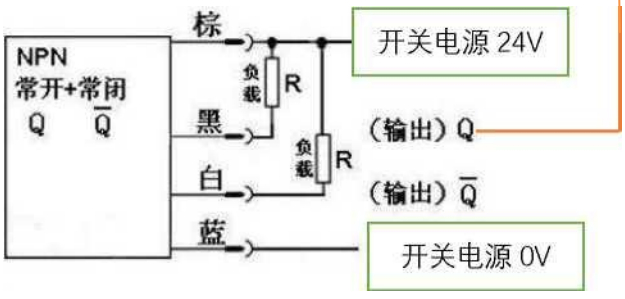
Usage of the driver KS100

1. in the internal position mode, the power-on will automatically return to zero

Parameter number	Set the value	Parameter description
FA-14	3	Internal position mode
FA-53	1	Internal enable
FD-32	2 or 3	2:return to the origin in the forward direction,ORGP as a reference point for returning to the origin 3:return to the origin in the reversal direction ,ORGP as a reference point for returning to the origin
FD-33	0	0: After finding the reference origin, return to the zero point of the absolute position of the single circle as the mechanical origin;
FD-34	1	Origin triggers the startup mode When the power is turned on, the origin regression function is automatically executed.
FD-36	500	Return to zero speed, return to the reference point speed
FD-37	60	Crawling speed, from the reference point to the origin position (the zero position of the encoder)
FC-1	34	DefinitionDI2As a reference point

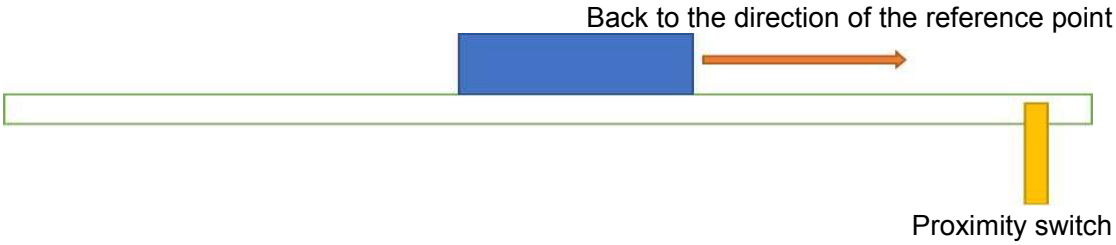
Way of wiring:

Foot number	Wiring instructions
16	power supply 24v
Four	



Description of returning to zero:

After the driver is turned on, it will automatically return to the reference point speed 500,run to the direction of the reference point. After touching the reference point, with the crawling speed 60,find the single-circle zero of the absolute value encoder and stop it.



2.external analog speed mode

External simulation quantity	
AS+	24 pin
AS-	9 25 pin

→ Simulation quantity±10V or 0 -10V

Use external simulation±10V,positive voltage turns forward and negative voltage reverses.
Use external simulation0-10V,then you can switch forward and reverse through the following input signals.

The directive is reversed		
COM	16 pin	+24V
DI2	4 pin	0 V the directive is reversed.

Need to be definedDI2Signal definition:FC-1Set it to 9.

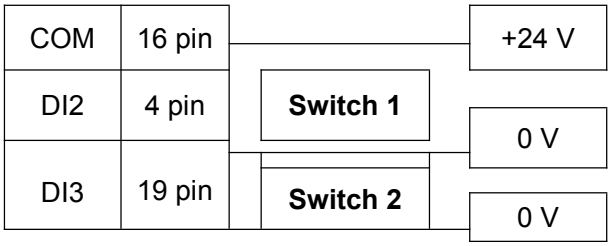
Commonly used parameters	Parameter description	Parameter setting
FA4	Control method	1
FA22	Internal and external speed selection	0
FA40	Accelerate time	User settings, ms
FA41	Slow down time	User settings, ms
FA43	Analog gain	300
FA44	The direction of operation is reversed	0
FA53	Servo enable	1
FC-1	DI2Definition of input port	9

Zero drift removal:
Due to the zero drift phenomenon in analog control, zero drift can be suppressed by the following methods.
Way1:
Select the analog zero first."A-A0",Push down[Set]Key to enter. Then select the speed simulation to 0.[A-SPd] Select it and press more than 3 seconds,when it displayed "donE", after that, activate the operation. Can press the button to return to the menu and select

the status after finishing.
Way2:
FC-2 set it to 7 ,FA55 set to 00000100, FA75 set it to 5 (when the instruction value is lower than5, the rotation speed is forced to be 0).
Way3:
Change the 7th FC15 parameter from right to left on the top. At the same time, FA75 is set to 10 (zero drift below 10 revolutions per minute is forced to 0)

3.internal speed mode

ex: Press the switch 1 Positive rotation speed 500 ,Release the stop; press the switch 2 Reverse speed 500,Release and stop



parameters	description	setting
FA4	Control method	1
FA22	Internal and external speed selection	1
FA40	Accelerate time	User settings
FA41	Slow down time	User settings
FA53	Servo enable	1
FA24	Internal speed^{One}	0
FA25	Internal speed^{Two}	500
FA26	Internal speed^{Three}	-500
FA27	Internal speed^{Four}	0
FC-1	DI2Function code	10
FC-2	DI3Function code	11

4.485Communication speed mode

Parameter	description	setting	address
FA4.	Control method	1	
FA22	Internal and external speed selection	1	
FA53	Servo enable	1	
FA24	Internal speed^{One}	0	
FA25	Internal speed^{Two}	Communication modification	0X0019
FA26	Internal speed^{Three}	0	
FA27	Internal speed^{Four}	0	
FC-30	Virtual terminal control	2	
FC-31	Input terminal control character	Communication modification	0X011F
FC-38	HypotheticalDI1Input	10	
FC-39	HypotheticalDI2Input	11	
FA71	Communication station number	According to the main station	
FA72	Communication baud rate	According to the main station	
FA73	Communication protocol	According to the main station	

Through modification0X0019To modify the rotation speed, you can also modify the rotation speed directly.Zero,The motor stops.

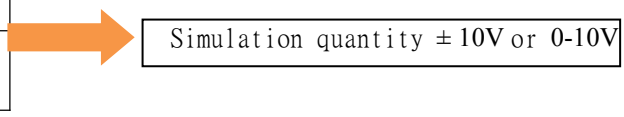
Through modification0X011FCome to modify the start and stop

0X011F: 0000 Stop

0X011F: 0001 Be in motion

5.External analog torque mode

External	
AS+	24 pin
AS-	9 25 pin



Use external simulation±10 V, Positive voltage positive torque, negative voltage negative torquep.

Use external simulation0-10V, can switch forward and reverse through the following input signals.

Directive reversed			
COM	16 pin	+24V	
DI2	4 pin	0V	The directive is reversed

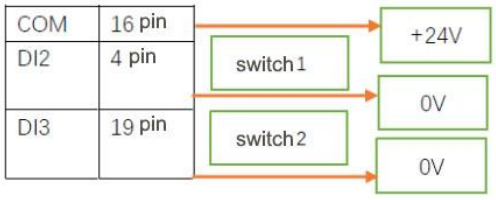
Need to be defined DI2 Signal definition:FC-1Set it to 9

parameters	description	setting
FA4	Control method	2
FA32	Internal and external torque instruction selection	0
FA29	Analog torque gain	100
FA33	Analog torque inversion	0
FA50	Speed limit during torque control	User settings
FA53	Servo enable	1
FC-1	DI2Definition of input port	9

Zero drift removal:
Due to the zero drift phenomenon in analog control, zero drift can be suppressed by the following methods:
Select the analog zero first."A-A0",Push down[Set]Key to enter. Then adjust to zero through torque simulation[A-Trq],Select it and then long press more than 3 seconds, to be displayed"donE" After that, activate the operation. After finishing, you can press the button to return to the menu to select Choose the status.

6. internal torque mode

ex: Press the switch1,The torque is 20%,release it 0 torque, press the switch 2,The torque is-20%, release it 0 torque



Note: The positive torque determines the forward rotation of the motor, and the negative torque determines the reverse rotation of the motor. The maximum speed limit value can only be positive.

parameters	description	setting	
FA4	Control method	2	
FA32	Internal and external selection	1	
FA50	Maximum speed limit during torque control	User settings	
FA53	Servo enable	1	
FA64	Internal torqueOne	0	
FA65	Internal torqueTwo	0.2	0.2=20%torque
FA66	Internal torqueThree	-0.2	-0.2=-20%torque
FA67	Internal torqueFour	0	
FC-1	DI2Function code	13	
FC-2	DI3Function code	14	

7.485Communication torque mode

parameters	description	settings	address
FA4	Control method	2	
FA32	Internal and external torque selection	1	
FA50	Maximum speed limit during torque control	Communicate to modify	0X0032
FA53	Servo enable	1	
FA64	Internal torqueOne	0	
FA65	Internal torqueTwo	Communicate to modify	0X0041
FA66	Internal torqueThree	0	
FA67	Internal torqueFour	0	

FC-30	Virtual terminal control	2	
FC-31	Terminal control control word	Communicate to modify	0X011F
FC-38	HypotheticalDI1Input	13	
FC-39	HypotheticalDI2Input	14	
FA71	MODBUS The address of the machine	According to the upper machine	
FA72	MODBUS Communication baud rate	According to the upper machine	
FA73	MODBUS Communication protocol	According to the upper machine	

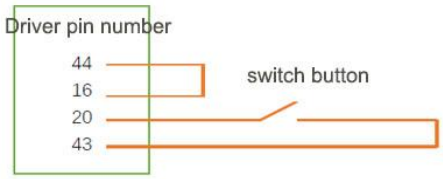
0X0032:The speed value in the register is to change the motor speed.

0X0041 : The size of the internal torque value to change the size of the output torque of the motor shaft

0X011F: 0001 Start the internal torque, 0000Internal torque stop

8. internal position control of switching quantity (relative position single-segment mode)

the wiring is as shown in the figure:



parameters	description	settings
FA4	Control method	0
FA11	1 circle pulses	10000
FA14	Position instruction pulse mode	3
FA53	Servo enable	1
FC-0	DI1Function code	28
FD-0	Internal location command mode	1
FD-2	The number of laps of the internal position in the first paragraph	1
FD-3	The number of pulses in the internal position circle in the first paragraph	5000
FD-4	The internal position speed of the first paragraph	500

The switch button is non self-locking, which means that if a momentary 0V signal is given to the 20 pins, the servo motor will operate according to the set position and speed function.

Note:

FD-2 and FD-3 can be set with positive and negative values. FD-4 can only be a positive value.

For example, FD-2 is set to 2 and FD-3 is set to -5000. The actual position of the motor is 2 * 10000-5000=15000

FD-2 is set to 2 and FD-3 is set to 5000. The actual position of the motor is 2 * 10000+5000=25000

FD-2 is set to -2, FD-3 is set to 5000, and the actual position of the motor is -2 * 10000+5000=-15000

FD-2 is set to -2, FD-3 is set to -5000, and the actual position of the motor is -2 * 10000-5000=-25000

9.485Communication mode control (relative position single segment mode)

parameters	description	settings	address
FA4	Control method	0	
FA11	1 circle pulses	10000	
FA14	Position instruction pulse mode	3	
FC-30	Virtual input terminal control	2	
FC-31	Virtual terminal control value	Communication modification	0X011F
FC-38	HypotheticalDI1	28	
FA53	Servo enable	1	
FD-0	Internal location command mode	1	
FD-2	The number of laps of the internal position in the first paragraph	Communication modification	0X0202
FD-3	The number of pulses in the internal position circle in the first paragraph	Communication modification	0X0203
FD-4	The internal position speed of the first paragraph	Communication modification	0X0204
FA71	MODBUS The address of the machine	According to the upper machine	
FA72	MODBUS Communication baud rate	According to the upper machine	
FA73	MODBUS Communication protocol	According to the upper machine	

0X011F: 0000 → 0001 Internal position triggered

Edge triggered mode, the servo motor operates according to the set position and speed.

Note: FD-2 and FD-3 can be set with positive and negative values. FD-4 can only be a positive value.

For example, FD-2 is set to 2 and FD-3 is set to -5000. The actual position of the motor is 2 * 10000-5000=15000

FD-2 is set to 2 and FD-3 is set to 5000. The actual position of the motor is 2 * 10000+5000=25000

FD-2 is set to -2, FD-3 is set to 5000, and the actual position of the motor is -2 * 10000+5000=-15000

FD-2 is set to -2, FD-3 is set to -5000, and the actual position of the motor is -2 * 10000-5000=-25000

Extension of other functions:

① If FC-39 is set to 27 and the internal position of DI2 stops, then 0X011F is set to 0010 and the motor immediately stops running

that 's ok.

② FC-20 is set to 16 to define DO1 output internal position positioning, which can be achieved by reading 0X1010 and reading the status

Bit 0 changes.

10.485Communication internal position tangent movement speed mode (position mode is absolute positioning)

The matching motor is a multi-lap absolute encoder.

parameters	description	settings	address
FA4	Control method	3	
FA11	1 circle pulses	10000	
FA14	Position instruction pulse mode	3	
FA22	The source of speed	5	
FA21	Click speed	Communication modification	0X0015
FC-30	Virtual input terminal control	2	
FC-31	Virtual terminal control value	Communication modification	0X011F
FC-38	Hypothetical DI2 (Internal location start)	28	
FC-39	Hypothetical DI2 (Mode switching)	16	
FC-40	Hypothetical DI3 (Forward inch movement)	22	
FC-41	Hypothetical DI4 (Reverse inch movement)	23	
FA53	Servo enable	1	
FD-0	Internal location command mode	0	
FD-2	The number of laps of the internal position in the first paragraph	Communication modification	0X0202
FD-3	The number of pulses in the internal position circle in the first paragraph	Communication modification	0X0203
FD-4	The internal position speed of the first paragraph	Communication modification	0X0204
FA71	MODBUS The address of the machine	According to the upper machine	
FA72	MODBUS Communication baud rate	According to the upper machine	
FA73	MODBUS Communication protocol	According to the upper machine	

Virtual terminal control word DI4 DI3 DI2 DI1

0X011F: In internal position mode of 0000

0X011F: 0000 → 0001 Internal position triggered

0X011F: 0010 jog speed mode

0X011F: 0110 positive jog speed mode

0X011F: 1010 Reverse Jogging Speed Mode

0X011F: 1110 or 0010 jog stop

Note that the motor should be in a stopped state when switching modes.

Absolute value coordinate reset method:

1.**Manual cleaning method:**

Parameter	value	Perform the operation	Explain
FC-36	1	A-FN to F-res	Clear the single-circle and multi-circle data of the encoder, and the encoder data is completely zeroed.
FC-34	When FC-36 is set to 1, FC-34 will display 0 upon entering. Pressing 1 will automatically jump to 0 Except for single loop and multi loop data of the encoder, the encoder data is completely reset to zero		

2. 485 communication encoder coordinates reset:

Modify the register address 0X0122 of FC-34 and write register data to 1

3. Check if the data encoder coordinates are reset to zero:

DF - Go into F-APO and check if the data inside becomes 0

11.485Communication internal position cut internal torque mode (position mode is relative positioning)

parameters	description	settings	address
FA4	Control method	4	
FA11	1 circle pulses	10000	
FA14	Position instruction pulse mode	3	
FA32	Source of torque instruction	1	
FA64	Internal torqueOne	Communication modification	0X0040
FC-30	Virtual input terminal control	2	
FC-31	Virtual terminal control value	Communication modification	0X011F
FC-38	Hypothetical DI2 (Internal location start)	28	
FC-39	Hypothetical DI2 (Mode switching)	16	
FC-40	Hypothetical DI3 (TRQ1)	13	
FC-41	Hypothetical DI4 (TRQ2)	14	
FA53	Servo enable	1	
FA50	Speed limit during torque control	Communication modification	0X0032
FD-0	Internal location command mode	1	
FD-2	The number of laps of the internal position in the first paragraph	Communication modification	0X0202
FD-3	The number of pulses in the internal position circle in the first paragraph	Communication modification	0X0203
FD-4	The internal position speed of the first paragraph	Communication modification	0X0204
FA71	MODBUS The address of the machine	According to the upper machine	
FA72	MODBUS Communication baud rate	According to the upper machine	
FA73	MODBUS Communication protocol	According to the upper machine	

Virtual terminal control word DI4 DI3 DI2 DI1

0X011F: In internal position mode of 0000

0X011F: 0000 → 0001 Internal position triggered
Edge triggered mode, the servo motor operates according to the set position and speed.
Note: FD-2 and FD-3 can be set with positive and negative values. FD-4 can only be a positive value.
For example, FD-2 is set to 2 and FD-3 is set to -5000. The actual position of the motor is 2 * 10000-5000=15000
FD-2 is set to 2 and FD-3 is set to 5000. The actual position of the motor is 2 * 10000+5000=25000
FD-2 is set to -2, FD-3 is set to 5000, and the actual position of the motor is -2 * 10000+5000=-15000
FD-2 is set to -2, FD-3 is set to -5000, and the actual position of the motor is -2 * 10000-5000=-25000
0X011F: 0010 internal torque mode
The torque value is modified by 0X0040
Positive torque for forward operation, negative torque for reverse operation
Speed value modified through 0X0032
Note that the motor should be in a stopped state when switching modes.

12. absolute value coordinate clearing method (single-circle multi-circle data zeroing)

Here is an example of a multi turn absolute value 17 bit encoder.

FA62 is set to 5 as a multi turn absolute encoder. After setting it up, the motor will receive a 53 alarm when connected to the driver for the first time

The alarm is a battery failure alarm.

Select 'F-clr' to clear the alarm operation on the encoder. The alarm number 53 caused by battery failure can be cleared through this operation

eliminate. After selecting the operation, press and hold the SET key for more than 3 seconds until "done" is displayed to activate the operation. After completion, you can press the key again

Return to the menu selection state.

Select 'F-res', perform a reset operation on the encoder, reset the encoder's multi turn information to zero, and set the FC-36 parameter value accordingly
Setting it to 1 can reset the information of multiple cycles simultaneously, achieving the goal of setting the origin;

Driver key encoder coordinates reset:

Parameter	value	Perform the operation	Explain
FC-36	0	A-FN to F-res	Clear the multi-circle data of the encoder
FC-36	1	A-FN to F-res	Clear the single-circle and multi-circle data of the encoder, and the encoder data is completely zeroed.
FC-34	When FC-36 is set to 1, FC-34 will display 0 upon entering. Pressing 1 will automatically jump to 0 Except for single loop and multi loop data of the encoder, the encoder data is completely reset to zero		

485 Clear the coordinates of the communication encoder:

Alter FC-34 the register address of 0X0122,Write register data1.

Check whether the data encoder coordinates are cleared to 0:

1,Df-EnterF-APO.check whether the data inside has become 0

2,Pass485 read the communication to see if the data is 0:

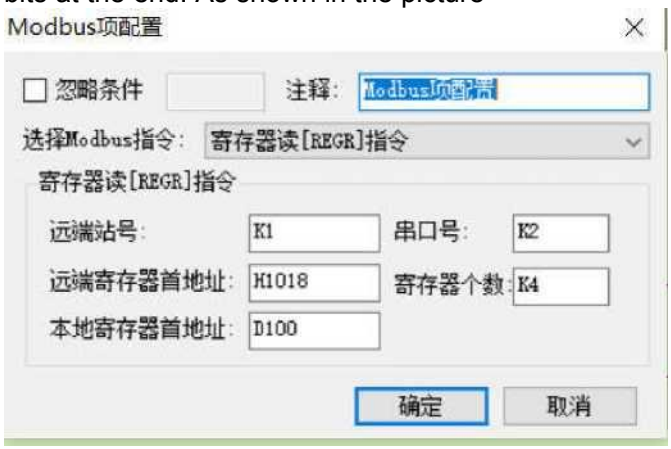
The address of the register	Explain	
1018 hours	Display the absolute position value15bit~0bit	
1019H	Display the absolute position value31 bits~16 bits	
101AH	Display the absolute position value47 bits~32-bit	
101 BH	Display the absolute position value63 bits~48 bits	

13. the communication method of absolute value coordinates:

①When FC-37 is set to 0: 64 bit overall data for single and multiple cycles (calculated data):

The address of the register	Explain	
1018 H	Display the absolute position value 15 bits~0 bit	
1019 H	Display the absolute position value 31 bits~16 bits	
101AH	Display the absolute position value 47bit~32-bit	
101 BH	Display the absolute position value 63 bits~48 bits	

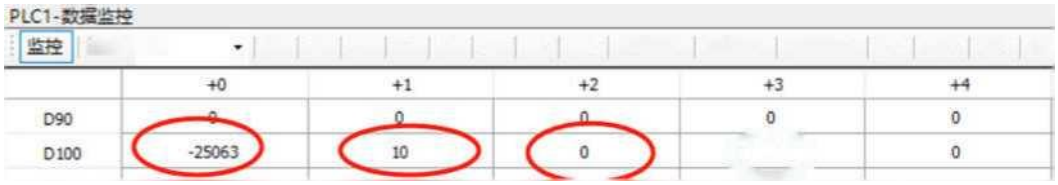
Read 4 consecutive readings from 1018H, with the low bits at the beginning and the high bits at the end. As shown in the picture



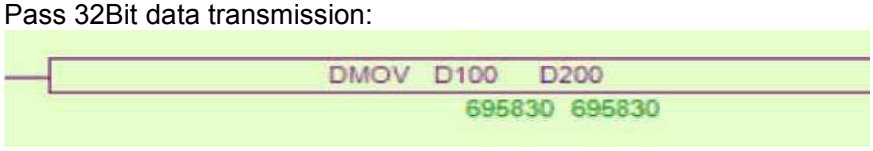
For example, when reading data from Xinjie and Mitsubishi PLCs, the low bits are in the front and the high bits are in the back, so there is no need for data exchange between high and low bits.

It have read four registers, D100, D101, D102, and D103. The 64 bit data is relatively large and difficult to process.

For the position coordinates of reciprocating positioning, 32-bit register data is sufficient.



Pass 32Bit data transmission:



So D200 (D201) is to obtain absolute value position data.

② When FC-37 is set to position 1, it can be divided into single turn position and

multi turn position.
1018H 1019H is the absolute value of a single cycle
101AH and 101BH are absolute multi cycle values
Using the same communication command as shown in the figure above, after reading and converting the data, D200 (D201) is the single loop value
D202 (D203) is a multi cycle value. But the actual position of the motor needs to go through a series of calculations of single and multiple turns.
Motor forward rotation: 217 x multi turn data+single turn data.
Motor reverse rotation: (Read multiple turns of data+1) × 217- (131072- Read single turn of data)
This article takes the use of Xinjie PLC as an example. If using Ximen PLC, after converting the register address to decimal, the register
The address should be+40001, and the two characters should be swapped with high and low bits, with the high bit before and the low bit after.