ZLAC8015D SERVO DRIVER

CANOPEN COMMUNICATION QUICK START GUIDE

Version	Description	Date
V1.00	First edition	2023/9/11

CATALOG

一、 OUTLINE

   This manual only gives a brief introduction to the most commonly used related concepts and precautions in the use of ZLAC8015, so that users can understand the normal use of ZLAC8015 series products in the shortest time.

Communication Standard followed by ZLAC8015
● CAN 2.0A Standard
● CANopen Standard protocol DS 301 V4.02
● CANopen Standard protocol DS 402 V2.01

Services supported by ZLAC8015
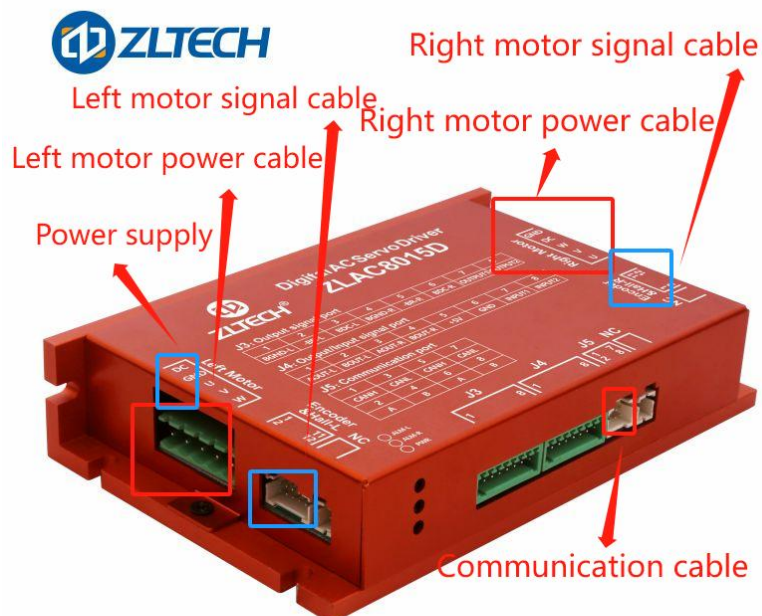● Support SDO service
● Support PDO service: each slave station can be configured with up to 4 TxPDOs and 4 RxPDOs
● Support NMT Slave service
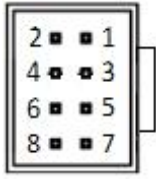● Device monitor: support heartbeat message

二、 WIRING CONNECTION

2.1 Basic Wiring Diagram

   Note: The power supply can be selected from either the left or right interfaces for power supply, or it can also be powered simultaneously

2.2 CANOPEN Port

Note: PIN1, PIN3 are a set of CANOPEN port, PIN5, PIN7 are another a set of CANOPEN port. These 2 sets of ports could be used at the same time, and user could use any set of port to communicate.

Port	Pin	Mark	Name	Function
	1	CANH	CANOPEN	
	3	CANL		
	2	A	RS485	
	4	B		
	5	CANH	CANOPEN	
	7	CANL		
	6	A	RS485	
	8	B		

三、 PROTOCOL FORMAT

3.1 Communication Setting

Baud rate: 500K, ID: 1 (default)

3.2 CANOPEN Basic Format

Note: ZLAC8015D will send a 700+ID NMT message when it is powered on. Receiving this message indicates successful communication. If this message is not received, please check the wiring connection and baud rate to ensure consistency, or power on again.

No.	Transfer Direction	Time	Status	Name	Frame ID	Format	Type	DLC	Data
)	Receive	15:05:36.526			0x00000701	Data Frame	Standard Frame	0x01	00

3.3 SDO Basic Format

COB-ID	Byte0	Byte1:2	Byte3	Byte4:7
Frame ID	SDO Command Word	Object Index	Object Sub-Index	Data

COB-ID	Byte0	Byte1	Byte2	Byte3	Byte4	Byte5	Byte6	Byte7
Master → Slave (Driver)								
0x601	23	FF	60	03	32	00	32	00
Slave (Driver) → Master								
0x581	60	FF	60	03	00	00	00	00

3.3.1 COB-ID Format

Send frame ID: 0x600 + Node address
Return frame ID：0x580 + Node address

3.3.2 Command word

Command	Function	Type	Data Length
2F	Set	M->S Request	1 Byte
2B	Set	M->S Request	2 Byte
23	Set	M->S Request	4 Byte
60	Set Feedback	S->M Confirm	
40	Read	M->S Request	0 Byte
80	Read Fault	S->M Answer	4 Byte

3.3.3 Index and Data Form

23   FF 60   00   64 00 64 00

      INDEX   DATA

Eg: The target speed index FF 60, so the actual value is: 60 FF. The left and right target speed data in the same format as the index.

※Byte Order: Little Endian (Low bit in front, high bit in back).

3.4 Heartbeat Message

Setting instruction:
Frame ID: 601
Data: 2B 17 10 00 E8 03 00 00 (time is 1000ms)

Heartbeat message format is shown as follows:

Heartbeat Producer → Consumer	
COB-ID	Byte 0
0x700+Node-ID	Status

The status description is shown as follows:

Status	Description
0x00	Boot-up
0x04	Stop Status
0x05	Operation Status
0x7F	Pre-operation Status

※Note: ZLAC8015D is producer of heartbeat message.

四、 CONTROL MODE

4.1 PROFILE VELOCITY MODE

Master Station (COB-ID:0x601)	Slave Station (COB-ID:0x581)	Function Description
2F 60 60 00 03 00 00 00	60 60 60 00 00 00 00 00	Set velocity mode
2B 40 60 00 06 00 00 00	60 40 60 00 00 00 00 00	Enable
2B 40 60 00 07 00 00 00	60 40 60 00 00 00 00 00	
2B 40 60 00 0F 00 00 00	60 40 60 00 00 00 00 00	
23 FF 60 03 64 00 64 00	60 FF 60 03 00 00 00 00	Set up synchronization Target speed 100rpm
23 FF 60 03 9C FF 9C FF	60 FF 60 03 00 00 00 00	Set up synchronization Target speed -100rpm
23 FF 60 03 64 00 32 00	60 FF 60 03 00 00 00 00	Set up synchronization Left speed 100rpm, Right speed 50rpm
23 FF 60 03 32 00 9C FF	60 FF 60 03 00 00 00 00	Set up synchronization Left speed 50rpm, Right speed -100rpm

4.2 PROFILE RELATIVE POSITION MODE

Master Station (COB-ID:0x601)	Slave Station (COB-ID:0x581)	Function Description
2F 60 60 00 01 00 00 00	60 60 60 00 00 00 00 00	Set position mode
23 81 60 01 3C 00 00 00	60 81 60 01 00 00 00 00	Set left motor max speed 60RPM
23 81 60 02 3C 00 00 00	60 81 60 01 00 00 00 00	Set right motor max speed 60RPM
2B 40 60 00 06 00 00 00	60 40 60 00 00 00 00 00	Enable
2B 40 60 00 07 00 00 00	60 40 60 00 00 00 00 00	
2B 40 60 00 0F 00 00 00	60 40 60 00 00 00 00 00	
23 7A 60 01 00 7D 00 00	60 7A 60 01 00 00 00 00	Set left motor target positon 32000
23 7A 60 02 00 83 FF FF	60 7A 60 02 00 00 00 00	Set right motor target positon -32000
2B 40 60 00 4F 00 00 00	60 40 60 00 00 00 00 00	Start relative motion
2B 40 60 00 5F 00 00 00	60 40 60 00 00 00 00 00	

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4.3 PROFILE ABSOLUTE POSITION MODE

Master Station (COB-ID:0x601)	Slave Station (COB-ID:0x581)	Function Description
2F 60 60 00 01 00 00 00	60 60 60 00 00 00 00 00	Set position mode
23 81 60 01 3C 00 00 00	60 81 60 01 00 00 00 00	Set left motor max speed 60r/min
23 81 60 02 3C 00 00 00	60 81 60 01 00 00 00 00	Set right motor max speed 60r/min
2B 40 60 00 06 00 00 00	60 40 60 00 00 00 00 00	Enable
2B 40 60 00 07 00 00 00	60 40 60 00 00 00 00 00	
2B 40 60 00 0F 00 00 00	60 40 60 00 00 00 00 00	
23 7A 60 01 00 7D 00 00	60 7A 60 01 00 00 00 00	Set left motor target positon 32000
23 7A 60 02 00 83 FF FF	60 7A 60 02 00 00 00 00	Set right motor target positon -32000
2B 40 60 00 0F 00 00 00	60 40 60 00 00 00 00 00	Start absolute motion
2B 40 60 00 1F 00 00 00	60 40 60 00 00 00 00 00	
23 7A 60 01 00 83 FF FF	60 7A 60 01 00 00 00 00	Set left motor target positon -32000
23 7A 60 02 00 7D 00 00	60 7A 60 02 00 00 00 00	Set right motor target positon 32000
2B 40 60 00 0F 00 00 00	60 40 60 00 00 00 00 00	Start absolute motion
2B 40 60 00 1F 00 00 00	60 40 60 00 00 00 00 00	

※ Attention: When controlling the position, the switching of the control word will simultaneously control two motors. Therefore, when controlling a single motor, the target position of the other motor should be given 0.

4.4 PROFILE TORQUE MODE

Master Station (COB-ID:0x601)	Slave Station (COB-ID:0x581)	Function Description
2F 60 60 00 04 00 00 00	60 60 60 00 00 00 00 00	Set torque mode
2B 40 60 00 06 00 00 00	60 40 60 00 00 00 00 00	Enable
2B 40 60 00 07 00 00 00	60 40 60 00 00 00 00 00	
2B 40 60 00 0F 00 00 00	60 40 60 00 00 00 00 00	
23 71 60 03 E8 03 E8 03	60 71 60 03 00 00 00 00	Set up synchronization Target torque 1000mA/s
23 71 60 03 18 FC 18 FC	60 71 60 03 00 00 00 00	Set up synchronization Target torque -1000mA/s
23 71 60 03 18 FC E8 03	60 71 60 03 00 00 00 00	Set up synchronization Left torque -1000mA/s Right torque 1000mA/s

4.5 GENERAL COMMAND

Master Station (COB-ID:0x604)	Function Description
2B 40 60 00 00 00 00 00	Stop
2B 40 60 00 80 00 00 00	Clear Fault
40 64 60 01 00 00 00 00	Read left motor encoder
40 64 60 02 00 00 00 00	Read right motor encoder
40 6C 60 03 00 00 00 00	Read left and right motor speed (Unit: 0.1RPM)
40 71 60 03 00 00 00 00	Read left and right motor current (Unit: 0.1A)
40 3F 60 00 00 00 00 00	Read fault code High 16 bits: (left) Low 16 bits: (right)
40 31 20 00 00 00 00 00	Read software version
40 32 20 01 00 00 00 00	Read left motor temperature (Unit: 1℃)
40 32 20 02 00 00 00 00	Read right motor temperature (Unit: 1℃)

4.6 EMERGENCY STOP COMMAND

Master Station (COB-ID:0x601)	Slave Station (COB-ID:0x581)	Function Description
2B 40 60 00 02 00 00 00	60 40 60 00 00 00 00 00	Mtor stops and keep enabled status
2B 40 60 00 0F 00 00 00	60 40 60 00 00 00 00 00	Motor Enable (Release Emergency Stop)

※ Attention: After sending emergency stop command, user needs to send enable command to release the emergency stop status.

五、FUNCTION SETTING

5.1 Alarm PWM Processing Method

Open Command:　Frame ID: 601　　Data: 2B 26 20 01 01 00 00 00

Close Command:　Frame ID: 601　　Data: 2B 26 20 01 00 00 00 00

Save Instruction:　Frame ID: 601　　Data: 2B 10 20 00 01 00 00 00

Trigger Mechanism: When enabling this function, driver will enter an alarm and short-circuit the motor's power UVW (after the motor power cable UVW short-circuit, it will generate resistance during motor's rotation)

Function: To prevent the robot from sliding instantly after motor alarms

5.2 Parking Mode

Open Command: Frame ID: 601   Data: 2B 26 20 04 01 00 00 00

Close Command: Frame ID: 601   Data: 2B 26 20 04 00 00 00 00

Trigger Mechanism: When enabling this function, the motor output current will not exceed 3A

Function: When the robot is charging or standby, enter this function to prevent the motor from over temperature problem

5.3 Speed Resolution

Setting Instruction: Frame ID: 601   Data: 2B 26 20 05 0A 00 00 00 (setting range: 0-10) 10 is hexadecimal A

Save Instruction: Frame ID: 601   Data: 2B 10 20 00 01 00 00 00

Rule: Set to A, output speed unit: 1/10=0.1 RPM. Eg: target speed is 100 RPM, and the actual output is 10 RPM

Set to 5, output speed units: 1/5=0.2 RPM. Eg: target speed is 100 RPM, and the actual output is 20 RPM

Set to 1, output speed unit: 1/1=1 RPM. Eg: target speed is 100 RPM, and the actual output is 100 RPM

Trigger Mechanism: After enabling the testing function, it must be saved and restarted to be effective

Function: User could use more precise target speed control

5.4 I/O Emergency Stop Processing Method

5.4.1 Wiring Diagram J3
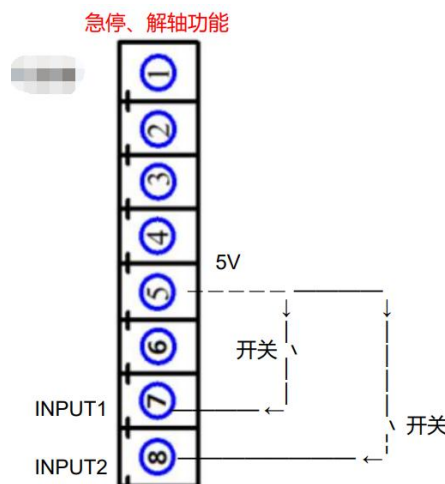
5.4.2 IO wiring instructions

The internal grounding of the ZLAC8015D driver is already common, so after the setting is completed, any wire can be connected to achieve the emergency stop function

5.4.3 CANOPEN Command Setting

Enable input interface INPUT1 emergency stop function: Frame ID: 601 Data: 2B 30 20 02 09 00 00 00

Enable input interface INPUT2 emergency stop function: Frame ID: 601 Data: 2B 30 20 03 09 00 00 00

Save instruction: Frame ID: 601 Data: 2B 10 20 00 01 00 00 00

Command to enable IO emergency stop shaft release function:

Frame ID: 601 Data: 2B 26 20 03 01 00 00 00

Command to turn off the IO emergency stop axis release function:

Frame ID: 601 Data: 2B 26 20 03 00 00 00 00

Save instruction: Frame ID: 601 Data: 2B 10 20 00 01 00 00 00

Trigger mechanism: After activating this function, and triggering an external emergency stop, the motor will be in an enabled state (0 speed)

Function: When the robot is in an abnormal state, it can be pushed forward.

5.5 Brake Function

5.5.1 Wiring Diagram

Note: 20V-24V DC, brake doesn't have positive or negative poles, and could be wired freely.
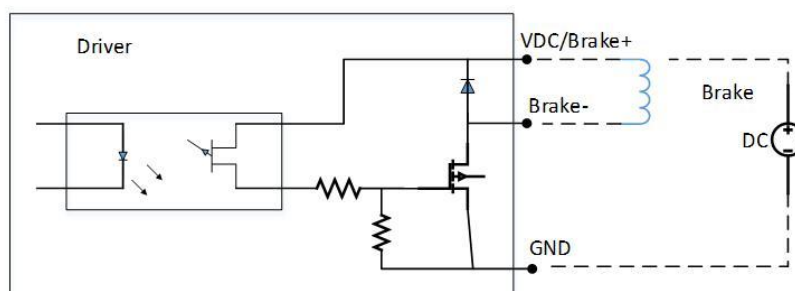
5.5.2 Brake Command Setting

Release brake command: Frame ID: 601 Data: 2B 30 20 07 00 00 00 00

Frame ID: 601 Data: 2B 30 20 08 00 00 00 00

Close brake command: Frame ID: 601 Data: 2B 30 20 07 01 00 00 00

Frame ID: 601 Data: 2B 30 20 08 01 00 00 00

Function: If user's motor is equipped with an external electromagnetic brake, this command can be used to release and close the brake.

六、 PDO MAPPING STEPS

6.1 TPDO MAPPING

Configure 0x606C 03 as TPDO0, for transmission methods, use event trigger (254) or timer trigger (255) respectively

Mater Station(COB-ID:0x601)	Slave Station(COB-ID:0x581)	Function Description
2F 00 1A 00 00 00 00 00	60 00 1A 00 00 00 00 00	Clear TPDO0 mapping
23 00 1A 01 20 03 6C 60	60 00 1A 01 00 00 00 00	Map 0x606C 03 to 0x1A00 01
2F 00 18 02 FE 00 00 00	60 00 18 02 00 00 00 00	Set TPDO0 transmission method to

		event trigger
2B 00 18 03 E8 03 00 00	60 00 18 03 00 00 00 00	Set inhibit time 500ms (unit: 0.5ms)
2F 00 1A 00 01 00 00 00	60 00 1A 00 00 00 00 00	Enable 1 TPDO0 mapping
2B 10 20 00 01 00 00 00	60 10 20 00 00 00 00 00	Save parameters to EEPROM

Mater Station(COB-ID:0x601)	Slave Station (COB-ID:0x581)	Function Description
2F 00 1A 00 00 00 00 00	60 00 1A 00 00 00 00 00	Clear TPDO0 mapping
23 00 1A 01 20 03 6C 60	60 00 1A 01 00 00 00 00	Map 0x606C 03 to 0x1A00 01
2F 00 18 02 FF 00 00 00	60 00 18 02 00 00 00 00	Set TPDO0 transmission method to timer trigger
2B 00 18 05 E8 03 00 00	60 00 18 05 00 00 00 00	Set inhibit time 500ms (unit: 0.5ms)
2F 00 1A 00 01 00 00 00	60 00 1A 00 00 00 00 00	Enable 1 TPDO0 mapping
2B 10 20 00 01 00 00 00	60 10 20 00 00 00 00 00	Save parameters to EEPROM

After the mapping is completed, send the NMT start command.

The format of the NMT enable command is as follows (take ID 1 as an example):
COB-ID: 000   Data: 01+ID (00 represents enabling PDO of all addresses)
Enabling address 1:   Frame ID: 000   Data: 01 01
Enabling all addresses: Frame ID: 000   Data: 01 00

The TPDO upload format is shown in the table below:

Slave Station(COB-ID:0x181)	Function Description
01 02 03 04	The data uploaded to 606C 03 is 01 02 03 04. (Low in front and high in back)

The format of the NMT close command is as follows:
COB-ID: 000   Data: 80+ID   (00 represents closing PDO of all addresses)
Closing address 1:   Frame ID: 000   Data: 80 01
Closing all addresses: Frame ID: 000   Data: 80 00

※ Note: After closing, TPDO will stop uploading.

6.2 RPDO MAPPING

Configure 0x60FF and 60FF 02 as TPDO1, transmission method is event trigger (254).

Mater Station(COB-ID:0x601)	Slave Station(COB-ID:0x581)	Function Description
2F 01 16 00 00 00 00 00	60 01 16 00 00 00 00 00	Clear RPDO1 mapping
23 01 16 01 20 01 FF 60	60 01 16 01 00 00 00 00	Map 0x60FF to 0x1601 01
23 01 16 02 20 02 FF 60	60 01 16 02 00 00 00 00	Map 0x60FF to 0x1601 02
2F 01 16 00 02 00 00 00	60 01 16 00 00 00 00 00	Enable RPDO1 mapping
2B 10 20 00 01 00 00 00	60 10 20 00 00 00 00 00	Save parameters to EEPROM

After the mapping is completed, send the NMT start command.

The format of the NMT enable command is as follows (take ID 1 as an example):

COB-ID: 000   Data: 01+ID (00 represents enabling PDO of all addresses)

Enabling address 1:   Frame ID: 000   Data: 01 01

Enabling all addresses: Frame ID: 000   Data: 01 00

The RPDO upload format is shown in the table below:

Slave Station (COB-ID:0x301)	Function Description
01 02 03 04	Write 01 02 03 04 to 60FF 01
	Write 01 02 03 04 to 60FF 02

The format of the NMT close command is as follows:

COB-ID: 000   Data: 80+ID   (00 represents closing PDO of all addresses)

Closing address 1:   Frame ID: 000   Data: 80 01

Closing all addresses: Frame ID: 000   Data: 80 00

※Note: After closing, sending RPDO will be invalid.

6.3 MAPPING DESCRIPTION

The meaning of "20" in the mapping instruction:

Note: 20 represents the number of digits of the mapped index data type (converting hexadecimal "20" to decimal means "32")

606Ch	00	Number of sub-indexes	Number of sub-indexes	U16	RO	NO	3
	01	Velocity_actual_value (left)	Current motor speed, Unit: 0.1 r / min	I32	RO	YES	0
	02	Velocity_actual_value (right)	Current motor speed, Unit: 0.1 r / min	I32	RO	YES	0
	03	Left motor and right motor speed actual value combination High 16 is left motor, Low 16 is right motor.	Current motor speed, Unit: 0.1 r / min	U32(I16+I16)	RO	YES	0

七、 CANOPEN STATUS WORD

7.1 PROFILE VELOCITY MODE STATUS WORD

Status	Byte Definition	Function Description
6041h	Bit0~Bit3	6040=0： xxxx xxxx xxxx 0000 6040=6： xxxx xxxx xxxx 0001 6040=7： xxxx xxxx xxxx 0011 6040=F： xxxx xxxx xxxx 0111
	Bit5	0: Driver is in emergency stop status; 1: Driver is not in emergency stop state; (Command Emergency Stop)
	Bit10	0: Speed is not in place; 1: Speed is in place;
	Bit12	0: Speed is not 0RPM; 1: The speed is 0RPM;
	Bit14	0: The motor is stopping; 1: The motor is running;
	Bit15	0: Not in external emergency stop state; 1: In external emergency stop state;

7.2 PROFILE POSITION MODE STATUS WORD

Status	Byte Definition	Function Description
6041h	Bit0~Bit3	6040=0： xxxx xxxx xxxx 0000 6040=6： xxxx xxxx xxxx 0001 6040=7： xxxx xxxx xxxx 0011 6040=F： xxxx xxxx xxxx 0111
	Bit5	0: Driver is in emergency stop status; 1: Driver is not in emergency stop state; (Command Emergency Stop)
	Bit10	0: Target position is not reached; 1: Target location is reached;
	Bit12	0: The target location is not valid; 1: The target location is valid;
	Bit13	0: The motor is not running in place; 1: The motor is running in place; (It's judged based on the threshold of driver deviation)
	Bit14	0: The motor is stopping; 1: The motor is running;
	Bit15	0: Not in external emergency stop state; 1: In external emergency stop state;

7.3 PROFILE TORQUE MODE STATUS WORD

Status	Byte Definition	Function Description
6041h	Bit0~Bit3	6040=0：xxxx xxxx xxxx 0000 6040=6：xxxx xxxx xxxx 0001 6040=7：xxxx xxxx xxxx 0011 6040=F：xxxx xxxx xxxx 0111
	Bit5	0: Driver is in emergency stop status; 1: Driver is not in emergency stop state; (Command Emergency Stop)
	Bit10	0: The target torque is not reached; 1: Target torque is reached;
	Bit14	0: The motor is stopping; 1: The motor is running;
	Bit15	0: Not in external emergency stop state; 1: In external emergency stop state;

Note: Low 16 represents the left motor, high 16 represents the right motor

八、 FAULT CODE

Index	Fault code	Description	Troubleshooting
603Fh	0x0000 0000h	No error	Driver is normal.
	0x0000 0001h	Over-voltage	1. Power supply voltage is too high 2. Excessive back electromotive force (it is recommended to add a bleeder circuit)
	0x0000 0002h	Under-voltage	1. Power supply voltage is too low 2. Check if the wiring connector is correct 3. Check if the motor parameters are correct
	0x0000 0100h	EEPROM read and write error	1. Firmware is upgraded (needs to make factory settings) 2. EEPROM circuit is damaged
	0x0000 0004h	Left motor over-current	1. Instantaneous current is too high 2. Motor power cable is loose
	0x0000 0008h	Left motor overload	1. Check if the motor cable is loose 2. Check if the wiring and motor parameters are correct 3. Motor is stall 4. Motor or driver's problem
	0x0000 0020h	Left motor encoder value is out of tolerance	1. Motor is stall 2. Encoder's problem
	0x0000 0080h	Left motor reference voltage error	Reference voltage circuit issue
	0x0000 0020h	Left motor hall error	1. Check if the motor cable is loose 2. Motor's problem 3. Driver's problem

0x0000 0400h	Left motor temperature is too high.	1. The motor current is too high (it is recommended to monitor motor's actual current and temperature, and reduce the current in real-time control) 2. Motor's thermistor is damaged 3. Driver's circuit is damaged	
0x0000 0800h	Left motor Encoder error	1. Check if the motor encoder cable is loose 2. Check if the motor encoder cable is disconnected	
0x0004 0000h	Right motor over-current	1. Instantaneous current is too high 2. Motor power cable is loose	
0x0008 0000h	Right motor overload	1. Check if the motor cable is loose 2. Check if the wiring and motor parameters are correct 3. Motor is stall 4. Motor or driver's problem	
0x0020 0000h	Right motor encoder value is out of tolerance	1. Motor is stall 2. Encoder's problem	
0x0080 0000h	Right motor reference voltage error	Reference voltage circuit issue	
0x0200 0000h	Right motor hall error	1. Check if the motor cable is loose 2. Motor's problem 3. Driver's problem	
0x0400 0000h	Right motor temperature is too high.	1. The motor current is too high (it is recommended to monitor motor's actual current and temperature, and reduce the current in real-time control) 2. Motor's thermistor is damaged 3. Driver's circuit is damaged	
0x0800 0000h	Right motor Encoder error	1. Check if the motor encoder cable is loose 2. Check if the motor encoder cable is disconnected	

九、OBJECT DICTIONARY

Index	Sub-Index	Name	Description	Type	Attribute	PDO Mapping	Default
CiA301 Basic Communication Parameter Group							
1000h	00	Equipment type	This device supports CiA301, CiA402 protocol	U32	RO	NO	0X00040192
1001h	00	Error register	Driver current error status	U8	RO	NO	0
1005h	00	Synchronous message COB identifier	Synchronous message COB identifier	U32	RW	NO	0x80
1009h	00	Hardware version	Hardware version	U16	RO	NO	-
100Ah	00	Hardware version	Hardware version	U16	RO	NO	-
1014h	00	COB-ID emmergency	COB-ID emmergency	U32	RW	NO	0x80
1017h	00	Producer heartbeat interval	Producer heartbeat interval, unit: ms	U16	RW	NO	0

1018h	00	Manufacturer Information	Sub-index	U8	RO	NO	2
	01	Vendor ID	Vendor ID	U32	RO	NO	0x0100
	02	Product Code	Product Code	U32	RO	NO	0x0001
1200h	00	Number of sub-indexes	Number of sub-indexes	U8	RO	NO	2
	01	COB-ID (Slave station receives)	COB-ID (Slave station receives)	U32	RO	NO	600h+Node-ID
	02	COB-ID (Slave station sends)	COB-ID (Slave station sends)	U32	RO	NO	580h+Node-ID
1400h	00	Number of sub-indexes	Number of sub-indexes	U8	RO	NO	5
	01	RPDO0-COB-ID	Identifier COB-ID	U32	RW/S	NO	200+Node-ID
	02	Transmission type	Transmission type	U8	RW/S	NO	FFh
	03	Prohibition time	Prohibition time	U16	RW/S	NO	0
	04	Maintain	Maintain	U8	RW	NO	0
	05	Event timer	Event timer	U16	RW/S	NO	0
1401h	00	Number of sub-indexes	Number of sub-indexes	U8	RO	NO	5
	01	RPDO1-COB-ID	Identifier COB-ID	U32	RW/S	NO	300+Node-ID
	02	Transmission type	Transmission type	U8	RW/S	NO	FFh
	03	Prohibition time	Prohibition time	U16	RW/S	NO	0
	04	Maintain	Maintain	U8	RW	NO	0
	05	Event timer	Event timer	U16	RW/S	NO	0
1402h	00	Number of sub-indexes	Number of sub-indexes	U8	RO	NO	5
	01	RPDO2-COB-ID	Identifier COB-ID	U32	RW/S	NO	400+Node-ID
	02	Transmission type	Transmission type	U8	RW/S	NO	FFh
	03	Prohibition time	Prohibition time	U16	RW/S	NO	0
	04	Maintain	Maintain	U8	RW	NO	0
	05	Event timer	Event timer	U16	RW/S	NO	0
1403h	00	Number of sub-indexes	Number of sub-indexes	U8	RO	NO	5
	01	RPDO3-COB-ID	Identifier COB-ID	U32	RW/S	NO	500+Node-ID
	02	Transmission type	Transmission type	U8	RW/S	NO	FFh
	03	Prohibition time	Prohibition time	U16	RW/S	NO	0
	04	Maintain	Maintain	U8	RW	NO	0
	05	Event timer	Event timer	U16	RW/S	NO	0
1600h	00	Number of sub-indexes	Number of sub-indexes	U8	RW/S	NO	1
	01	RPDO0-mapping 1	Map to 6040h register	U32	RW/S	NO	60400010h
	02	RPDO0-mapping 2	Not mapped	U32	RW/S	NO	-
	03	RPDO0-mapping 3	Not mapped	U32	RW/S	NO	-
	04	RPDO0-mapping 4	Not mapped	U32	RW/S	NO	-
1601h	00	Number of sub-indexes	Number of sub-indexes	U8	RW/S	NO	0
	01	RPDO1-mapping 1	Not mapped	U32	RW/S	NO	-
	02	RPDO1-mapping 2	Not mapped	U32	RW/S	NO	-
	03	RPDO1-mapping 3	Not mapped	U32	RW/S	NO	-

	04	RPDO1-mapping 4	Not mapped	U32	RW/S	NO	-
1602h	00	Number of sub-indexes	Number of sub-indexes	U8	RW/S	NO	0
	01	RPDO2-mapping 1	Not mapped	U32	RW/S	NO	-
	02	RPDO2-mapping 2	Not mapped	U32	RW/S	NO	-
	03	RPDO2-mapping 3	Not mapped	U32	RW/S	NO	-
	04	RPDO2-mapping 4	Not mapped	U32	RW/S	NO	-
1603h	00	Number of sub-indexes	Number of sub-indexes	U8	RW/S	NO	0
	01	RPDO3-mapping 1	Not mapped	U32	RW/S	NO	-
	02	RPDO3-mapping 2	Not mapped	U32	RW/S	NO	-
	03	RPDO3-mapping 3	Not mapped	U32	RW/S	NO	-
	04	RPDO3-mapping 4	Not mapped	U32	RW/S	NO	-
1800h	00	Number of sub-indexes	Number of sub-indexes	U8	RO	NO	5
	01	TPDO0-COB-ID	Identifier COB-ID	U32	RW/S	NO	180+Node-ID
	02	Transmission type	Transmission type	U8	RW/S	NO	FFh
	03	Prohibition time	Prohibition time	U16	RW/S	NO	0
	04	Maintain	Maintain	U8	RW	NO	0
	05	Event timer	Event timer	U16	RW/S	NO	0
1801h	00	Number of sub-indexes	Number of sub-indexes	U8	RO	NO	5
	01	TPDO1-COB-ID	Identifier COB-ID	U32	RW/S	NO	280+Node-ID
	02	Transmission type	Transmission type	U8	RW/S	NO	FFh
	03	Prohibition time	Prohibition time	U16	RW/S	NO	0
	04	Maintain	Maintain	U8	RW	NO	0
	05	Event timer	Event timer	U16	RW/S	NO	0
1802h	00	Number of sub-indexes	Number of sub-indexes	U8	RO	NO	5
	01	TPDO2-COB-ID	Identifier COB-ID	U32	RW/S	NO	380+Node-ID
	02	Transmission type	Transmission type	U8	RW/S	NO	FFh
	03	Prohibition time	Prohibition time	U16	RW/S	NO	0
	04	Maintain	Maintain	U8	RW	NO	0
	05	Event timer	Event timer	U16	RW/S	NO	0
1803h	00	Number of sub-indexes	Number of sub-indexes	U8	RO	NO	5
	01	TPDO3-COB-ID	Identifier COB-ID	U32	RW/S	NO	480+Node-ID
	02	Transmission type	Transmission type	U8	RW/S	NO	FFh
	03	Prohibition time	Prohibition time	U16	RW/S	NO	0
	04	Maintain	Maintain	U8	RW	NO	0
	05	Event timer	Event timer	U16	RW/S	NO	0
1A00h	00	Number of sub-indexes	Number of sub-indexes	U8	RW/S	NO	0
	01	RPDO1-mapping 1	Not mapped	U32	RW/S	NO	-
	02	RPDO1-mapping 2	Not mapped	U32	RW/S	NO	-
	03	RPDO1-mapping 3	Not mapped	U32	RW/S	NO	-
	04	RPDO1-mapping 4	Not mapped	U32	RW/S	NO	-
1A01h	00	Number of sub-indexes	Number of sub-indexes	U8	RW/S	NO	0
	01	RPDO1-mapping 1	Not mapped	U32	RW/S	NO	-

	02	RPDO1-mapping 2	Not mapped	U32	RW/S	NO	-
	03	RPDO1-mapping 3	Not mapped	U32	RW/S	NO	-
	04	RPDO1-mapping 4	Not mapped	U32	RW/S	NO	-
1A02h	00	Number of sub-indexes	Number of sub-indexes	U8	RW/S	NO	0
	01	RPDO2-mapping 1	Not mapped	U32	RW/S	NO	-
	02	RPDO2-mapping 2	Not mapped	U32	RW/S	NO	-
	03	RPDO2-mapping 3	Not mapped	U32	RW/S	NO	-
	04	RPDO2-mapping 4	Not mapped	U32	RW/S	NO	-
1A03h	00	Number of sub-indexes	Number of sub-indexes	U8	RW/S	NO	0
	01	RPDO3-mapping 1	Not mapped	U32	RW/S	NO	-
	02	RPDO3-mapping 2	Not mapped	U32	RW/S	NO	-
	03	RPDO3-mapping 3	Not mapped	U32	RW/S	NO	-
	04	RPDO3-mapping 4	Not mapped	U32	RW/S	NO	-
Factory Custom Parameter Group							
2000h	00	Communication offline time	Driver and host communication offline time setting. Unit: ms Range: 0-32767;	U16	RW	YES	0
2001h	00	RS485 Custom Drive Node Number	Range: 0-127	U16	RW	YES	1
2002h	00	RS485 custom communication baud rate	1：128000bps 2：115200bps 3：57600bps 4：38400bps 5：19200bps 6：9600bps	U16	RW	YES	2
2003h	00	Input signal status	2 input signal level status; Bit0-Bit1: X0-X1 input level status;	U16	RO	YES	0
2004h	00	Output signal status	2 output signal level status; Bit0-Bit1: Y0-Y1 output status; Bit2-Bit3: B0-B1 output status;	U16	RO	YES	0
2005h	00	Clear feedback position	Used to clear feedback position in profile position mode 0: invalid; 1: clear the left motor feedback position; 2. clear the right motor feedback position;	U16	RW	YES	0

			3．Clear the synchronization feedback position;				
2006h	00	In absolute position mode, clear the current position	Used to clear the current position in absolute position mode 0: invalid; 1: clear the left motor current position; 2: clear the right motor current position; 3: Set the synchronization origin;	U16	RW	YES	0
2007h	00	Electric lock shaft mode	0: Not enable, not lock the shaft; 1: Not enable, lock the shaft;	U16	RW	YES	0
2008h	00	Maximum motor speed	Maximum operating speed of the motor Unit: r/min; Range: 1-1000 r/min;	U16	RW	YES	1000
2009h	00	Register parameter setting	0: invalid; 1: restore factory settings;	U16	RW	YES	0
200Ah	00	CAN custom driver node number	Range: 1-127	U16	RW	YES	1
200Bh	00	CAN custom communication baud rate	0：1000 Kbit/s 1：500 Kbit/s 2：250 Kbit/s 3：125 Kbit/s 4：100 Kbit/s	U16	RW	YES	1
200Ch	00	Number of sub indexes	Number of sub indexes	U16	RO	NO	2
	01	Motor pole pairs (left)	4-64	U16	RW	YES	15
	02	Motor pole pairs (right)	4-64	U16	RW	YES	15
200Dh	00	Number of sub indexes	Number of sub indexes	U16	RO	NO	2
	01	Starting speed (left)	The initial speed at which the motion begins; Unit r/min; Range 1-256/min;	U16	RW	YES	1r/min
	02	Starting speed (right)	The initial speed at which the motion begins; Unit r/min; Range 1-256/min;	U16	RW	YES	1r/min
200Eh	00	Number of sub indexes	Number of sub indexes	U16	RW/S	YES	1
	01	Encoder wire Number Setting (left)	0-4096	U16	RW	YES	1024

	02	Encoder wire Number Setting (right)	0-4096	U16	RW	YES	1024
200Fh	00	Synchronous/asynchronous control flag bit	0: Asynchronous control 1: Synchronous control	U16	RW	YES	0
2010h	00	Whether save parameters in EEPROM	Is the communication write function code value updated to EEPROM 0: Invalid; 1: Save all RW attribute parameters to EEPROM;	U16	RW	YES	0
2011h	00	Number of sub indexes	Number of sub indexes	U16	RO	NO	2
	01	Offset angle between motor and Hall (left)	Unit 1 °; Range -360-+360	I16	RW	YES	0
	02	Offset angle between motor and Hall (right)	Unit 1 °; Range -360-+360	I16	RW	YES	0
2012h	00	Number of sub indexes	Number of sub indexes	U16	RO	NO	2
	01	Overload coefficient (left)	Range 0-300, unit%	U16	RW	YES	200
	02	Overload coefficient (right)	Range 0-300, unit%	U16	RW	YES	200
2013h	00	Number of sub indexes	Number of sub indexes	U16	RO	NO	2
	01	Motor temperature protection threshold (left)	Unit: 0.1°C; Range: 0-1200	U16	RW	YES	800
	02	Motor temperature protection threshold (right)	Unit: 0.1°C; Range: 0-1200	U16	RW	YES	800
	03	Driver temperature protection threshold	Unit: 0.1°C; Range: 0-1200	U16	RW	YES	800
2014h	00	Number of sub indexes	Number of sub indexes	U16	RO	NO	2
	01	Rated current (left)	The rated current output by the driver Unit: 0.1A; Range: 0-150.	U16	RW	YES	150
	02	Rated current (right)	The rated current output by the driver Unit: 0.1A; Range: 0-150.	U16	RW	YES	150
2015h	00	Number of sub indexes	Number of sub indexes	U16	RO	NO	2
	01	Maximum current (left)	Maximum current output by the driver Unit: 0.1A; Range: 0-300.	U16	RW	YES	300
	02	Maximum current (right)	Maximum current output by the driver	U16	RW	YES	300

			Unit: 0.1A; Range: 0-300.				
2016h	00	Number of sub indexes	Number of sub indexes	U16	RO	NO	2
	01	Overload protection time (left)	Driver overload protection time Unit: 10ms; Range: 0-6553.	U16	RW	YES	300
	02	Overload protection time (right)	Driver overload protection time Unit: 10ms; Range: 0-6553.	U16	RW	YES	300
2017h	00	Number of sub indexes	Number of sub indexes	U16	RO	NO	2
	01	Out-of-tolerance alarm threshold (left)	Encoder out-of-tolerance threshold Unit: *10counts; Range: 1-6553.	U16	RW	YES	409
	02	Out-of-tolerance alarm threshold (right)	Encoder out-of-tolerance threshold Unit: *10counts; Range: 1-6553.	U16	RW	YES	409
2018h	00	Number of sub indexes	Number of sub indexes	U16	RO	NO	2
	01	L velocity smoothing factor	0-30000	U16	RW	YES	50
	02	R velocity smoothing factor	0-30000	U16	RW	YES	50
2019h	00	Number of sub indexes	Number of sub indexes	U16	RO	NO	2
	01	L current loop proportional coefficient	0-30000	U16	RW	YES	600
	02	R current loop proportional coefficient	0-30000	U16	RW	YES	600
201Ah	00	Number of sub indexes	Number of sub indexes	U16	RO	NO	2
	01	L current loop integral gain	0-30000	U16	RW	YES	300
	02	R current loop integral gain		U16	RW	YES	300
201Bh	00	Number of sub indexes	Number of sub indexes	U16	RO	NO	2
	01	L feedforward output smoothing coefficient	0-30000	U16	RW	YES	100
	02	R feedforward output smoothing coefficient	0-30000	U16	RW	YES	100
201Ch	00	Number of sub indexes	Number of sub indexes	U16	RO	NO	2
	01	L torque output smoothing factor	0-30000	U16	RW	YES	100
	02	R torque output	0-30000	U16	RW	YES	100

		smoothing factor					
201Dh	00	Number of sub indexes	Number of sub indexes	U16	RO	NO	2
	01	L speed proportional gain Kp	0-30000	U16	RW	YES	500
	02	R speed proportional gain Kp	0-30000	U16	RW	YES	500
201Eh	00	Number of sub indexes	Number of sub indexes	U16	RO	NO	2
	01	L speed integral gain Ki	0-30000	U16	RW	YES	100
	02	R speed integral gain Ki	0-30000	U16	RW	YES	100
201Fh	00	Number of sub indexes	Number of sub indexes	U16	RO	NO	2
	01	L speed feedforward gain Kf	0-30000	U16	RW	YES	1000
	02	R speed feedforward gain Kf	0-30000	U16	RW	YES	1000
2020h	00	Number of sub indexes	Number of sub indexes	U16	RO	NO	2
	01	L position proportional gain Kp	0-30000	U16	RW	YES	50
	02	R position proportional gain Kp	0-30000	U16	RW	YES	50
2021h	00	Number of sub indexes	Number of sub indexes	U16	RO	NO	2
	01	L Position feedforward gain Kf	0-30000	U16	RW	YES	200
	02	R Position feedforward gain Kf	0-30000	U16	RW	YES	200
2022h	00	Number of sub indexes	Number of sub indexes	U16	RO	NO	2
	01	L speed observer coefficient 1	0-30000	U16	RW	YES	1000
	02	R speed observer coefficient 1	0-30000	U16	RW	YES	1000
2023h	00	Number of sub indexes	Number of sub indexes	U16	RO	NO	2
	01	L speed observer coefficient 2	0-30000	U16	RW	YES	750
	02	R speed observer coefficient 2	0-30000	U16	RW	YES	750
2024h	00	Number of sub indexes	Number of sub indexes	U16	RO	NO	2
	01	L speed observer coefficient 3	0-30000	U16	RW	YES	350
	02	R speed observer coefficient 3	0-30000	U16	RW	YES	350
2025h	00	Number of sub indexes	Number of sub indexes	U16	RO	NO	2
	01	L speed observer coefficient 4	0-30000	U16	RW	YES	1000
	02	R speed observer	0-30000	U16	RW	YES	1000

		coefficient 4					
2026h	00	Number of sub-indexes	Number of sub-indexes	U16	RO	NO	2
	01	Alarm PWM processing method	0: close; 1: open	U16	RW	YES	0
	02	Overload processing method	0: close; 1: open	U16	RW	YES	0
	03	I/O emergency stop processing method	0: Lock shaft; 1: Release shaft;	U16	RW	YES	0
	04	Parking mode	0: close; 1: Open;	U16	RW	YES	0
	05	Set speed resolution	1-10 (1：1RPM, 10：0.1RPM)	U16	RW	YES	1
2030h	00	Number of sub-indexes	Number of sub-indexes	U16	RO	NO	8
	01	Input terminal effective level	Bit0: input terminal X0 control bit; Bit1: input terminal X1 control bit; Bit2 ~ Bit15: maintain; 0: default; 1: level reversal; The driver defaults that the input terminal level rising edge or high level is effective;	U16	RW	YES	0
	02	Input terminal X0 terminal function selection	0: undefined; 1-6: NC;	U16	RW	YES	9
	03	Input terminal X1 terminal function selection	9: emergency stop signal;	U16	RW	YES	0
	04	Output terminal effective level	Bit0: output terminal Y0 control bit; Bit1: Y1 control bit of output terminal; Bit2: output terminal B0 control bit; Bit3: B1 control bit of output terminal; 0: default; 1: level inversion; The driver's default input terminal level rising edge or high level is valid;	U16	RW	YES	0
	05	Output terminal Y0	0: undefined	U16	RW	YES	0

		terminal function selection	1: alarm signal; 2: drive status signal; 3: In position signal; (reserve)				
	06	Output terminal Y1 terminal function selection	0: undefined 1: alarm signal; 2: drive status signal; 3: In position signal; (reserve)	U16	RW	YES	0
	07	Output terminal B0 terminal function selection	Holding brake open/close 0: open 1: close;	U16	RW	YES	0
	08	Output terminal B1 terminal function selection	Holding brake open/close 0: open 1: close;	U16	RW	YES	0
2031h	00	Software version	Factory default	U16	RO	NO	-
2032h	00	Number of sub-indexes	Number of sub-indexes	U16	RO	NO	3
	01	Motor temperature (left)	Unit: 0.1°C; Range: -550-1200°C	I16	RO	YES	-
	02	Motor temperature (right)	Unit: 0.1°C; Range: -550-1200°C	I16	RO	YES	-
	03	Driver temperature	Unit: 0.1°C; Range: -550-1200°C	I16	RO	YES	-
2033h	00	Number of sub-indexes	Number of sub-indexes	U16	RO	NO	2
	01	Motor status register (left)	Driver controls motor movement 0: motor is stationary; 1: motor is running;	U16	RO	YES	0
	02	Motor status register (right)	Driver controls motor movement 0: motor is stationary; 1: motor is running;	U16	RO	YES	0
2034h	00	Number of sub-indexes	Number of sub-indexes	U16	RO	NO	2
	01	Hall input status (left)	0-7; If 0 or 7 appears, there is Hall error.	U16	RO	YES	0
	02	Hall input status (right)	0-7; If 0 or 7 appears, there is Hall error.	U16	RO	YES	0
2035h	00	Bus voltage	Unit: 0.01V	U16	RO	YES	0
CiA 402 Parameter Group							
603Fh	00	Driver last fault code	Manufacturer customized drive error situation. High 16 bits: (left)	U32	RO	YES	0

			Low 16 bits: (right) 0x0000 0000h: No error; 0x0000 0001h: overvoltage; 0x0000 0002h: Under voltage; 0x0000 0100h: EEPROM read and write error; Left motor: 0x0000 0004h: overcurrent; 0x0000 0008h: Overload; 0x0000 0010h: Current out of tolerance; (Reserved) 0x0000 0020h: encoder out of tolerance; 0x0000 0040h: Speed out of tolerance; (Reserved) 0x0000 0080h: Reference voltage error; 0x0000 0200h: Hall error; 0x0000 0400h: Motor overtemperature 0x0000 0800h: Encoder error Right motor: 0x0004 0000h: overcurrent; 0x0008 0000h: Overload; 0x0010 0000h: Current out of tolerance; (Reserved) 0x0020 0000h: encoder out of tolerance; 0x0040 0000h: Speed out of tolerance; (Reserved) 0x0080 0000h: Reference voltage error; 0x0200 0000h: Hall error; 0x0400 0000h: Motor overtemperature 0x0800 0000h: Encoder error				
6040h	00	Control word	Control word	U16	RW	YES	0
6041h	00	Status word	Status word Low 16 represents the left motor High 16 represents the	U32	RO	YES	0

			right motor				
605Ah	00	Quick stop code	Driver processing method after quick stop command 0x00 05: stop normally, maintain quick stop state; 0x00 06: decelerate suddenly to stop, maintain quick stop state; 0x00 07: emergency stop, maintain quick stop state;	I16	RW	NO	5
605Bh	00	Close operation code	Driver processing method after close command 0x00 00: invalid; 0x00 01: stop normally, turn to ready to switch on state;	I16	RW	NO	1
605Ch	00	Disable operation code	Driver processing method after disable operation command 0x00 00: Invalid; 0x00 01: stop normally , switch to switched on state;	I16	RW	NO	1
605Dh	00	Halt control register	Driver processing method after the control word Halt command 0x00 01: stop normally, maintaining Operation Enabled state; 0x00 02: decelerate suddenly stop, maintain Operation Enabled state; 0x00 03: emergency stop, maintain Operation Enabled state;	I16	RW	NO	1
6060h	00	Operating mode	0: undefined; 1: profile position mode; 3: profile velocity mode; 4: profile torque mode;	I8	RW	YES	0
6061h	00	Operating mode status	0: undefined; 1: profile position mode; 3: profile velocity mode; 4: profile torque mode;	I8	RO	YES	0
6064h	00	Number of sub-indexes	Number of sub-indexes	U16	RO	NO	2
	01	Actual position feedback (left)	Actual position feedback, unit: counts;	I32	RO	YES	0

	02	Actual position feedback (right)	Actual position feedback, unit: counts;	I32	RO	YES	0
606Ch	00	Number of sub-indexes	Number of sub-indexes	U16	RO	NO	2
	01	Actual speed feedback (left)	Current motor speed, Unit: 0.1r/min	I32	RO	YES	0
	02	Actual speed feedback (right)	Current motor speed, Unit: 0.1r/min	I32	RO	YES	0
	03	Left and right actual speed combination Low 16 represents the left motor High 16 represents the right motor	Current motor speed, Unit: 0.1r/min	U32(I16+ I16)	RO	YES	0
6071h	00	Number of sub-indexes	Number of sub-indexes	U16	RO	NO	2
	01	Target torque (left)	Unit: mA; Range: -30000~30000;	I16	RW	YES	0
	02	Target torque (right)	Unit: mA; Range: -30000~30000;	I16	RW	YES	0
	03	Left and right target torque combination Low 16 represents the left motor High 16 represents the right motor	Unit: mA; Range: -30000~30000;	U32(I16+ I16)	RW	YES	0
6077h	00	Number of sub-indexes	Number of sub-indexes	U16	RO	NO	2
	01	Real-time torque (left)	Unit: 0.1A; Range:-600~600;	I16	RO	YES	0
	02	Real-time torque (right)	Unit: 0.1A; Range:-600~600;	I16	RO	YES	0
	03	Left and right real-time torque combination Low 16 represents the left motor High 16 represents the right motor	Unit: 0.1A; Range:-600~600;	U32(I16+ I16)	RO	YES	0
607Ah	00	Number of sub-indexes	Number of sub-indexes	U16	RO	NO	2
	01	Target position (left)	Range of total pulses in position mode operation: Relative: -0x7FFFFFFF~0x7FFFFFFF Absolute: -0x3FFFFFFF~0x3FFFFFFFFF	I32	RW	YES	0
	02	Target position (right)	Range of total pulses in position mode operation:	I32	RW	YES	0

			Relative: -0x7FFFFFFF~0x7FFFFFFF Absolute: -0x3FFFFFFF~0x3FFFFFFFFF				
6081h	00	Number of sub-indexes	Number of sub-indexes	U16	RO	NO	2
	01	Max speed (left)	Speed in profile position mode; Range: 1-1000r/min;	U32	RW	YES	120r/min
	02	Max speed (right)	Speed in profile position mode; Range: 1-1000r/min;	U32	RW	YES	120r/min
6082h	00	Number of sub-indexes	Number of sub-indexes	U16	RO	NO	2
	01	Start / stop speed in profile position mode (left)	Start / stop speed in profile position mode; Range: 1-250r/min;	U32	RW	YES	1r/min
	02	Start / stop speed in profile position mode (right)	Start / stop speed in profile position mode; Range: 1-250r/min;	U32	RW	YES	1r/min
6083h	00	Number of sub-indexes	Number of sub-indexes	U16	RO	NO	2
	01	S-shaped acceleration time (left)	acceleration time; Range: 0-32767ms;	U32	RW	YES	500ms
	02	S-shaped acceleration time (right)	acceleration time; Range: 0-32767ms;	U32	RW	YES	500ms
6084h	00	Number of sub-indexes	Number of sub-indexes	U16	RO	NO	2
	01	S-shaped deceleration time (left)	Deceleration time; Range: 0-32767ms;	U32	RW	YES	500ms
	02	S-shaped deceleration time (right)	Deceleration time; Range: 0-32767ms;	U32	RW	YES	500ms
6085h	00	Number of sub-indexes	Number of sub-indexes	U16	RO	NO	2
	01	Emergency stop deceleration time (left)	Deceleration time; Range: 0-32767ms;	U32	RW	YES	10
	02	Emergency stop deceleration time (right)	Deceleration time; Range: 0-32767ms;	U32	RW	YES	10
6087h	00	Number of sub-indexes	Number of sub-indexes	U16	RO	NO	2
	01	Torque slope (left)	Current/1000/second; Unit: mA/s;	U32	RW	YES	300
	02	Torque slope (right)	Current/1000/second; Unit: mA/s;	U32	RW	YES	300
60FFh	00	Number of sub-indexes	Number of sub-indexes	U16	RO	NO	2
	01	Target speed (left)	Target speed in profile velocity mode; Range: -1000~1000r/min;	I32	RW	YES	0
	02	Target speed (right)	Target speed in profile velocity mode;	I32	RW	YES	0

	03	Left and right target speed combination Low 16 represents the left motor High 16 represents the right motor	Range: -1000~1000r/min; The current movement speed of the motor, units: 1 r/min	U32(I16+ I16)	RO	YES	0

Note:

- U16 means unsigned 16 bits; I16 means signed 16 bits; U32 means unsigned 32 bits; I32 means signed 32 bits.

Attention:

Alarm PWM processing method: After the driver enters the alarm state, the upper tube is closed and the lower tube is opened (short-circuit the three power lines of the motor).

Overload handling method: such as motor I^2t If the time t is 20 seconds, the duration of double overload is 6 seconds, and the duration of triple overload is 4 seconds.