reasonable range 2. Check whether there is a stall

12.3 Reasons for early warning and measures to address them

Warning codes and names	reason	Treatment measures
A.80. **Abnormal STO wiring during servo enable or in servo enable**	STO switch operation, or abnormal STO wiring	1. check that the STO switch is working. 2、Check the wiring
A.81. **Undervoltage warning**	Warning status of the output when the bus voltage is low	1. Check that the input mains power is normal. 2、Lower the undervoltage detection point parameter F08.12
A.82. **Motor overload warning**	Operation with load exceeds the drive inverse time curve for the following reasons. 1. bad or loose connection of the motor UVW line or encoder line. 2, motor blocking or driven by external forces, such as mechanical jamming, collision, gravity or other external forces dragging, or mechanical brakes (holding brakes) run without opening. 3、When wiring multiple drives, mistakenly connect other same motor UVW line and encoder line to different drives. 4. Excessive load and small drive or motor selection. 5. Possible missing phase or wrong phase sequence connection. 6、Driver or motor damage	1. confirm that there are no problems with the motor UVW line and encoder wiring. 2. Confirm that the motor is not blocked or driven by external forces and that the mechanical brake (holding brake) has been opened. 3. confirm that there is no cross-wiring of multiple drives and motors, i.e. no one motor UVW line and encoder line is connected to a different drive. 4. extend acceleration and deceleration times and reselect the appropriate drive or motor. 5. check whether the UVW of the motor output is connected wrongly and whether it is shorted to ground. 6、Replacement of drive or motor
A.84. **Parameter changes requiring reapplication of power**	Changed parameters that require reapplication of power to take effect	Repowering
A.85.	Servo ON when servo is not ready	Give enable again when servo

Servo not ready		READY is detected
A.86. **Write E2PROM frequent operation warning**	Program operates E2PROM abnormally often	Reduce the frequency of EEPROM write operations, you can switch to communication write commands that do not store EEPROM
A.87. **Positive overtravel warning alert**	1. Pot and Not are valid at the same time and do not normally appear together on the workbench. 2、Servo axes in a certain direction in the overtravel state, can automatically lift	The positive limit switch is triggered to check the operating mode, give a negative command or manually turn the motor, leave the positive limit and the warning will be cleared automatically
A.88. **Negative overtravel warning alert**	1. Pot and Not are valid at the same time and do not normally appear together on the workbench. 2、Servo axes in a certain direction in the overtravel state, can automatically lift	The negative limit switch is triggered to check the operating mode, give a positive command or manually turn the motor, leave the positive limit and it will automatically clear the warning
A.89. **Position command over speed**	1. the electronic gear ratio is set too large. 2、The pulse frequency is too high	1. Reduction of the set electronic gear ratio. 2、Reducing the input pulse frequency
A.90. **Absolute encoder angle initialization warning**	Excessive deviation (greater than 7.2 degrees electrical angle) warning when reinitializing encoder angle	Replace the motor
A.91. **Energy consumption brake overload**	Energy consumption brake power overload 1. incorrectly wired or poorly contacted braking resistors. 2. The use of built-in resistors is likely to result in the disconnection of default short wires. 3. Insufficient capacity of the braking resistor. 4. excessive resistance of the braking resistor leading to prolonged braking. 5. The input voltage exceeds that specified. 6. incorrect setting of braking resistor resistance, capacity, or	1. check whether the braking resistor wiring is normal. 2. check that the built-in resistor is wired properly. 3. Increasing the capacity of the braking resistor. 4. Reduction of braking resistor resistance. 5. Reduction of the voltage value of the input. 6. Setting the appropriate parameters according to specifications. 7、Replacement of servo driver

	heating time constants. 7、Servo drive failure	
A.92. External regenerative drain resistance too small	1. the external regenerative drain resistance is less than the minimum value required by the driver. 2、Incorrect parameter setting	1. Configure the power of the external regenerative drain resistor according to specifications. 2、Check whether the parameters F01.18~F01.21 are correct
A.93. emergency stop	Emergency stop triggered	Normal DI function input, with DI function 30 configured and input valid. Disconnect the input to disarm the warning
A.94. Origin return error	1. the time taken to search for the origin exceeds the set value of F11.07. 2. the F11.02 parameter is set to 3, 4 or 5 and the limit is encountered. 3、When not using the limit as the origin, the limit is touched twice	1. Increase the F11.07 setting. 2, back to the origin of the search speed is too fast, reduce the speed back to the origin of the search F11.04, F11.05
A.95. Encoder battery under voltage	Encoder battery voltage detection warning	Check and replace the encoder battery
A.96. AD sampling not completed		
A.97. Limit alignment	Limit encountered during operation in synchronous cycle position mode bit, resulting in position feedback and instructions not being aligned	Sending a reverse command to exit the limit zone will automatically clear the warning (an Full precaution, no manual rotation of the motor)
A.98	Corresponding pulse DI is not configured	Configure DI5 to 41, Configure DI6 to 42.