ADMPOWER

RS485 Modbus/RTU

NEMA8 - NEMA23 Size Integrated Stepper Motor RS485 Communication Controller User Mnaul

RS485 Communication protocol

1. RS485 Function

The driver is equipped with an industrial grade bus communication chip, and any industrial equipment with RS485 communication function can directly control the operation of the driver according to the Modbus RTU protocol. If necessary, up to 64 drives can be c onnected in series to achieve reliable construction of medium to large drive networks at a lower cost.

2. Baud Rate and Communication Distance

Baud Rate (bps)	Communication Distance (m)
9600	1000
19200	1000
38400	1000
57600	800
115200	500
256000	250

Due to external interference and differences in the number of bus nodes,
The actual communication speed and distance on site may vary to some extent

3. Modbus-RTU/RS485

Modbus-RTU/RS485 Protocol, This manual only introduces the protocol and standard content related to the use of the driver.

4. Communication Parameters

Baud rate: 115200(default)

Data bits：8

Stop bit：1

Parity：none

5. Address

0 is Broadcast address, all child nodes can recognize the broadcast address, but do not send return messages.

1~64 Node RTU address (refers to the driver). Child nodes can be added according to customer needs, Max. quantity: 64.

6. Function Code

Function Code	Definition	Format
0x03	Read Single/Mulit Register	WORD/DWORD/QWORD
0x06	Write Single Register	WORD
0x10	Write Mulit Register	WORD/DWORD/QWORD

Data: Contains the register address and value that need to be operated.

CRC Verification code

Operation	Data Frame						
Read Register 0x03	Request	Driver ID	Code	Register Address		number of register	CRC
		1 Byte	0x03	2 Byte		2 Byte	2 Byte
	Response	Driver ID	Code	Register Address		Return data	CRC
		1 Byte	0x03	1 Byte		2 Byte	2 Byte
Write Register 0x06	Request	Driver ID	Code	Register Address		Write Data	CRC
		1 Byte	0x06	2 Byte		2 Byte	2 Byte
	Response	Driver ID	Code	Register Address		Written Data	CRC
		1 Byte	0x06	2 Byte		2 Byte	2 Byte
Write Muliti register 0x10	Request	Driver ID	Code	Register Address	number of register	Write Data	Write Data CRC
		1 Byte	0x10	2 Byte	2 Byte	1 Byte	2n Byte 2 Byte
	Response	Driver ID	Code	Register Address		number of register	CRC
		1 Byte	0x10	2 Byte		2 Byte	2 Byte

Note: CRC verification is in low byte order format, while others are in high byte order format

7.Register Address

Address	Type	Description	Default	Attribute	Unit
0x0000 0x0001	STRING	Hardware version	Definined by Model No	RO	-
0x0002 0x0003	STRING	Firmware version	Definined by Model No	RO	-
0x0004 0x0005	INT32	Real time position of Motor	-	RO	pulses
0x0006 0x0007	UINT32	Status of Register	-	RO	-
0x0008	UINT16	Serial port timeout setting	0	RW	ms
0x0009	UINT16	Baud Rate	12	RW	-
0x000A	UINT16	Smooth constant (pulse delay))	250	RW	Open loop
0x000B	UINT16	Dynamic error alarm threshold	200	RW	Full step(1.8°)
0x000C	UINT16	Static error alarm threshold	100	RW	Full step(1.8°)
0x000D	UINT16	Rated Current	Definined by Model No	RW	0.01A
0x000E	UINT16	Set Current percentage		RW	%
0x000F	UINT16	Number of encoder lines	1000	RW	CPR
0x0010	UINT16	Position deviation warning	20	RW	Full step(1.8°)
0x0011	UINT16	Actual position deviation	-	RW	pulses
0x0013	UINT16	Filter frequency	425K	RW	HZ
0x0015	UINT16	Execution position of program command	0	RO	-
0x0016	UINT16	Dynamic maximum speed	-	RW	rpm
0x0017	UINT16	Minimum number of encoder lines	200	RW	CPR
0x0019	INT16	Real time speed	-	RO	rpm
0x001A	UINT16	Real time Current	-	RO	mA
0x001B	UINT16	Input 0 Delay setting	2	RW	ms
0x001C	UINT16	Input 1 Delay setting	2	RW	ms
0x001D	UINT16	Input 2 Delay setting	2	RW	ms
0x001E	UINT16	Input 3 Delay setting	2	RW	ms
0x001F	UINT16	Input 4 Delay setting	2	RW	ms
0x0020	UINT16	Input 5 Delay setting	2	RW	ms
0x0021	UINT16	Input 6 Delay setting	2	RW	ms
0x0022	UINT16	Input 7 Delay setting	2	RW	ms
0x0024 0x0025	UINT32	Subdivision	4000	RW	pulses/rev
0x0026	UINT16	Motor Inductance	Power on detection	RW	mH
0x0027	UINT16	Motor Resistance	Power on detection	RW	Ω
0x002C	UINT16	SW 1st Speed	5	RW	rpm
0x002D	UINT16	SW 2nd Speed	10	RW	rpm
0x002E	UINT16	SW 3rd Speed	15	RW	rpm
0x002F	UINT16	SW 4th Speed	30	RW	rpm
0x0030	UINT16	SW 5th Speed	60	RW	rpm
0x0031	UINT16	SW 6th Speed	90	RW	rpm
0x0032	UINT16	SW 7th Speed	120	RW	rpm
0x0033	UINT16	SW 8th Speed	150	RW	rpm
0x0044	UINT16	Maximum value of bus voltage	-	RW	0.01V
0x0045	UINT16	Maximum value of over-current	-	RW	0.01A
0x0046	UINT16	Maximum number of lagging pulses	-	RW	pulses
0x0047	UINT16	Maximum number of leading pulses	-	RW	pulses
0x0048	UINT16	Minimum value of bus voltage	-	RW	0.01V
0x0066	UINT16	Driver ID	1	RW	-
0x006B	UINT16	Motor rotation direction	0	RW	CW
0x006C	UINT16	Reverse port level	0	WO	-
0x006E 0x006F	INT32	Negative limit Setting	-2147483648	RW	pulses
0x0070 0x0071	INT32	Positive limit Setting	2147483647	RW	pulses

Address	Type	Description	Default	Attribute	Unit
0x0096	UINT16	Start Speed	50	RW	rpm
0x0097	UINT16	Stop Speed	50	RW	rpm
0x0098	UINT16	Acceleration time	120	RW	ms
0x0099	UINT16	Deceleration time	120	RW	ms
0x009A	UINT16	Working Speed	300	RW	rpm
0x009B	UINT16	Limit set /cancel	-	RW	-
0x009C	UINT16	Enable Home set/cancel	-	RW	-
0x009D	UINT16	Secondary Home setting	-	RW	-
0x009E	UINT16	Constant torque Setting	-	RW	-
0x009F	UINT16	Set Working mode	3	RW	-
0x00A0	UINT16	Open Output port	-	WO	-
0x00A1	UINT16	Close Output port	-	WO	-
0x00A2	UINT16	Read Output satus	-	RO	-
0x00A3	UINT16	Read alarm status	-	RO	-
0x00A4	UINT16	Clear alarm status	-	WO	-
0x00A5	UINT16	Set alarm-output port	257	RW	-
0x00A6	UINT16	Set dynamic-output port	514	RW	-
0x00A7	UINT16	Set in-position-output port	514	RW	-
0x00A8 0x00A9	INT32	Position reminder register(X11)	-	RW	pulses
0x00AA	UINT16	Set Table Size	-	RW	-
0x00AB	UINT16	Set Table Pointer	-	RW	-
0x00AC	UINT16	Set Table Start address	-	RW	-
0x00AD	UINT16	Set emergency-stop to specified input port	-	RW	-
0x00AE	UINT16	Set home-completed to specified output port	-	RW	-
0x00AF	UINT16	Set Speed-switching to specified input port	-	RW	-
0x00B0	UINT16		-	RW	-
0x00B1	UINT16		-	RW	-
0x00B2	UINT16		-	RW	-
0x00B3	UINT16	Switch to Speed1	0	RW	rpm
0x00B4	UINT16	Switch to Speed2	0	RW	rpm
0x00B5	UINT16	Switch to Speed3	0	RW	rpm
0x00B8	UINT16	Switch to Speed4	0	RW	rpm
0x00B6 0x00B7	UINT32	Set dynamic positioning	0	RW	-
0x00BA 0x00BB	UINT32	Set IO function	-	RW	-
0x00BE	INT16	Rotor offset	0	RW	1/4000 DEG
0x00BF	UINT16	Position proportion	100	RW	-
0x0029	UINT16	Position integral	100	RW	-
0x00C0	UINT16	Speed proportion	3200	RW	-
0x00C1	UINT16	Speed integral	25	RW	-
0x00C2 0x00C3	INT32	Position reminder register(X17)	1073741823	RW	-
0x00C4 0x00C5	INT32	Position reminder register(X18)	1073741823	RW	-
0x00C6 0x00C7	INT32	Position reminder register(X19)	1073741823	RW	-
0x00C8	UINT16	Working/Stop	-	WO	-
0x00C9	UINT16	Start-Homing Register	-	WO	-
0x00CA	UINT16	Motor Jogging	-	WO	-
0x00CB	UINT16	Start Constant Torque	-	WO	-
0x00CC 0x00CD	INT32	Motor Running Time	-	WO	ms
0x00CE 0x00CF	INT32	Motor running pulse count (Must be in a stopped state)	-	WO	pulses

Address	Type	Description	Default	Attribute	Unit
0x00D0 0x00D1	INT32	Motor runs to the absolute position (Must be in a stopped state)	-	WO	pulses
0x00D2 0x00D3	INT32	Set current position	0	RO	pulses
0x00D4	UINT16	Disable/Enable/Restart	-	WO	-
0x00D6 0x00D7	INT32	Real time speed	0	RO	0.01rmp
0x00D8 0x00D9	INT32	Actual speed	30000	RW	0.01rmp
0x00DB	UINT16	Execute programming commands	-	WO	-
0x00DC	UINT16	Save Parameters	-	WO	-
0x00DD	UINT16	Execute Table data register	-	WO	-
0x00DE	INT32	Motor running pulse count	-	WO	pulses
0x00DF 0x00E8	INT32 INT32	Motor running pulse count Motor runs to the absolute position	- -	WO WO	pulses pulses
0x00E9	INT32	Motor runs to the absolute positioin	-	WO	pulses

8. Register Explanation

1. Hardware version

Add: 0x0000~0x0001

Name: version number

Attri: ReadDWORD

BIT	name	type	range	default	Description
0~31	driver model no.	String	0~4294967295	default value	Read Driver name

Registers are fixed at the factory and their values are converted to ASCII code, which is the actual version number

Example:

Read	Request	ID	Func. Code	Start Register Address (High bit)	Start Register Address (Low bit)	Number of Regiser (High bit)	Number of Regiser (Low bit)	CRC		
		01	03	00	00	00	02	C4	0B	
	Response	ID	Func. Code	Number of byte	Register value (High bit)	Register value (Low bit)	Register value (High bit)	Register value (Low bit)	CRC	
		01	03	04	37	31	00	30	A5	9C

2. Firmware version

Add: 0x0002~0x0003

Name: Firmware Version

Attri: ReadDWORD

BIT	name	type	range	default	Description
0~31	driver model no.	String	0~4294967295	default value	Read Driver name

Registers are fixed at the factory and their values are converted to ASCII code, which is the actual version number

Example:

Read	Request	ID	Func. Code	Start Register Address (High bit)	Start Register Address (Low bit)	Number of Regiser (High bit)	Number of Regiser (Low bit)	CRC		
		01	03	00	02	00	02	65	CB	
	Response	ID	Func. Code	Number of byte	Register value (High bit)	Register value (Low bit)	Register value (High bit)	Register value (Low bit)	CRC	
		01	03	04	30	31	00	35	64	EB

3. Real time position of Motor

Add: 0x0004~0x0005

Name: Current absolute position(if Closed Loop means Encoder position)

Attri: ReadDWORD

BIT	name	type	range	default	Description
0~31	driver model no.	String	0~4294967295	default value	Read Driver name

Example:

Read	Request	ID	Func. Code	Start Register Address (High bit)	Start Register Address (Low bit)	Number of Regiser (High bit)	Number of Regiser (Low bit)	CRC		
		01	03	00	04	00	02	85	CA	
	Response	ID	Func. Code	Number of byte	Register value (High bit)	Register value (Low bit)	Register value (High bit)	Register value (Low bit)	CRC	
		01	03	04	00	00	00	00	FA	33

4. Status of the registers

Add：0x0006~0x0007

Name：Status of the motor and Input

Attri：ReadWORD

BIT	Name	Type	range	default	Description
21~31	reserved X20~X31	BIT	0	0	Reserved，value: 0
20	Position deviation warningX20	BIT	0~1	0	1:Negative deviation, 0:positive deviation
19	Position Reminder X19	BIT	0~1	0	Can be set to be greater than or less than 1 when exceeding the position, value is 1
18	Position Reminder X18	BIT	0~1	0	
17	Position Reminder X17	BIT	0~1	0	
16	Enable Level X16	BIT	0~1	0	1: High level, 0: Low level
15	Home Completed X15	BIT	0~1	0	1: At home position, 0: Not at home position
14	Positive Limit X14	BIT	0~1	0	1: reach the limit
13	Negative Limit X13	BIT	0~1	0	1: reach the limit
12	In-place output X12	BIT	0~1	0	1: in place, 0: running
11	Position reminder X11	BIT	0~1	0	1: exceeding the position, other value you set
10	Position deviation X10	BIT	0~1	0	1: when rotor position and command position exceed the set-value of 0x0010
9	Status of X8,X9	BIT	0~1	0	00: Motor idle, 01: About to start, 10: About to stop, 11: Running
8		BIT	0~1	0	
7	X7 Input Status	BIT	0~1	0	X7 Status，1: high level input，0: no input
6	X6 Input Status	BIT	0~1	0	X6 Status，1: high level input，0: no input
5	X5 Input Status	BIT	0~1	0	X5 Status，1: high level input，0: no input
4	X4 Input Status	BIT	0~1	0	X4 Status，1: high level input，0: no input
3	X3 Input Status	BIT	0~1	0	X3 Status，1: high level input，0: no input
2	X2 Input Status	BIT	0~1	0	X2 Status，1: high level input，0: no input
1	X1 Input Status	BIT	0~1	0	X1 Status，1: high level input，0: no input
0	X0 Input Status	BIT	0~1	0	X0 Status，1: high level input，0: no input

Example: when X1 input, Motor is running:

Read	Request	ID	Func. Code	Start Register Address (High bit)	Start Register Address (Low bit)	Number of Regiser (High bit)	Number of Regiser (Low bit)	CRC	
		01	03	00	06	00	02	24	0A
	Response	ID	Func. Code	Number of byte	Register value (High bit)	Register value (Low bit)	Register value (High bit)	Register value (Low bit)	CRC
		01	03	04	18	00	02	00	7D 52

5 Serial port timeout setting:

Add：0x0008

Name：Serial port timeout setting, if Exceeding the set value means offline, 0 means cancel.

Attri：ReadWORD/ WriteWORD,Record(if sent comand for save-parameters)

BIT	Name	Type	Range	Default	Description
0~15	Timeout time	UINT16	0~65535	Record value	RW: timeout time, default:0, Unit:10ms

Example: Read Serial port timeout time:

Read	Request	ID	Func. Code	Start Register Address (High bit)	Start Register Address (Low bit)	Number of Regiser (High bit)	Number of Regiser (Low bit)	CRC	
		01	03	00	08	00	01	05	C8
	Response	ID	Func. Code	Number of byte	Register value (High bit)	Register value (Low bit)	CRC		
		01	03	02	00	00	B8	44	

Set timeout time: 100ms(100/10, value: 0x000A)

Write	Request/ Response	ID	Func. Code	Start Register Address (High bit)	Start Register Address (Low bit)	Number of Regiser (High bit)	Number of Regiser (Low bit)	CRC	
		01	06	00	08	00	0A	88	OF

6. Set Baud Rate

Add：0x0009

Name：Set baud rate

Attri：ReadWORD/ WriteWORD,Record(if sent comand for save-parameters)

BIT	Name	Type	Range	Default	Description
0~15	Baud rate	UINT16	1~15	Record value	RW: Baud rate, default 115200

baud rate:

1=300、2=600、3=1200、4=2400、5=4800、6=9600、7=14400、8=19200、9=38400、10=56000、11=57600、 12=115200、13=230400、14=460800、15=921600 Example: read baud rage: 0x000C, 12 means 115200

		ID	Func. Code	Start Register Address (High bit)	Start Register Address (Low bit)	Number of Regiser (High bit)	Number of Regiser (Low bit)	CRC	
Read	Request	01	03	00	09	00	01	54	08
	Response	ID	Func. Code	Number of byte	Register value (High bit)	Register value (Low bit)	CRC		
		01	03	02	00	0C	B8	41	

Set baud rate: 9600, means 0x0006:

		ID	Func. Code	Start Register Address (High bit)	Start Register Address (Low bit)	Number of Regiser (High bit)	Number of Regiser (Low bit)	CRC	
Write	Request/ Response	01	06	00	09	00	06	D9	CA

Note: The setting takes effect immediately, and you need to save parameters. Otherwise the baud rate is still: factory default value 115200.

7. Smooth constant (pulse delay))

Add：0x000A

Name：Smooth constant (pulse delay))

Attri：ReadWORD/ WriteWORD,Record(if sent comand for save-parameters)

BIT	Name	Type	range	default	Description
0~15	Smooth constant	UINT16	1~2500	Record value	RW: smooth constant, 250: Open loop(default), 25: Closed loop

The smaller the value, the better the smoothness, the longer the pulse delay, and the slower the response;

The larger the value, the worse the smoothness, the smaller the pulse delay, and the faster the response.

Pulse delay (ms)=1000 ÷ smooth constant, Example: Read default smooth constant 0x00FA, 4ms

		ID	Func. Code	Start Register Address (High bit)	Start Register Address (Low bit)	Number of Regiser (High bit)	Number of Regiser (Low bit)	CRC	
Read	Request	01	03	00	0A	00	01	A4	08
	Response	ID	Func. Code	Number of byte	Register value (High bit)	Register value (Low bit)	CRC		
		01	03	02	00	FA	38	07	

Set smooth constant: 0x03E8(1000), means delay 1ms(1000/1000):

		ID	Func. Code	Start Register Address (High bit)	Start Register Address (Low bit)	Number of Regiser (High bit)	Number of Regiser (Low bit)	CRC	
Write	Request/ Response	01	06	00	0A	03	E8	A9	76

8. Dynamic error alarm threshold

Add：0x000B

Name：Set the alarm threshold for position error (only valid for closed-loop)

Attri：ReadWORD/ WriteWORD,Record(if sent comand for save-parameters)

BIT	Name	Type	range	default	Description
0~15	set alarm threshold position error	UINT16	0~65535	record value	alarm output when reach rated value, 0: cancel, unit: 1.8°

Example: Read default value: 0x00C8(200) means 200*1.8= 360°

		ID	Func. Code	Start Register Address (High bit)	Start Register Address (Low bit)	Number of Regiser (High bit)	Number of Regiser (Low bit)	CRC	
Read	Request	01	03	00	0B	00	01	F5	C8
	Response	ID	Func. Code	Number of byte	Register value (High bit)	Register value (Low bit)	CRC		
		01	03	02	00	C8	B9	D2	

Set alarm-output threshold is 0x0064(100), means 100*1.8=180°

		ID	Func. Code	Start Register Address (High bit)	Start Register Address (Low bit)	Number of Regiser (High bit)	Number of Regiser (Low bit)	CRC	
Write	Request/ Response	01	06	00	0B	00	64	F9	E3

9. Static error alarm threshold

Add：0x000C

Name：Set the position error alarm threshold In the stopped state(only valid for closed-loop)

Attri：ReadWORD/ WriteWORD,Record(if sent comand for save-parameters)

BIT	Name	Type	Range	default	Description
0~15	position error threshold	UINT16	0~65535	record value	alarm output when reach rated value, 0: cancel, unit: 1.8°

Example：Read the default value. 0x00C8(100) means 100*1.8= 180°

Request: 01 03 00 0C 00 01 44 09

Response: 01 03 02 00 C8 B9 D2

In the stopped state, set the alarm threshold to 0x0032(50) means, 50*1.8=90 ° to trigger alarm output;

Request: 01 06 00 0C 00 32 C8 1C

Response: 01 06 00 0C 00 32 C8 1C

10. Rated Current

Add：0x000D

Name：Set Rated Current

Attri：ReadWORD/ WriteWORD,Record(if sent comand for save-parameters)

BIT	Name	Type	Range	Default	Description
0~15	Set Rated Current	UINT16	10~650	Record Value	Write: Rated current, unit: 0.01A

Example: Read the default value: 0x0064(100) means 100*0.01A=1A

Request: 01 03 00 0D 00 01 15 C9

Response: 01 03 02 00 64 B9 AF

Set rated current 0x01F4(500), means 500*0.01A= 5A

Request: 01 06 00 0D 01 F4 18 1E

Response: 01 06 00 0D 01 F4 18 1E

11. Set Current percentage

Add：0x000E

Name：Set the percentage of idle current and minimum operating current of the motor

Attri：ReadWORD/ WriteWORD,Record(if sent comand for save-parameters)

	BIT	Name	Type	range	default	Description
Open loop	15~8	Reserved	BIT	1~100	0	Reserved
	7~ 0	percentage of idle current	BIT	1~100	Value	percentage of idle current of the motor
Closed loop	15~8	% of Min.operating current	BIT	1~100	Value	percentage of minimum operating current of the motor
	7~ 0	percentage of idle current	BIT	1~100	Value	percentage of idle current of the motor

Example：Closed Loop, read the default value 0x1919(0x19:25), means idle current percentage: 25%, Min. operating curent: 25%.

Request: 01 03 00 0E 00 01 EF C9

Response: 01 03 02 19 19 72 1E

Set current percentage: Min. operating current: 25%, idle current: 50%, 25(0x19), 50(0x32), means 0x1932

Request: 01 06 00 0E 19 32 62 4C

Response: 01 06 00 0E 19 32 62 4C

12. number of encoder line

Add：0x000F

Name：set encoder line(closed loop only)

Attri：ReadWORD/ WriteWORD,Record(save parameters)

BIT	Name	Type	range	default	Description
0~15	number of encoder line	UINT16	1~65535	record value	RW: number of encoder line, unit: line

Encoder resolution=number of encoder lines x 4

Example: Read the default number of encoder line: 1000(0x03e8), means 1000*4=4000 pulses/r

Request： 01 06 00 0F 09 C4 BE 0A

Response：01 03 02 03 E8 B8 FA

Set encoder line: 2500(0x09C4), means 2500*4 =10000 pulses/r

Request： 01 06 00 0F 09 C4 BE 0A

Response：01 06 00 0F 09 C4 BE 0A

13. Position deviation warning

Add：0x0010

Name: Set the rotor position and command position deviation, when value exceeded, X10 value is 1 (status register).

Attri：ReadWORD/ WriteWORD,Record(save parameters)

BIT	Name	Type	range	default	Description
0~15	position deviation value	UINT16	1~65535	record value	RW:Position deviation warning value: 20(default), unit:1.8°

Example: Read the position deviation waring default value, 20(0x14) means 20*1.8° =36°

Request： 01 03 00 10 00 01 85 CF

Response：01 03 02 00 14 B8 4B

Set the position deviation warning value: 100(0x0064) , means 100*1.8° =180°

Request： 01 06 00 10 00 64 89 E4

Response：01 06 00 10 00 64 89 E4

14. Actual position deviation

Add：0x0011

Name：rotor position and command position Actual deviation

Attri：ReadWORD

BIT	Name	Type	range	default	Description
0~15	Actual position deviation	INT16	-32768~32767	record value	Read:The actual deviation between the rotor position and the command position. Unit: 0.01 pulses

Positive numbers represent leading pulses, while negative numbers represent lagging pulses.

Example：read the actual deviation between rotor position and command position, Result is 0:

Request： 01 03 00 11 00 01 D4 0F

Response：01 03 02 00 00 B8 44.

15. Register warning status

Add：0x0012

Name：Status of the motor

Attri：ReadWORD

BIT	Name	type	range	default	Description
15	reserved	BIT	0~1	0	reserved, constant value:0
14	reserved	BIT	0~1	0	reserved, constant value:0
13	reserved	BIT	0~1	0	reserved, constant value:0
12	reserved	BIT	0~1	0	reserved, constant value:0
11	reserved	BIT	0~1	0	reserved, constant value:0
10	reserved	BIT	0~1	0	reserved, constant value:0
9	reserved	BIT	0~1	0	reserved, constant value:0
8	reserved	BIT	0~1	0	reserved, constant value:0
7	reserved	BIT	0~1	0	reserved, constant value:0
6	reserved	BIT	0~1	0	reserved, constant value:0
5	Release the brake when offline	BIT	0~1	0	Release the brake when offline，0:Allow, 1:prohibit
4	Enable when power-on	BIT	0~1	0	Power on status：0: Eanble, 1: Disable
3	Test mode	BIT	0~1	0	Enter Test mode：0: Allow, 1: Prohibit
2	Under voltage Reset	BIT	0~1	0	under voltage rest：0: Allow, 1: Prohibit
1	under voltage alarm	BIT	0~1	0	under voltage alarm：0: Allow, 1: Prohibit
0	phase open-circuit alarm	BIT	0~1	0	phase open circuit alarm：0: Allow, 1: Prohibit

Example: Read the default value, result as below:

Request: 01 03 00 12 00 01 24 0F

Response: 01 03 02 00 00 B8 44.

Set phase open-circuit alarm: Prohibit and Enter test mode: Prohibit

Request: 01 06 00 12 00 09 E9 C9

Response: 01 06 00 12 00 09 E9 C9

0x09=0b1001, bit0=1 bit3=1

16. Execution position of program command

Add：0x0015

Name：Command execution position in programming area

Attri：ReadWORD

BIT	Name	Type	range	default	Description
0~15	command execution position	UINT16	1~4095	Memory value	Read: Command execution position in programming area

Example: programming area exectue poistion command

Request: 01 03 00 15 00 01 95 CE

Response: 01 03 02 00 00 B8 44

17. Dynamic maximum speed

Add：0x0016

Name：Maximum working speed

Attri：ReadWORD/ WriteWORD

BIT	Name	Type	range	default	Description
0~15	Dynamic maximum speed	UINT16	0~65535	memory value	Read: Max. working speed, Write 0 to celar, unit: RPM

The Max.speed during operation may change at any time, only the readed maximum value is displayed,

Can write 0 to clear the current maximum value for Re-reading.

Example: Read the current Max. working speed(RPM)

Request: 01 03 00 16 00 01 65 CE

Response: 01 03 02 00 27 F8 5E

Clear maximum speed record value

Request: 01 06 00 16 00 00 68 0E

Response: 01 06 00 16 00 00 68 0E

18.Minimum number of encoder lines(Switch Open/Closed loop)

Add：0x0017

Name：Set the Min. number of lines for the encoder (only valid for closed-loop), If the actual number of encoders is less than it, Switch to open-loop

Attri：ReadWORD/ WriteWORD, Memory value(saved parameters)

BIT	Name	Type	Range	Default	Description
0~15	Min. Encoder resolution	UINT16	1~65535	Memory value	RW: resolution of Encoder, default Min. value: 50, Unit: line

Example: Read the default value: 200(0xc8)

Request： 01 03 00 17 00 01 34 0E

Response：01 03 02 00 C8 B9 D2

Assuming the actual number of encoder lines is 1000, if Switch to Open loop, just set the Min. number of encoder lines >1000, for example: change it to 2000(0x07D0)

Request： 01 06 00 17 07 D0 3A 62

Response：01 06 00 17 07 D0 3A 62

19. Read Real time Speed

Add：0x0019

Name：Read real time speed(Open loop: pulse speed, Closed loop: rotor speed)

Attri：ReadWORD

BIT	Name	Type	range	default	description
0~15	real time speed	INT16	-32768~32767	0	Read real time speed, - means CCW, positive means CW, Unit: RPM

Example: Real time speed is 0 (in stationary state)

Request： 01 03 00 19 00 01 55 CD

Response：01 03 02 00 00 B8 44

20. Real time Current

Add：0x001A

Name：Read the Real time Current

Attri：ReadWORD

BIT	Name	Type	range	default	description
0~15	Real time Current	UINT16	0~65535	0	Read real time speed, unit: mA

Example: Read the real time current:

Request： 01 03 00 1A 00 01 A5 CD

Response：01 03 02 02 0D 78 E1

Note: The current value is constantly changing, so each reading result should be different.

Example: read the default value 2:

Request： 01 03 00 1B 00 01 F4 0D

Response：01 03 02 00 02 39 85

Request： 01 06 00 1B 00 32 78 18

Response：01 06 00 1B 00 32 78 18

22. Input 1 delay setting

Add：0x001C

Name：Input X1,Signal reception delay time setting

Attri: ReadWORD/ WriteWORD, Memory value(saved parameters)

BIT	Name	Type	range	default	Description
0~15	X1 reception delay	UINT16	0~65535	memory value	RW: X1 signal receptoin dealy time, unit: ms

Example: read the default value 2:

Request: 01 03 00 1C 00 01 45 CC

Response: 01 03 02 00 02 39 85

Set X1 Signal reception dealy is 50(0x32)ms

Request: 01 06 00 1C 00 32 C9 D9

Response: 01 06 00 1C 00 32 C9 D9

23. Input 2 delay setting

Add：0x001D

Name：Input X2,Signal reception delay time setting

Attri: ReadWORD/ WriteWORD, Memory value(saved parameters)

BIT	Name	Type	range	default	Description
0~15	X2 reception delay	UINT16	0~65535	memory value	RW: X2 signal receptoin dealy time, unit: ms

Example: read the default value 2:

Request: 01 03 00 1D 00 01 14 0C

Response: 01 03 02 00 02 39 85

Set X2 Signal reception dealy is 50(0x32)ms

Request: 01 06 00 1D 00 32 98 19

Response: 01 06 00 1D 00 32 98 19

24. Input 3 delay setting

Add：0x001E

Name：Input X3,Signal reception delay time setting

Attri: ReadWORD/ WriteWORD, Memory value(saved parameters)

BIT	Name	Type	range	default	Description
0~15	X3 reception delay	UINT16	0~65535	memory value	RW: X3 signal receptoin dealy time, unit: ms

Example: read the default value 2:

Request: 01 03 00 1E 00 01 E4 0C

Response: 01 03 02 00 02 39 85

Set X3 Signal reception dealy is 150(0x96)ms

Request: 01 06 00 1E 00 96 69 A2

Response: 01 06 00 1E 00 96 69 A2

25. Input 4 delay setting

Add：0x001F

Name：Input X4,Signal reception delay time setting

Attri: ReadWORD/ WriteWORD, Memory value(saved parameters)

BIT	Name	Type	range	default	Description
0~15	X4 reception delay	UINT16	0~65535	memory value	RW: X4 signal receptoin dealy time, unit: ms

Example: read the default value 2:

Request： 01 03 00 1F 00 01 B5 0C

Response：01 03 02 00 02 39 85

Set X3 Signal reception dealy is 200(0xc8)ms

Request： 01 06 00 1F 00 C8 B9 9A

Response：01 06 00 1F 00 C8 B9 9A

26. Input 5 delay setting

Add：0x0020

Name：Input X5,Signal reception delay time setting

Attri: ReadWORD/ WriteWORD, Memory value(saved parameters)

BIT	Name	Type	range	default	Description
0~15	X5 reception delay	UINT16	0~65535	memory value	RW: X5 signal receptoin dealy time, unit: ms

Example: read the default value 2:

Request： 01 03 00 20 00 01 85 C0

Response：01 03 02 00 02 39 85

Set X3 Signal reception dealy is 250(0xFA)ms

Request： 01 06 00 20 00 FA 08 43

Response：01 06 00 20 00 FA 08 43

27. Input 6 delay setting

Add：0x0021

Name：Input X6,Signal reception delay time setting

Attri: ReadWORD/ WriteWORD, Memory value(saved parameters)

BIT	Name	Type	range	default	Description
0~15	X6 reception delay	UINT16	0~65535	memory value	RW: X6 signal receptoin dealy time, unit: ms

Example: read the default value 2:

Request： 01 03 00 21 00 01 D4 00

Response：01 03 02 00 02 39 85

Set X3 Signal reception dealy is 300(0x12C)ms

Request： 01 06 00 21 01 2C D9 8D

Response：01 06 00 21 01 2C D9 8D

28. Input 7 delay setting

Add：0x0022

Name：Input X7,Signal reception delay time setting

Attri: ReadWORD/ WriteWORD, Memory value(saved parameters)

BIT	Name	Type	range	default	Description
0~15	X7 reception delay	UINT16	0~65535	memory value	RW: X7 signal receptoin dealy time, unit: ms

Example: read the default value 2:

Request: 01 03 00 22 00 01 24 00

Response: 01 03 02 00 02 39 85

Set X3 Signal reception dealy is 500(0x1F4)ms

Request: 01 06 00 22 01 F4 29 D7

Response: 01 06 00 22 01 F4 29 D7

29. Subdivision

Add：0x0024~0x0025

Name：Set 32 subdivision, support division > 65535 .

Attri：ReadDWORD/WriteDWORD, Memory value.

BIT	Name	Type	Range	default	Description
0~31	32 bit subdivision	UINT32	200~1000000	default value	RW: driver subdivision, default 4000, unit: pulse/r

Example: Read the default value, 4000(0xFA0)

Request: 01 03 00 24 00 02 84 00

Response: 01 03 04 0F A0 00 00 F9 05

Set 10000 (0x2710)subdivision:

Request: 01 10 00 24 00 02 04 27 10 00 00 FB 35

Response: 01 10 00 24 00 02 01 C3

30. Motor Inductance

Add：0x0026

Name：Set the motor inductance

Attri：ReadWORD/WriteWORD, Memory value

BIT	Name	Type	range	default	Description
0~15	Motor inductance	UINT16	0~65535	momory value	RW the inductance, unit: 0.01mH

Note: The driver will automatically detect the motor inductance and internal resistance when powered on,
If you manually set and power off to save, the set value shall prevail. The next time it is powered on, it will not self check again.

Example: Read the motor inductance 3.7mH, value will be 370(0x172)

Request: 01 03 00 26 00 01 65 C1

Response: 01 03 02 01 72 39 F1

Set motor inductance 1.5mH, value will be 150(0x96)

Request/Response: 01 06 00 26 00 96 E8 6F

31. Motor Resistance

Add：0x0027

Name：Set Motor Resistance

Attri：ReadWORD/WriteWORD, Memory value

BIT	Name	Type	range	default	Description
0~15	Motor Resistance	UINT16	0~65535	memory value	RW: Motor reistance, Unit: 0.01Ω

Note: The driver will automatically detect the motor inductance and internal resistance when powered on,
If you manually set and power off to save, the set value shall prevail. The next time it is powered on, it will not self check again.

Example: Read the motor resistance: 0.6Ω, value 60(0x3C) *0.01=0.6Ω

Request： 01 03 00 27 00 01 34 01

Response: 01 03 02 00 3C B8 55

Set Motor resistance: 1Ω, means 100(x64)*0.01=1Ω

Request/Response： 01 06 00 27 00 64 38 2A

32. Maximum value of bus voltage

Add：0x0044

Name：Read the Maximum value of bus voltage

Attri：ReadWORD/WriteWORD

BIT	Name	Type	range	default	Description
0~15	Max. bus voltage	UINT16	0~65535	default value	Read the Max. value of the bus voltage, unit: 0.01V

Read the Max. value of the bus voltage 24.21V, means 2421 (0x975)

Request： 01 03 00 44 00 01 C4 1F

Response: 01 03 02 09 75 7F F3

Request/Response： 01 06 00 44 00 00 C9 DF

33. Maximum value of over-current

Add：0x0045

Name：read Maximum value of over-current

Attri：ReadWORD/WriteWORD

BIT	Name	type	range	default	Description
0~15	Max. over-current	UINT16	0~65535	default value	Read the Max. value of over-current, unit: 0.01A

Read the Max. value of over-current 4.16A, means 416(0x1A0):

Request： 01 03 00 45 00 01 95 DF

Response: 01 03 02 01 A0 B9 AC

The maximum value of the over-current can change at any time, and only the measured maximum value is displayed,
Can write 0 to clear the current maximum value and re-read the value:

Request/Response： 01 06 00 45 00 00 98 1F

34. Maximum number of lagging pulses

Add：0x0046

Name：Read the Maximum number of lagging pulses

Attri：ReadWORD/WriteWORD

BIT	Name	Type	range	default	Description
0~15	Max. lagging pulses	UINT16	0~65535	default value	Read Maximum number of lagging pulses, pulses

Read the Maximum number of lagging pulses, 199pulses, 199(0xC7):

Request: 01 03 00 46 00 01 65 DF

Response: 01 03 02 00 C7 F9 D6

The maximum numbe of lagging pulses can change at any time, and only the measured maximum value is displayed,
Can write 0 to clear the current maximum value and re-read the value:

Request/Response: 01 06 00 46 00 00 68 1F

35. Maximum number of leading pulses

Add：0x0047

Name：Read the Maximum number of leading pulses

Attri：ReadWORD/WriteWORD

BIT	name	type	range	default	Description
0~15	Max. leading pulses	UINT16	0~65535	default value	Maximum number of leading pulses, pulses

Example: Read Maximum number of leading pulses, 56 pulses:

Request: 01 03 00 47 00 01 34 1F

Response: 01 03 02 00 38 B9 96

The maximum number of leading pulses can change at any time, and only the measured maximum value is displayed,
Can write 0 to clear the current maximum value and re-read the value:

Request/Response: 01 06 00 47 00 00 39 DF

36. Minimum value of bus voltage

Add：0x0048

Name：Read the Minimum value of bus voltage

Attri：ReadWORD/WriteWORD

BIT	Name	Type	range	default	Description
0~15	Min.bus voltage	UINT16	0~65535	default value	Read the Minimum value of bus voltage, unit: 0.01V

Example: Read the Minimum value of bus voltage: 23.80V

Request: 01 03 00 48 00 01 04 1C

Response: 01 03 02 09 4C BF E1

The Minimum value of bus voltage can change at any time, and only the measured maximum value is displayed,
Can write 0 to clear the current maximum value and re-read the value:

Request/Response: 01 06 00 48 00 00 09 DC

37. Driver ID

Add：0x0066

Name：Read the driver ID, when it is 1, Actual ID= SW ID; Driver ID+ SW ID-1=Actual ID.

Attri：ReadWORD/WriteWORD, Memory value.

BIT	Name	Type	range	default	Description
0~15	Driver ID	UINT16	1~65535	default value	RW: The Driver ID, default is 1

Example: Read the driver default ID 1:

Request： 01 03 00 66 00 01 64 15

Response：01 03 02 00 01 79 84

Write the driver ID is 2:

Request/Response： 01 06 00 66 00 02 E8 14

38. Motor rotation direction

Add：0x006B

Name：RW: the Motor rotation direction

Attri：ReadWORD/WriteWORD, Memory value.

BIT	Name	type	range	default	Description
0~15	rotation direction	UINT16	0~1	default value	RW: THE Motor rotation direction, Default: 0(CW)

Example: Read the Motor rotation direction

Request： 01 03 00 6B 00 01 F5 D6

Response：01 03 02 00 00 B8 44

Write the motor rotation direction is 1(CCW):

Request/Response： 01 06 00 6B 00 01 39 D6

39. Reverse port level

Add：0x006C

Name：write Input port level signal

Attri：WriteWORD, no memory

BIT	name	type	range	description
15	Restore X7 input status	BIT	0~1	Restore X7 input status as factory setting
14	Restore X6 input status	BIT	0~1	
13	Restore X5 input status	BIT	0~1	
12	Restore X4 input status	BIT	0~1	
11	Restore X3 input status	BIT	0~1	
10	Restore X2 input status	BIT	0~1	
9	Restore X1 input status	BIT	0~1	
8	Restore X0 input status	BIT	0~1	
7	Reverse X7 input status	BIT	0~1	Rrverse X7 input status, Reverse as many times as you write 1
6	Reverse X6 input status	BIT	0~1	
5	Reverse X5 input status	BIT	0~1	
4	Reverse X4 input status	BIT	0~1	
3	Reverse X3 input status	BIT	0~1	
2	Reverse X2 input status	BIT	0~1	
1	Reverse X1 input status	BIT	0~1	
0	Reverse X0 input status	BIT	0~1	

Example: Reverse X2 input level status

Request/Response: 01 06 00 6C 00 04 48 14

0x04 = 0b0100, bit2=1, means X2 input level write 1 for reverse level status

40. Start Speed

Add：0x0096

Name：RW the motor's Start Speed (if traget speed < start speed, target speed will be Start speed)

Attri：ReadWORD/WriteWORD, Memory value

BIT	Name	Type	Range	default	Description
0~15	Start Speed	UINT16	0~300	default value	RW the motor's start speed, default 50, unit: RPM

Example: Read the motor'r start speed 50 RPM

Request： 01 03 00 96 00 01 64 26
Response： 01 03 02 00 32 39 91

Write the Motor's start speed is 0:

Request/Response: 01 06 00 96 00 00 69 E6

41. Stop Speed

Add：0x0097

Name：RW the motor's Stop Speed (if traget speed < start speed, target speed will be Stop speed)

Attri：ReadWORD/WriteWORD, Memory value

BIT	Name	Type	Range	default	Description
0~15	Stop Speed	UINT16	0~1000	default value	RW the motor's stop speed, default 50, unit: RPM

Example: Read the motor'r stop speed 50 RPM

Request： 01 03 00 97 00 01 35 E6
Response： 01 03 02 00 32 39 91

Write the Motor's stop speed is 0:

Request/Response: 01 06 00 97 00 00 38 26

42. Acceleration time

Add：0x0098

Name：RW the motors acceleration time (from start speed to target speed)

Attri：ReadWORD/WriteWORD, Memory value

BIT	Name	Type	Range	default	Description
0~15	acceleration time	UINT16	0~65535	default value	RW the motor's acceleration time, default 120, unit: ms

Example: Read the motor's acceleration 120 ms:

Request： 01 03 00 98 00 01 05 E5
Response： 01 03 02 00 78 B8 66

Write the motor's acceleration time 200 ms:

Request/Response： 01 06 00 98 00 C8 09 B3

43. Deceleration time

Add：0x0099

Name：RW the motor's Deceleration time (from traget speed to stop speed)

Attri：ReadWORD/WriteWORD, Memory value

BIT	Name	Type	Range	default	Description
0~15	deceleration time	UINT16	0~65535	default value	RW the motor's deceleration time default 120, unit: ms

Example: Read the motor'r deceleration time 120ms

Request: 01 03 00 99 00 01 54 25

Response: 01 03 02 00 78 B8 66

Write the Motor's deceleration time is 300 ms:

Request/Response: 01 06 00 99 01 2C 59 A8

44. Working Speed

Add：0x009A

Name：RW the motor's Working Speed (target speed)

Attri：ReadWORD/WriteWORD, Memory value

BIT	Name	Type	Range	default	Description
0~15	Start Speed	UINT16	0~1000	default value	RW the motor's working speed, default 300, unit: RPM

Example: Read the motor'r working speed(300RPM).

Request: 01 03 00 9A 00 01 A4 25

Response: 01 03 02 01 2C B8 09

Write the Motor's Working speed is 200 RPM:

Request/Response: 01 06 00 9A 00 C8 A8 73

45. Read and Write the software's Negative limt

Add：0x006E~0x006F

Name：RW the negative limit, After setting if the motor's current absolute position > set-position, it reverse operation reach this position and stop.

Attri：ReadDWORD/WriteDWORD,Memory value.

BIT	Name	type	Range	default	Description
0~31	RW negative limit	INT32	-2147483648~2147483647	-2147483648	RW the software's negative limit

Example: Read the software's negative limt:

Request: 01 03 00 6E 00 02 A5 D6

Response: 01 03 04 00 00 80 00 9B F3

Write the software's negative limt, -10000

Request: 01 10 00 6E 00 02 04 D8 F0 FF FF 4F 28

Response: 01 10 00 6E 00 02 20 15

46. Read and Write the software's positive limit

Add：0x0070~0x0071

Name：Read the positive limt, After setting if the motor's current absolute position > set-position, it reverse operation reach this position and stop.

Attri：ReadDWORD/WriteDWORD, Memory value.

BIT	Name	type	range	default	description
0~31	positive limit	INT32	-2147483648~2147483647	2147483647	RW the software's positive limt

Example: Read the software's positive limt:

Request： 01 03 00 70 00 02 C5 D0

Response：01 03 04 FF FF 7F FF 9A 67

Write the software's positive limt is 10000:

Request： 01 10 00 70 00 02 27 10 00 00 FF FA

Response：01 10 00 70 00 02 40 13

47. Limit Set /Cancel

Add：0x009B

Name：RW the motor's positive/negative limt.

Attri：ReadWORD/WriteWORD,Memory value.

BIT	Name	type	range	Description
15~13	Set Negative limit	BIT	0~1	000: Cancel, 001: Confirm
12	Negative limit Input	BIT	0~1	0: low level effectiv(PNP), 1 : high level effective(NPN)
11~8	Negative limit port	BIT	0~15	Port X0~X15 corresponding 0~15
7~5	Set positive limit	BIT	0~1	000: Cancel, 001: Confirm
4	positive limit Input	BIT	0~1	0: low level effective (PNP), 1: high level effective(NPN)
3~0	positive limit port	BIT	0~15	Port X0~X15 corresponding 0~15

Note: After setting the limit, all motion commands are carried out within the limit, Stop immediately when encountering limit movement, When limiting, only respond to motion commands that are opposite to the limit .
After setting the hardware limit, the software limit becomes invalid

Read the motor's Positive/Negative limit:

Request： 01 03 00 9B 00 01 F5 E5

Response：01 03 02 00 00 B8 44

Assuming the sensor is an NPN type, set X0 as the negative limit, X1 is the positive limit input port.
According to the instructions, the result is 001 1 0000 001 1 0001.
(bit3~0: 0001, bit4: 1, bit7~5: 001, bit11~8: 0000, bit12: 1, bit15~13: 001)
If converted to hexadecimal, the register value is 0x3031:

Request/Response： 01 06 00 9B 30 31 2D F1

48. Home settings:

Register Address	definintion	BIT	name	type	range	description
0x009C ReadWORD/WriteWORD Memory value	Enable Input port	15~13	Set Enable Sginal	BIT	0~1	000: cancel, 001: confirm
		12	Enable Signal input	BIT	0~1	0: low level effective(PNP),1: high level effective(NPN)
		11~8	Enable Input port	BIT	0~15	Port X0~X15 corresponding 0~15
	Home Input port	7~5	Set Home Signal	BIT	0~1	000: cancel, 001: confirm
		4	Home signal input	BIT	0~1	0: low level effective(PNP),1: high level effective(NPN)
		3~0	Home Signal input port	BIT	0~15	Port X0~X15 corresponding 0~15
0x009D ReadWORD/WriteWORD Memory value	Secondary Home	15	Secondary home direction	BIT	0~1	0: CW, 1: CCW(Limit priority)
		14~0	Number of pulses from Home	BIT	0~32767	Home completed,Set the number of pulses for forward or reverse, Reverse or forward return to Home again
0x00AE ReadWORD/WriteWORD Memory value	Home completed Output Signal	15~8	Home completed Output status	BIT	0~1	0: Open(Output after completed) 1: Closed(no Output)
		7~0	Output port	BIT	0~8	Output portY0~Y7 corresponding 1~8, 0: cancel output after home completed
0x00C9 WriteWORD Memory value	Start Home Command	15	Homing direction	BIT	0~1	0: forward, 1: reverse
		14~6	Homing speed	BIT	0~511	Homing speed, eg 50 means 0011 0010
		5	Home stop method	BIT	0~1	0:Slow down to stop,1:Stop immediately
		4~0	Secondary home speed	BIT	0~31	Secondary home speed, value*5=actual speed, 0: no secondary home, Max. 31*5=155RPM

Note: After setting the limit, all motion commands are carried out within the limit, Stop immediately when encountering limit movement, When limiting, only respond to motion commands that are opposite to the limit.

step1: Set Home port(Mandatory)
NPN sensor, Set X2 as the home input port, according to the instructions, the result is 0000 0000 0011 0010(0x003232)

Request/Response: 01 06 00 9C 00 32 C8 31

Request: 01 03 00 9C 00 01 44 24
Response: 01 03 02 00 32 39 91

step2: Secondrary home Distance and Direction(Optional)
1st home completed, forward 500 pulses then home, according to the instructions, result is: 0 000 0001 1111 0100(0x01F4)

Request/Response: 01 06 00 9D 01 F4 18 33

Request: 01 03 00 9D 00 01 15 E4
Response: 01 03 02 01 F4 B8 53

step3: Home completed Output Signal(optional)
Home completed, set Y1 is home output port (default Y1 in-place output), after home completed output signal to PLC, value: 0x0002

Request/Response: 01 06 00 AE 00 02 69 EA

Request: 01 03 00 AE 00 01 E5 EB
Response: 01 03 02 00 02 39 85

step4, set home method(direction,speed, stop method, secondary-home speed)
Assuming a reverse return to home at 200RPM, it will immediately stop when it hits home,The Secondaary home speed is 10 (value) * 5=50RPM
According to the instructions, the binary value is 1 011001000 1 01010(0xB22A)

Request/Response: 01 06 00 C9 B2 2A AC 8B

49.Constant torque Setting(Closed loop only)

register address	definition	BIT	name	type	range	description
0x009E ReadWORD/WriteWORD memory value	torque mode	15~8	After collision,Homing	BIT	1	1: Homing after collision
			Rotation	BIT	2	2: Forward roation with torque,Reverse no torque or Reverse roatoin with torque, forward no torque.
			constant torque	BIT	3	3: constant torque
	Torque level	7~0	Torque level	BIT	0~1	256 level torque,0 ~255 . The value should not be set too small, otherwise it may cause the motor cannot reach the target speed
0x00CB WriteWORD memory value	Execute torque mode	15	Rotation direction	BIT	0~1	0: Forward, 1: Reverse
		14~1	Offset pulses	BIT	0~15	When colliding back to home, Offset-pulses after the collision as home
		0	Stop/Run	BIT	0~1	0: Stop, 1: Run

Step1, Set constant torque mode and torque value
Collision return to Home, if torque level 50(according to the insturctions, value is 0x0132)

Request/Response: 01 06 00 9E 01 32 68 61

Request: 01 03 00 9E 00 01 E5 E4
Response: 01 03 02 01 32 38 01

Step2, Start constant torque mode(including direction, run/stop,offset pulses)

Assuming a forward collision with a physical limit and an offset of 500 pulses as the Home,
According to the instructions, the binary value obtained is: 0 00000 11111010 01, means (0x03E9)

Request/Response: 01 06 00 CB 03 E9 39 4A

Note: The speed of grasping objects and colliding back to hoome is the system speed. When running with constant torque, the speed changes based on the resistance. When the resistance exceeds the set value, the motor stops, and the resistance decreases to the set torque to continue running.
The torque level is set based on resistance. If the resistance is high, the value increases accordingly.
Otherwise, the motor may not have touched the physical limit or stopped when grabbing an object.

50. Set Working mode

Add：0x009F
Name：Set working mode
Attri：ReadWORD/ WriteWORD, Memory value

BIT	Name	Type	range	default	Description
0~15	Set working mode	UINT16	1~3	Memory value	RW: Working mode, default 3 (I/O control mode)

1：Twin-pulse mode 2：Pulse & Direction Mode 3：I/O control mode
Twin pulse mode: X0(CW) and X1(CCW) are pulse port; Pulse & Direction mode: X0 is Pulse port, X1 is direction port.

Example: Read the default working mode: 3 (IO control mode)

Request: 01 03 00 9F 00 01 B4 24
Response: 01 03 02 01 00 03 F8 45

Set working mode to 2, Pulse & direction mode:

Request/Response: 01 06 00 9F 00 02 38 25

51. Output setting

Register Address	definition	BIT	Name	type	range	Description
0x00A0 WriteWORD	open output port	15~8	reserve	BIT	0	reserve
		7	Y7	BIT	0~1	1: open output port Y7 (connected)
		6	Y6	BIT	0~1	1: open output port Y6 (connected)
		5	Y5	BIT	0~1	1: open output port Y5 (connected)
		4	Y4	BIT	0~1	1: open output port Y4 (connected)
		3	Y3	BIT	0~1	1: open output port Y3 (connected)
		2	Y2	BIT	0~1	1: open output port Y2 (connected)
		1	Y1	BIT	0~1	1: open output port Y1 (connected)
		0	Y0	BIT	0~1	1: open output port Y0 (connected)
0x00A1 WriteWORD	close output port	15~8	reserve	BIT	0	reserve
		7	Y7	BIT	0~1	1: close output port Y7 (disconnected)
		6	Y6	BIT	0~1	1: close output port Y6 (disconnected)
		5	Y5	BIT	0~1	1: close output port Y5 (disconnected)
		4	Y4	BIT	0~1	1: close output port Y4 (disconnected)
		3	Y3	BIT	0~1	1: close output port Y3 (disconnected)
		2	Y2	BIT	0~1	1: close output port Y2 (disconnected)
		1	Y1	BIT	0~1	1: close output port Y1 (disconnected)
		0	Y0	BIT	0~1	1: close output port Y0 (disconnected)
0x00A2 ReadWORD	read output port	15~8	reserve	BIT	0	reserve
		7	Y7	BIT	0~1	1: Open output port Y7; 0: close output port Y7
		6	Y6	BIT	0~1	1: Open output port Y6; 0: close output port Y6
		5	Y5	BIT	0~1	1: Open output port Y5; 0: close output port Y5
		4	Y4	BIT	0~1	1: Open output port Y4; 0: close output port Y4
		3	Y3	BIT	0~1	1: Open output port Y3; 0: close output port Y3
		2	Y2	BIT	0~1	1: Open output port Y2; 0: close output port Y2
		1	Y1	BIT	0~1	1: Open output port Y1; 0: close output port Y1
		0	Y0	BIT	0~1	1: Open output port Y0; 0: close output port Y0
0x00A5 WriteWORD memory value	confirm/cancel alarm output port	15~8	alarm output status	BIT	0~1	alarm output status, 0: close(alarm output); 1: open(no alarm output)
		7~0	alarm output port	BIT	0~8	Port Y0~Y7 corresponding 1~8, 0: Cancel alarm output
0x00A6 WriteWORD memory value	confirm/cancel output port status when running	15~8	output status when running	BIT	0~1	0: Close(Output when ruuning); 1: Open(no output when running)
		7~0	Output port	BIT	0~8	Port Y0~Y7 corresponding 1~8, 0: Cancel alarm output
0x00A7 WriteWORD memory value	confirm/cancel output port status when in-place	15~8	output status when in-place	BIT	0~1	0: Close(Output when in-place); 1: Open(no output when in-place)
		7~0	Output port	BIT	0~8	Port Y0~Y7 corresponding 1~8, 0: Cancel alarm output

Note: Open loop: default: Y0: alarm output(connected) ; Y1: running output(connected)
Closed loop: default: Y0: alarm output(connected) ; Y1: in-place output(connected)
if you want to re-define the Y0Y1 output function, just Cancel the default function firstly.

Example 1: Open output port Y0,Y1,Y6, then close all output port

Step1, Cancel output port Y0 Y1 default function: Cancel alarm,running or in-place output.

Request/Response: 01 06 00 A5 00 00 99 E9
Request/Response: 01 06 00 A6 00 00 69 E9
Request/Response: 01 06 00 A7 00 00 38 29

Step2, Open output port Y0,Y1,Y6, value is 1000011 (0x0043)

Request/Response: 01 06 00 A0 00 43 C8 19

Step3, Close all input port, value is 11111111(0x00FF)

Request/Response: 01 06 00 A1 00 FF 98 68

Read the ouput status:

Request: 01 03 00 A2 00 01 25 E8
Response: 01 03 02 00 00 03 B8 44

Example2: Set Output Y0 running status, always no output when running, Output when stop.
Set Output Y1 alarm status, always no alarm output, output when driver back to normal.

Step1, Cancel output port Y0 Y1 default function: Cancel alarm,running or in-place output.

Request/Response: 01 06 00 A5 00 00 99 E9
Request/Response: 01 06 00 A6 00 00 69 E9
Request/Response: 01 06 00 A7 00 00 38 29

Step2, Set Output port Y0,Y1 Function, set Y0 as Ouput, always no output when running,
According instructions, bit0=1, bit8=1, 1 0000 0001(0x0101)

Request/Response: 01 06 00 A6 01 01 C8 19

52. Alarm prameters

Register address	definition	BIT	Name	type	range	description
0x00A3 ReadWORD	Alarm information	15~13	the third time alarm information	BIT	0	Normal
				BIT	1	Over-current
				BIT	2	Over-voltage
		11~8	the second time alarm information	BIT	3	Under-voltage
				BIT	4	Phase A open circuit
				BIT	5	Phase B open circuit
		7~4	the first time alarm information	BIT	6	offset pulses or others
				BIT	7	internal 24V offset
				BIT	8	AI voltage error
	alarm status	3~0	current alarm information	BIT	9	BI voltage error
				BIT	10	Encoder error
0x00A4 WriteWORD	clear alarm status	0~15	clear alarm status	BIT	0	write 0 to clear alarm status

Example: Read the alarm status

Request: 01 03 00 A3 00 01 74 28
Response: 01 03 02 00 03 F8 45

Clear the alarm status

Request/Response: 01 06 00 A4 00 00 04 29

53. Position reminder register

register address	Attri	BIT	Name	type	range	default	Identification bit	description
0x00A8~0x00A9	ReadDWORD WriteDWORD memory value	0~31	position reminder	INT32	-2147483648 to 2147483647	memory value	X11	bit31=0, ⩾ the set value reminder. bit31=1, < set value reminder. last 31bit is sign number of 31 bits.
0x00C2~0x00C3							X17	
0x00C4~0x00C5							X18	
0x00C6~0x00C7							X19	

Example: X11 Current position > -500 Reminder

Request: 01 10 00 A8 00 02 04 FE 0C 7F FF 69 EA
Response: 01 10 00 A8 00 02 C0 28

Example: X17 Current position < 5000 Reminder

Request: 01 10 00 C2 00 02 04 13 88 80 00 9B 48
Response: 01 10 00 C2 00 02 E0 34

54. Setting, Calling, Executing Table data

Register Address	definition	BIT	name	type	range	description
0x00AA WriteWORD memory value	Table size	0~15	number of the saved data	BIT	1~2048	RW: the number of the saved data
0x00AB WriteWORD memory value	Table pointer	0~15	Start position of the table	BIT	0~4095	RW:Point to the data location where the table is stored. The first data position pointer is 0, one data occupies two register
0x00AC WriteWORD memory value	Tabel start adress	0~15	Start position of the saved data	BIT	300~2048	RW: the position of the saved data
0x00DD WriteWORD	Execute Table data	15	Absolute/Relavtie	BIT	0~1	0: Absolute position, 1: Relative position
		14~12	Pointer algorithm	BIT	0~1	0: Addtion, 1: Subtraction
		11~0	Pointer change constant	BIT	0~4095	The current table pointer value is added to this constant as the next data position to be executed

Example:

Step1, confirm the table data:

SN	Add	data	SN	Add	data	SN	Add	data	SN	Add	data
0	500~501	25535	6	512~513	12345	12	524~525	1345	18	536~537	2345
1	502~503	-13575	7	514~515	-600	13	526~527	-6000	19	538~539	-5600
2	504~505	12352	8	516~517	5635	14	528~529	56315	20	540~541	8635
3	506~507	-11231	9	518~519	-3565	15	530~531	-35615	21	542~543	-1365
4	508~509	24563	10	520~521	25635	16	532~533	2565	22	544~545	15635
5	510~511	-18963	11	522~523	-25635	17	534~535	-2535	23	546~547	-5635

As shown in the above table, assuming there are a total of 24 positions that need to be executed, if execute them through regular instructions, the program will be more complex and prone to errors...
But if we establish a table in advance and call the table data at runtime, it is very fllexible and less prone to errors.

Note: The storage address for table data must be greater than or equal to 300, which means it needs to be stored in the programming area. If there are other commands in the programming area, the data cannot overlap. For example, if the programming area itself has instructions that occupy addresses 300-400, we can set the starting address of the table to 500.

Step2, Send the table to the required position:

Send item by item, such as: 500~501: 01 10 01 F4 00 02 04 63 BF 00 00 DF 28 (25535)
502~503: 01 10 01 F6 00 02 04 CA F9 FF FF 9F 08 (-13575)
.....

It can also be sent at once, but please note that the entire instruction should not exceed 200 bytes, as follows:

01 10 01 F4 00 30 60 63 BF 00 00 CA F9 FF FF 30 40 00 00 D4 21 FF FF 5F F3 00 00 B5 ED FF FF 30 39 00 00 FD A8 FF FF 16 03 00 00 F2 13 FF FF 64 23 00 00 9B DD FF FF 05 41 00 00 E8 90 FF FF DB FB 00 00 74 E1 FF FF 0A 05 00 00 F6 19 FF FF 09 29 00 00 EA 20 FF FF 21 BB 00 00 FA AB FF FF 3D 13 00 00 E9 FD FF FF 14 91

After sending, it is necessary to send a save command to save the data
The red symbol represents the data format, the green one represents the checksum, and the black one in the middle represents the data.
One data occupies two registers, which means four bytes are one data.

Step3, Set the number of the table data

if 24 positions, table size wil be 24(0x0018):

01 06 00 AA 00 18 A9 E0

Step4, Set the table pointer, position start at 0:

If execution needs to start from position 21 (-1365) in the table, pointer is 21, send the following command:

01 06 00 AB 00 15 39 E5

Step5, Set start position of the table.

The starting address of the table refers to the location stored in the programming area, the actual address - starting addreess(programming area)
Assuming the storage address of the first set of data in the table is 500-501, the starting address of the table is 500-300=200.

01 06 00 AC 00 C8 48 7D

Step6, Eexcute Tale data

Assuming the data in the table is an absolute position, subtract 1 from the pointer of the previous data table after each execution (If starting from sequence number 22 and executing again, it will change to executing data with sequence number 21).
The table pointer constant is 1, command as follows:

01 06 00 DD 10 01 D5 F0

55. Set emergency-stop to specified input port

Register address	Name	BIT	definition	type	range	description
0x00AD WriteWORD /ReadWORD memory value	reserve	15	reserve	BIT	0~1	reserve, constant value:0
	set emergency-stop Output	14	Output/no-Output	BIT	0~1	0: disconected, e-stop output, 1: connected, no output
	set e-stop Output port	13~10	set e-stop to Output port	BIT	0~8	Output portY0~Y7 corresponding 1~8, 0: cancel e-stop output
	1st group e-stop input effective level	9	e-stop input when Effective level	BIT	0~1	0: e-stop input if low level; 1: e-stop input if high level
	1st group e-stop input port	8~5	set e-stp to input port	BIT	0~8	Input portX0~X7 corresponding 1~8, 0: cancel e-stop Input
	2nd group e-stop input effective level	4	e-stop input when Effective level	BIT	0~1	0: e-stop input if low level; 1: e-stop input if high level
	2nd group e-stop input port	3~0	set e-stp to input port	BIT	0~8	Input portX0~X7 corresponding1~8, 0: cancel e-stop Input

Example: Set Input port X3 e-stop when low level effective; input port X4 e-stop when high level; open output port Y2 when e-stop:
acrroding insturction the value is: 0 1 0011(Y2) 0 0100(X3) 1 0101(X4), 100110010010101 means (0x4C95)

Request/Response: 01 06 00 AD 4C 95 EC 84

Request: 01 03 00 AD 00 01 15 EB
Response: 01 03 02 4C 95 4C EB

56. Set Speed-switching to specified input port

register adress	name	BIT	definition	type	range	description
① 0x00AF ② 0x00B0 ③ 0x00B1 ④ 0x00B2 WriteWORD /ReadWORD Memory value	set input port	15~12	input port	BIT	0~15	input portX0~X14 corresponding 1~15, 0: cancel input function
	set trgiger effetive method	11	effective method	BIT	0~1	0 : Level trigger: 1: Edge trigger
	set effective input signal	10	effective signal	BIT	0~1	0: low level/falling edge trigger speed; 1: high level/rising edge trigger speed
	set effective direction	9~8	effective direction	BIT	0~2	0: both direction, 1: forward 2: reverse
	new speed after input-changed	7~0	new speed	BIT	0~255	if value: 5, means 5 times the setted speed, if setted speed 100RPM, actual=500RPM
0x00B3	0x00AF high bit of port no.	15	0x00AF port no.	BIT	0~1	add upper 4 bit of 0x00AF as port no. 32bit
	replace 0x00AF 7~0bit speed	14~0	0x00AF speed	BIT	0~5000	RW: 0x00AF speed, unit: RPM
0x00B4	0x00B0 high bit of port no.	15	0x00B0 port no.	BIT	0~1	add upper 4bit of 0x00B0 as port no. 32bit
	replace 0x00B0 7~0bit speed	14~0	0x00B0 speed	BIT	0~5000	RW: 0x00B0 Speed, unit: RPM
0x00B5	0x00B1 high bit of port no.	15	0x00B1 port no.	BIT	0~1	Add upper 4bit of 0x00B1 as port no. 32bit
	replace 0x00B1 7~0bit speed	14~0	0x00B1 speed	BIT	0~5000	RW: 0x00B1 speed, unit: RPM
0x00B8	0x00B2 high bit of port no.	15	0x00B2 port no.	BIT	0~1	Add upper 4bit of 0x00B2 as port no. 32bit
	replace 0x00B2 7~0bit speed	14~0	0x00B2 speed	BIT	0~5000	RW: 0x00B2 speed, unit: RPM

From 0x00AF to 0x00B2, all four registers can be set with fast conversion speed through the input port, Four ports can be set simultaneously, but during execution, pay attention to prioritizing low addresses. Namely: When low bit address is executed, high bit address can't execute.

From 0x00AF to 0x00B2, these four registers have limitations due to the speed set by the lower 7 bits, The port numbers set in the upper 4 bits are only 16, which cannot meet the number of status registers corresponding to register 0x0006, So, in addition, set the highest bit of the four registers from 0x00B3 to 0x00B5 and 0x00B8 as the highest bit of the port number for expanding the port number, The lower 14 bits are used to expand the speed range after transformation.

Example: set X0 input, both direction, speed: 50rpm(10rpm before change), value is 1 0 1 00 0000 1010 (0x140A)

Request/Response: 01 06 00 AF 14 0A 36 EC

Assuming that the bidirectional speed needs to be changed to 47RPM, which cannot be achieved solely through the 0x00AF instruction, we can modify its corresponding speed register 0x00B3

Request/Response: 01 06 00 B3 00 2F 39 F1

Example 2: set X17 at rising edge, reverse direction, speed 1000RPM, 0010 1110 0000 1010, (0x2E 0A)
X17>15，1000>255, need to borrow the B4 register, highest bit: 1, low 14bit: 1000, (0x83E8)

Request/Response: 01 06 00 B0 2E 0A 15 8A
Request/Response: 01 06 00 B4 83 E8 A8 92

Priority: AF>B0>B1>B2 High address speed can be directly switched to the speed set for low address, but low address speed cannot be directly switched to high address speed. The system speed needs to be restored first before switching to high address speed.

57. Set dynamic positioning

regsiter address	name	BIT	definition	type	range	description
0x00B6~0x00B7 WriteWORD /ReadWORD memory value	port no.	31~28	Set input port no.	BIT	0~8	input X0~X14 corresponding 1~15, 0: cancel input function
	trigger method	27	set trigger method	BIT	0~1	0: Level effective, 1: Edge effective
	input signal	26	set effective input signal	BIT	0~1	0: low level/falling edge trigger speed; 1: high level/rising edge trigger speed
	direction	25~24	set efective direction	BIT	0~2	0: both direction, 1: forward 2: reverse
	pulses	23~0	set the input pulses after changed,	BIT	0~16777215	the pulses after the input-changed

This command must be set to take effect during runtime. When the motor is stationary, triggering the setting port, the motor will not run.

Example: set forward running, X0 input, runs 200 pulses then stop, reverse not effective
Value will be: 1 0 1 01 0000 0000 0000 0000 1100 1000 , 0x1500 00C8

Request: 01 10 00 B6 00 02 04 00 C8 15 00 F7 9F
Response: 01 10 00 B6 00 02 A0 2E

Request: 01 03 00 B6 00 02 25 ED
Response: 01 03 00 B6 04 00 C8 15 00 75 5D

58. Set I/O function to trigger motion(velocity mode)

register address	Name	BIT	definition	type	range	description
0x00BA~0x00BB WriteWORD /ReadWORD Memory value	input port	31~28	group4 trigger port	BIT	0~15	port X0~X7 corresponding to 1~8, 0: Cancel this function
	effective level	27	group4 trigger level	BIT	0~1	0: low level runs; 1: high level runs
	runs direction	26	group4 runs direction	BIT	0~1	0 : CW; 1: CCW
	reserve	25~24	reserve	BIT	0	reserve
	input port	23~20	group3 trigger port	BIT	0~15	port X0~X7 corresponding to 1~8, 0: Cancel this function
	effective level	19	group3 trigger level	BIT	0~1	0: low level runs; 1: high level runs
	runs direction	18	group3 runs direction	BIT	0~1	0 : CW; 1: CCW
	reserve	17~16	reserve	BIT	0	reserve
	input port	15~12	group2 trigger port	BIT	0~15	port X0~X7 corresponding to 1~8, 0: Cancel this function
	effective level	11	group2 trigger level	BIT	0~1	0: low level runs; 1: high level runs
	runs direction	10	group2 runs direction	BIT	0~1	0 : CW; 1: CCW
	reserve	9~8	reserve	BIT	0	reserve
	input port	7~4	group1 trigger port	BIT	0~15	port X0~X7 corresponding to 1~8, 0: Cancel this function
	effective level	3	group 1 trigger level	BIT	0~1	0: low level runs; 1: high level runs
	runs direction	2	group1 runs direction	BIT	0~1	0 : CW; 1: CCW
	reserve	1~0	reserve	BIT	0	reserve

Set X0 high level CW direction, X1 high level CCW direction, value: 10110000011000 (0x0000 2C18)

Request: 01 10 00 BA 00 02 04 2C 18 00 00 F0 33
Response: 01 10 00 BA 00 02 60 2D

Request: 01 03 00 BA 00 02 E5 EE
Response: 01 03 04 2C 18 00 00 72 A4

59. Rotor Synchronous deviation value(closed loop)

Add: 0x00BE

Name: Set the rotor synchornous deviation, use for adjust home-deviation value.

Attri: ReadWORD/WriteWORD, Memory value

BIT	Name	type	range	default	Description
0~15	Rotor sync. deviatoin	INT16	-80~80	memory value	RW: Rotor sync. deviation value, defaul 0, unit pulses

The driver will automatically set a motor origin when powered on, in order to unleash the maximum torque of the motor, However, in certain external force situations, the optimal value cannot be achieved, and it is necessary to adjust the origin position through the rotor synchronization deviation value to achieve the best effect.

Example: Read the rotor synchronization devaiation value, 0:

Request: 01 03 00 BE 00 01 E4 2E
Response: 01 03 02 00 00 B8 44

Set the rotor synchronization devaiation value is -5 , 0xFFFB

Request/Response: 01 06 00 BE FF FB E9 D9

60. Position loop proportion (closed loop)

Add: 0x00BF

Name: set position loop proportion coefficient

Attri: ReadWORD/WriteWORD, Memory value

BIT	Name	type	range	default	description
0~15		UINT16	0~65535	memory value	RW: position loop proportion coefficient, it /100= actual value

The larger the setting value, the greater the stiffness, It can shorten the positioning time, and under the same frequency pulse condition, the position lag is smaller. But too large a value may cause oscillation or overshoot.
The parameter values are determined based on specific load conditions

Example: Read position loop proportion coefficient value 100(0x0064), actual value is 1.

Request: 01 03 00 BF 00 01 B5 EE
Response: 01 03 02 00 64 B9 AF

Set position loop proportion coefficient value 1000(0x03e8), actual value is 10.

Request/Response: 01 06 00 BF 03 E8 B8 90

61. Position loop integral(closed loop)

Add：0x0029

Name：Set Position loop integral time-constant

Attri：ReadWORD/WriteWORD, Memory value

BIT	Name	type	range	default	description
0~15	position loop integral	UINT16	0~65535	memory value	RW: Set position loop integral time-constant, it/10000=actual

The smaller the setting value, the faster the integration speed, and the stronger the system's resistance to deviation, that is, the greater the stiffness, But being too small can easily cause overshoot

Example: Read the position loop integral time-constant 100, actual value 0.001

Request: 01 03 00 29 00 01 55 C2

Response: 01 03 02 00 64 B9 AF

Set Position loop integral time-constant 10, actual value 0.0001

Request/Response: 01 06 00 29 00 0A D8 05

62. Speed loop proportion coefficient(closed loop)

Add：0x00C0

Name：set speed loop proportion coefficient

Attri：ReadWORD/WriteWORD,Memory value.

BIT	Name	Type	range	default	Description
0~15	speed loop proportion	UINT16	0~65535	memory value	RW: speed loop proportion coefficient, it /100= actual value

The larger the setting value, the greater the stiffness. The parameter values are determined based on the specific load situation. In general, the larger the load inertia, the larger the set value. Under the condition that the system does not generate oscillations, a larger value can be set. This value needs to be greater than the proportional coefficient of the position loop, otherwise the system will be unstable.
When increasing the proportion coefficient of the position loop, it is necessary to increase the proportion coefficient of the speed loop.

Example: Read the speed loop proportion coefficient 100, actual value is 1

Request: 01 03 00 C0 00 01 84 36

Response: 01 03 02 00 64 B9 AF

Set speed loop proportion coefficient 500(0x01f4), actual is 5

Request/Response: 01 06 00 C0 01 F4 89 E1

63. Speed loop integral time-constant(closed loop)

Add：0x00C1

Name：set speed loop inegral time-constant(closed loop)

Attri：ReadWORD/WriteWORD, Memory value.

BIT	Name	type	range	default	description
0~15	speed loop integral	UINT16	0~65535	memoruy value	RW: Set position loop integral time-constant, it/100=actual value

The smaller the setting value, the faster the integration speed, and the stronger the system's resistance to deviation, that is, the greater the stiffness, But being too small can easily cause overshoot

Example: Read the speed loop inegral time-constant 1000, actual value is 10

Request: 01 03 00 C1 00 01 D5 F6

Response: 01 03 02 03 E8 B8 FA

Set the speed loop inegral time-constant 100, actual value is 1

Request/Response: 01 06 00 C1 00 64 D9 DD

63. Read the motor's working speed

Add：0x00D6~0x00D7

Name：Read the speed(pulse speed if open loop; rotor speed if closed loop)

Attr：ReadDWORD

BIT	Name	type	range	default	description
0~31	real-time speed	INT32	-2147483648~2147483647	defualt value	R: real-time speed, positive number: forward; negative number: reverse unit: RPM

Example: Rad the current speed

Rquest: 01 03 00 D6 00 02 25 F3

Response: 01 03 04 00 00 00 00 FA 33

64. Set the target Speed

Add：0x00D8~0x00D9

Name：RW the target speed

Attri：ReadDWORD/WriteDWORD,Memory value

BIT	Name	type	range	default	Description
0~31	target speed	INT32	-999999~999999	defualt vlaue	RW: Motor Speed, default: 30000, Unitp: 0.01RPM

Example： Read the default speed 30000, actual 300RPM

Request: 01 03 00 D8 00 02 44 30

Response: 01 03 04 75 30 00 00 E0 30

Set the target speed 50000, actual 500RPM

Request: 01 10 00 D8 00 02 04 C3 50 00 00 C3 00

Response: 01 10 00 D8 00 02 C1 F3

65. Motion command

All running instructions can be executed separately

① start/stop(no target position)

Add：0x00C8

Nmae：Start or stop working as velocity mode, speed value is from 0x009A setted

Attri：WriteWORD

BIT	Name	type	range	description
0~15	Start /Stop	UINT16	0．1.256.257	0:Deceleration Stop; 1:Forward running; 256: Emergency stop; 257: Reverse runing

Example: Set the motor Reverse running:

Request/Response: 01 06 00 C8 01 01 C8 64

② JOG(no target position)

Add：0x00CA

Name：Set the motor's start/stop/speed/directoin

Attri：WriteWORD

BIT	Name	type	range	description
15	Direction	BIT	0~1	0: CW; 1: CCW
14~6	Speed	BIT	0~511	Speed，eg: 50, value will be 0 0011 0010
5	Stope method	BIT	0~1	0: Deceleration stop; 1: Emergency stop
4~1	reserved	BIT	0	reserved
0	Start/Stop	BIT	0~1	0: Stop; 1:Start

Example: Speed 50RPM, CW direction, Start, value will be 0000 1100 1000 0001 (0x0C81)

Request/Response: 01 06 00 CA 0C 81 6C 94

③ running time(no target position)

Add：0x00CC~0x00CD

Name：Set the motor running time, speed value is from 0x009A setted

Attri：WriteDWORD

BIT	Name	Type	Range	Description
0~31	Running time	INT32	-2147483648~2147483647	RW: Motor running time, unit: ms

Example: Set Motor reverse running 6400ms, value will be -6400:

Request: 01 10 00 CC 00 02 04 E7 00 FF FF C8 AE
Response: 01 10 00 CC 00 02 81 F7

④ Set number of the pulses(relative to current position in stop state)

Add：0x00CE~0x00CF

Name：Set the number of pulses(Relative to the current position, before completed not run next command)

Attri：WriteDWORD

BIT	Name	type	range	description
0~31	Set number of pulses	INT32	-2147483648~2147483647	RW: the number of pulses, positive integer: foward direction. negative means reverse

Example: Set Motor rverse runs 10000 pulses, value will be: -10000

Request: 01 10 00 CE 00 02 04 D8 F0 FF FF 45 50
Response: 01 10 00 CE 00 02 20 37

⑤ Set number of pulses(relavtive to current position)

Add：0x00DE~0x00DF

Name：Set number of pulses(relative to current position, cancel current command if get new command,and runs next command instantly.)

Attri：WriteDWORD

BIT	Name	Type	range	description
0~31	number of pulses	INT32	-2147483648~2147483647	RW: the number of pulses, positive integer: foward direction. negative means reverse

Example：Set motor forward runs 5000 pulses, value will be 5000

Request: 01 10 00 DE 00 02 04 13 88 00 00 FB D1
Response: 01 10 00 DE 00 02 21 F2

⑥ Run to a absolute position(Only execute in stationary state)

Add：0x00D0~0x00D1

Name：run to a absolute position(relative to home)

Attri：WriteDWORD

BIT	Name	Type	range	Description
0~31	Runs to absolute position	INT32	-2147483648~2147483647	Set a absolute position: pulses, if < current position, negative direction; if > curren position,positive direction; if= current position, Stop/not runs

Example: Runs to absolute position 10000 pulses:

Request: 01 10 00 D0 00 02 04 27 10 00 00 F5 82
Response: 01 10 00 D0 00 02 40 31

⑦ Run to a absolute position

Add：0x00E8~0x00E9

Name：Run to a absolute position(relative to Home, cancel current command if get new command,and runs next command instantly)

Attri：WriteDWORD

BIT	Name	type	range	description
0~31	run to a absolute position	INT32	-2147483648~2147483647	Set a absolute position: pulses, if < current position, negative direction; if > curren position,positive direction; if= current position, Stop/not runs

Example: Runs to absolute position -8000 pulses.

Request: 01 10 00 E8 00 02 04 E0 C0 FF FF CA 0D
Response: 01 10 00 E8 00 02 C1 FC

66. Set the absolute position

Add：0x00D2~0x00D3

Name：Set the absolute position

Attri：WriteDWORD

BIT	Name	type	range	description
0~31	set absolute position	INT32	-2147483648~2147483647	Set the absolute position from Home(setted 0 position)

Example: set the motor's current absolute position is 1000:

Request: 01 10 00 D2 00 02 04 03 E8 00 00 FF 5A
Response: 01 10 00 D2 00 02 E1 F1

67. Off/Enable/Reset

Add：0x00D4

Name：Set driver Enable/Off

Attri：WriteWORD

BIT	Name	type	value	description
15~8	restart	BIT	0~1	write 1 to restart the driver
7~0	off/enable	BIT	0~1	Write: 0: Enable the motor; 1: Release the motor

Example：restart the driver, value is 1 0000 0000 (0x0100)

Request: 01 06 00 D4 01 00 C8 62

No response data when restart the driver.

68. Execute programming command

Add：0x00DB

Name：start/stop progrramming command

Attri：WriteWORD

BIT	Name	type	range	description
0~15	programming	UINT16	0~1	Write: 1: start programming command; 0: Stop programming

Example: Execute programming command

Request/Response: 01 06 00 DB 00 01 38 31

69. Save parameters

Add：0x00DC

Name：save programming command or parameters

Attri：WriteWORD, Memory value

BIT	Name	type	range	description
0~15	Save command	UINT16	0~1	Write: 1: save command; 0: Restore factory setting

1. Clean lifespan limit with a maximum of 100000 erasures. 0.1 seconds/cleaning, all output will be turned off during the cleaning.
2. If used to save programming, the original address containing data will automatically overwrite the original programming command.
3. For powered off for saving, users can set the parameters and send the command to save when power on.

Example: Save parameters:

Request/Response: 01 06 00 DC 00 01 89 F0