Bus-Type Step Drive
MC556-RS485

User's Manual

Contents

I. Product Introduction

MC556-RS485 is a fully NC integrated drive provided with RS485 interfaces and used based on standard Modbus RTU protocol. It can have a multi-axis motion control function through its touch screen or controllers with RS485 communication interfaces. The user can control up to 31 drives at the same time. Each drive is provided with 8 internal positions and supports automatic internal position switching, homing, position triggerring, JOG and other functions.

II. Mounting

2.1 Electrical indexes

➢ Voltage input range: DC20V～50V

➢ Max. peak current: 5.6A

➢ Communication interface: RS485

➢ Communication protocol: Modbus RTU

➢ Motor parameter self-regulation

➢ Provided with overvoltage and overcurrent protection functions, etc.

2.2 Storage and mounting environment

➢ Storage temperature: -20℃～65℃

➢ Operating temperature: 0℃～50℃

➢ Operating humidity: 40～90%RH (without condensation)

➢ Vibration frequency: < 0.5G (4.9m/s2), 10~60 Hz (non-continuous operation)

➢ Places with dust, oil stain, corrosive gases, high humidity and vibration should be avoided. Combustible gases and conductive dust should be prohibited

2.3 Mounting dimensions
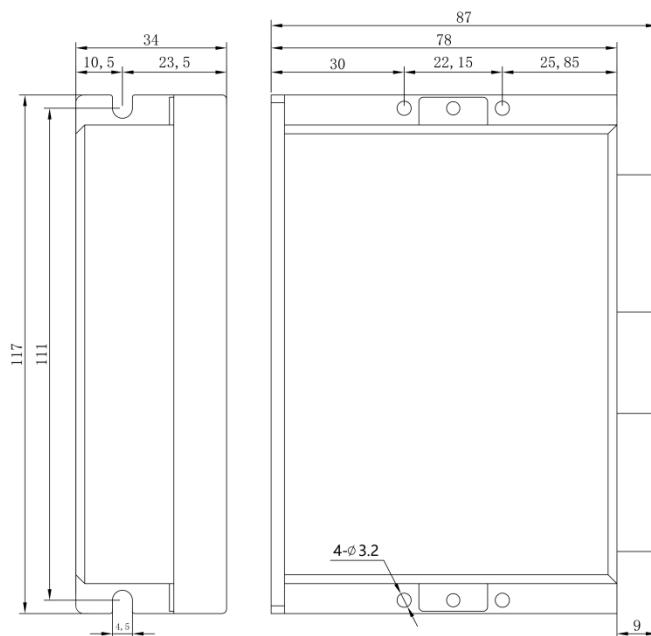
III. Wiring

3.1 Description of communication terminals

Pin	Network cable color	Signal definition
1		
2		
3	White/green	GND
4	Blue	485+
5	White/blue	485-
6		
7		
8		
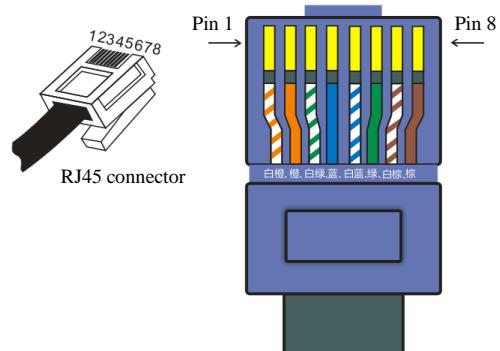
3.2 DI/DO terminal description
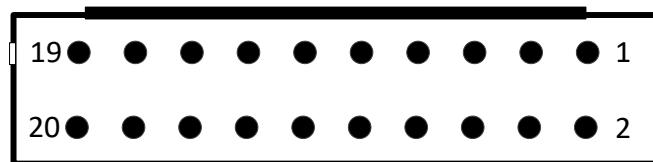
Pin definition of drive control terminals (drive socket)

| Terminal SN	Functions	Description	Terminal SN	Functions	Description
1	IN1+	Positive terminal of Digital Input Terminal 1	11	IN6+	Positive terminal of Digital Input Terminal 6
2	IN1-	Negative terminal of Digital Input Terminal 1	12	IN6-	Negative terminal of Digital Input Terminal 6
3	IN2+	Positive terminal of Digital Input Terminal 2	13	NC	Reserved
4	IN2-	Negative terminal of Digital Input Terminal 2	14	NC	Reserved
5	IN3+	Positive terminal of Digital Input Terminal 3	15	OUT1+	Positive terminal of Digital Output Terminal 1
6	IN3-	Negative terminal of Digital Input Terminal 3	16	OUT1-	Negative terminal of Digital Output Terminal 1
7	IN4+	Positive terminal of Digital Input Terminal 4	17	OUT2+	Positive terminal of Digital Output Terminal 2
8	IN4-	Negative terminal of Digital Input Terminal 4	18	OUT2-	Negative terminal of Digital Output Terminal 2
9	IN5+	Positive terminal of Digital Input Terminal 5	19	OUT3+	Positive terminal of Digital Output Terminal 3
10	IN5-	Negative terminal of Digital Input Terminal 5	20	OUT3-	Negative terminal of Digital Output Terminal 3

3.3 Description of power terminal

Terminal name	Function description
GND	Negative terminal of DC power supply input
VDC	Positive terminal of DC power supply input
A+	Motor A-phase winding
A-	
B+	Motor B-phase winding
B-	

3.4 Communication network wiring

Controlled through PLC   Controlled through touch

screen
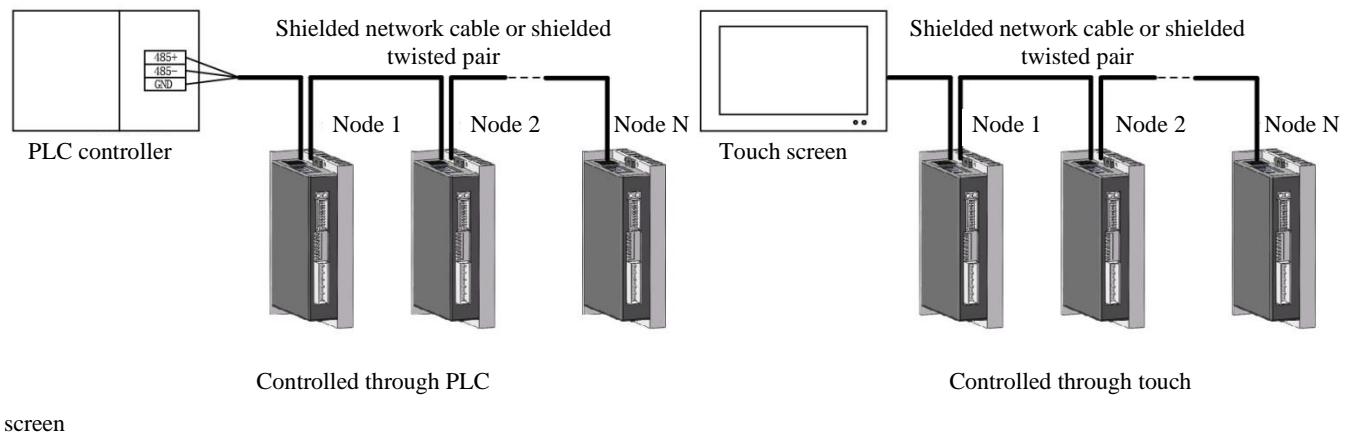
3.5 DI/DO terminal wiring
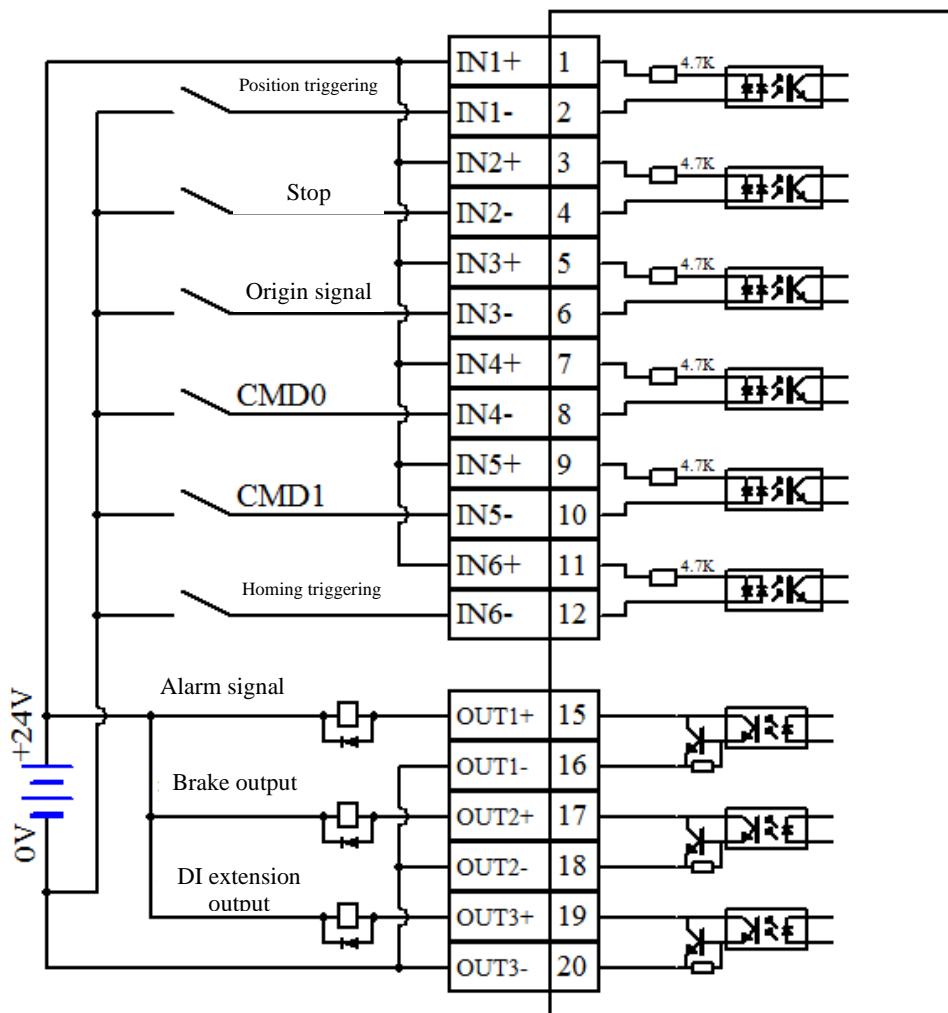
3.6 Description of DI port function configuration

IN port	Function configuration parameter				Logical status				Filtering parameter			
	No.	Decimal address	Hex address	Default value	No.	Decimal address	Hex address	Default value	No.	Decimal address	Hex address	Default value
IN1	PA_017	114	72	32	PA_016	113	71	0	PA_015	112	70	20
IN2	PA_020	117	75	34	PA_019	116	74	0	PA_018	115	73	20
IN3	PA_023	120	78	39	PA_022	119	77	1	PA_021	118	76	20
IN4	PA_026	123	7B	40	PA_025	122	7A	0	PA_024	121	79	20
IN5	PA_029	126	7E	41	PA_028	125	7D	0	PA_027	124	7C	20
IN6	PA_032	129	81	33	PA_031	128	80	0	PA_030	127	7F	20

① **Function configuration parameters:** After setting the configuration parameters corresponding to the IN port to the values in the IN function command table, the function of this command can be available for this IN port, for example (PA_017 set to 32 indicates that the IN1 input port has a position segment triggering function, so internal position operation can be triggered after IN1 is connected).

IN function command table (**the functions can be used by setting the function configuration parameters of the IN port to the corresponding command values**)

Command value	Function description	Detailed description
32	Position segment triggering	When the logic configuration is 0 and the external signal is connected, the position segment corresponding to the current selection switch will be triggered for running. When the logic configuration is 1 and the external signal is disconnected, the position segment corresponding to the current selection switch will be triggered for running.
33	Homing	When the logic configuration is 0 and the external signal is connected, the homing of the motor will be triggered. When the logic configuration is 1 and the external signal is disconnected, the homing of the motor will be triggered.
34	Stop	When the logic configuration is 0 and the external signal is connected, the Stop command will be enabled. When the logic configuration is 1 and the external signal is disconnected, the Stop command will be enabled. When the Stop command is enabled, the current command will be canceled, and the operation will be stopped immediately. Even if the command fails, the motor will not automatically run again, so a retriggering is needed.
35	Positive running	When the logic configuration is 0 and the external signal is connected, the positive running at the JOG velocity will be allowed. When the logic configuration is 1 and the external signal is disconnected, the positive running at the JOG velocity will be allowed.
36	Negative running	When the logic configuration is 0 and the external signal is connected, the negative running at the JOG velocity will be allowed. When the logic configuration is 1 and the external signal is disconnected, the negative running at the JOG velocity will be allowed.
37	Positive limit	When the logic configuration is 0 and the external signal is disconnected, the positive limit stop will be enabled, and the motor will stop. When the logic configuration is 1 and the external signal is connected, the positive limit stop will be enabled, and the motor will stop.
38	Negative limit	When the logic configuration is 0 and the external signal is disconnected, the negative limit stop will be enabled, and the motor will stop. When the logic configuration is 1 and the external signal is connected, the negative limit stop will be enabled, and the motor will stop.
39	Origin	When the logic configuration is 0 and the external signal is disconnected, the Origin signal will be effective. When the logic configuration is 1 and the external signal is connected, the Origin signal will be effective.
40	CMD0	When the logic configuration is 0 and the external signal is connected, the selection switch command will be enabled. When the logic configuration is 1 and the external signal is disconnected, the selection switch command will be enabled. After the combination of selection switches, refer to Section 6.6.2 for the corresponding position segment.
41	CMD1	
42	CMD2	
44	Pause	When the logic configuration is 0 and the external signal is connected, the Pause command will be enabled. When the logic configuration is 1 and the external signal is disconnected, the Pause command will be enabled.
45	Yes	When the logic configuration is 0 and the external signal is connected, the Enable command will be enabled. When the logic configuration is 1 and the external signal is disconnected, the Enable command will be enabled.

② **Logic state:** Normally open or normally closed state of the IN port can be set. 0: Normally open; 1: Normally closed.

③ **Filtering parameter:** The response time of the IN port can be set to avoid false triggering caused by external interference.

3.7 Description of DO port function configuration

DO port	Function configuration parameter				Logical status			
	No.	Decimal address	Hex address	Default value	No.	Decimal address	Hex address	Default value
DO0	PA_34	143	8F	2	PA_33	142	8E	0
DO1	PA_36	145	91	4	PA_35	144	90	0
DO2	PA_38	147	93	1	PA_37	146	92	0

Function command table of DO port

Command value	Function description
1	Digital IO expansion
2	Fault alarm
4	Internal contracting brake
16	DI0 status
17	DI1 status
18	DI2 status
19	DI3 status
20	DI4 status
21	DI5 status

IV. List of Parameters

No.	Decimal address	Hexadecimal address	Name	Default value	Property
DP_001	94	5E	Command position L (monitoring)	0	R
DP_002	95	5F	Command position H (monitoring)	0	R
DP_003	98	62	Given velocity (monitoring)	0	R
DP_004	100	64	Power supply voltage (monitoring)	0	R
DP_005	101	65	Peak current (monitoring)	0	R
DP_006	102	66	A-phase midpoint (monitoring)	0	R
DP_007	103	67	B-phase midpoint (monitoring)	0	R
DP_008	106	6A	DI/DO status monitoring Bit0: IN1 status Bit1: IN2 status Bit2: IN3 status Bit3: IN4 status Bit4: IN5 status Bit5: IN6 status Bit9: OUT1 status Bit10: OUT2 status Bit11: OUT3 status	0	R

DP_009	8193	2001	Running status word Bit0: Ready signal Bit1: Alarm signal Bit2: Positioning completion signal Bit3: Homing completion signal Bit4: Velocity-reached signal Bit5: Limit-triggered signal	0	R
DP_010	214	D6	Current fault	0	R
DP_011	215	D7	Historical Fault 1	0	R
DP_012	216	D8	Historical Fault 2	0	R
DP_013	217	D9	Historical Fault 3	0	R
DP_014	218	DA	Historical Fault 4	0	R
AF_001	250	FA	Parameter saving 1: Save all parameters; Restoring to 0 is allowed	0	W
AF_002	251	FB	Restore factory parameters 1: Restore factory settings; Restoring to 0 is allowed	0	W
AF_003	253	FD	Clearing historical fault 1: Clear historical fault records; Restoring to 0 is allowed	0	W
PA_001	1	1	Running current percentage of motor	70	R/W
PA_002	3	3	Max. current percentage of motor	100	R/W
PA_003	4	4	Fault detection setting 0x2083: With homing timeout alarm. 0x0083: Without homing timeout alarm.	131	R/W
PA_004	6	6	Filtering time setting	3200	R/W
PA_005	7	7	Half-current time setting	100	R/W
PA_006	8	8	Half-current ratio setting	40	R/W
PA_007	9	9	Enabling level setting 0: Disabled by default for servo; 1: Enabled by default for servo;	1	R/W
PA_008	10	0A	Disabling mode setting 0: When disabling is selected, the motor will be unlocked; 0: When disabling is selected, the motor will be locked, however command-oriented running will not be allowed;	0	R/W
PA_009	11	0B	Release delay of internal contracting brake	400	R/W
PA_010	12	0C	Locking delay of internal contracting brake	1000	R/W
PA_00E	14	0E	Number of pulses per revolution	10000	R/W
PA_011	23	17	Proportionality factor of current loop		R/W
PA_012	24	18	Integral coefficient of current loop		R/W
PA_013	26	1A	Enabling fault clearing signal selection 0: Enable alarm clearing not required 1: Enable alarm clearing required	0	R/W
PA_014	111	6F	Automatic homing selection after powering on 0: Automatic homing not required 1: Automatic homing after powering on	0	R/W
PA_015	112	70	In1 input filtering time	20	R/W

PA_016	113	71	In1 input polarity logic	0	R/W
PA_017	114	72	In1 function selection	20	R/W
PA_018	115	73	In2 input filtering time	20	R/W
PA_019	116	74	In2 input polarity logic	0	R/W
PA_020	117	75	In2 function selection	22	R/W
PA_021	118	76	In3 input filtering time	20	R/W
PA_022	119	77	In3 input polarity logic	0	R/W
PA_023	120	78	In3 function selection	27	R/W
PA_024	121	79	In4 input filtering time	20	R/W
PA_025	122	7A	In4 input polarity logic	0	R/W
PA_026	123	7B	In4 function selection	28	R/W
PA_027	124	7C	In5 input filtering time	20	R/W
PA_028	125	7D	In5 input polarity logic	0	R/W
PA_029	126	7E	In5 function selection	29	R/W
PA_030	127	7F	In6 input filtering time	20	R/W
PA_031	128	80	In6 input polarity logic	0	R/W
PA_032	129	81	In6 function selection	21	R/W
PA_033	142	8E	Out1 output polarity logic	0	R/W
PA_034	143	8F	Out1 function selection	2	R/W
PA_035	144	90	Out2 output polarity logic	0	R/W
PA_036	145	91	Out2 function selection	4	R/W
PA_037	146	92	Out3 output polarity logic	0	R/W
PA_038	147	93	Out3 function selection	1	R/W
PA_039	8192	2000	Digital IO extension setting	0	R/W
PA_040	8194	2002	Running control word 0x1m: Triggering running at the internal position of Segment m (e.g. 0x10, indicating the internal position of Segment 0); 0x20: Triggering homing; 0x21: Setting the current position as zero point; 0x38:JOG+； 0x58:JOG-； 0x40: Emergency stop; 0x80: Pause, continuing running allowed.	0	R/W
PA_041	8195	2003	Position N mode See Section 6.6 for the details	0	R/W
PA_042	8196	2004	Position N, L	0	R/W
PA_043	8197	2005	Position N, H	30000	R/W
PA_044	8198	2006	Position N velocity	500	R/W
PA_045	8199	2007	Position N acceleration time	200	R/W
PA_046	8200	2008	Position N deceleration time	50	R/W
PA_047	8201	2009	JOG velocity	200	R/W
PA_048	8202	200A	JOG acceleration time	200	R/W
PA_049	8203	200B	JOG deceleration time	100	R/W
PA_050	8204	200C	Homing mode For the details, see page 13	4	R/W
PA_051	8205	200D	Low offset position after homing	0	R/W
PA_052	8206	200E	High offset position after homing	0	R/W
PA_053	8207	200F	Homing high-velocity	300	R/W
PA_054	8208	2010	Homing low-velocity	30	R/W

PA_055	8209	2011	Homing acceleration time	100	R/W
PA_056	8210	2012	Homing deceleration time	100	R/W
PA_057	8211	2013	Stop deceleration time	10	R/W
PA_058	8212	2014	Emergency stop deceleration time	50	R/W
PA_059	8704	2200	Position 0 mode See Section 6.6 for the details	0	R/W
PA_060	8705	2201	Position 0, L	0	R/W
PA_061	8706	2202	Position 0, H	0	R/W
PA_062	8707	2203	Running Velocity 0, unit (rpm)	0	R/W
PA_063	8708	2204	Acceleration Time 0, unit (ms)	100	R/W
PA_064	8709	2205	Deceleration Time 0, unit (ms)	100	R/W
PA_065	8710	2206	Position 0 delay, unit (ms) After the operation, delay to go to the next segment	100	R/W
PA_066	8712	2208	Position 1 mode See Section 6.6 for the details	0	R/W
PA_067	8713	2209	Position 1, L	0	R/W
PA_068	8714	220A	Position 1, H	0	R/W
PA_069	8715	220B	Running Velocity 1, unit (rpm)	0	R/W
PA_070	8716	220C	Acceleration Time 1, unit (ms)	100	R/W
PA_071	8717	220D	Deceleration Time 1, unit (ms)	100	R/W
PA_072	8718	220E	Position 1 delay, unit (ms) After the operation, delay to go to the next segment	100	R/W
PA_073	8720	2210	Position 2 mode See Section 6.6 for the details	0	R/W
PA_074	8721	2211	Position 2, L	0	R/W
PA_075	8722	2212	Position 2, H	0	R/W
PA_076	8723	2213	Running Velocity 2, unit (rpm)	0	R/W
PA_077	8724	2214	Acceleration Time 2, unit (ms)	100	R/W
PA_078	8725	2215	Deceleration Time 2, unit (ms)	100	R/W
PA_079	8726	2216	Position 2 delay, unit (ms) After the operation, delay to go to the next segment	100	R/W
PA_080	8728	2218	Position 3 mode See Section 6.6 for the details	0	R/W
PA_081	8729	2219	Position 3, L	0	R/W
PA_082	8730	221A	Position 3, H	0	R/W
PA_083	8731	221B	Running Velocity 3, unit (rpm)	0	R/W
PA_084	8732	221C	Acceleration Time 3, unit (ms)	100	R/W
PA_085	8733	221D	Deceleration Time 3, unit (ms)	100	R/W
PA_086	8734	221E	Position 3 delay, unit (ms) After the operation, delay to go to the next segment	100	R/W
PA_087	8736	2220	Position 4 mode See Section 6.6 for the details	0	R/W
PA_088	8737	2221	Position 4, L	0	R/W
PA_089	8738	2222	Position 4, H	0	R/W
PA_090	8739	2223	Running Velocity 4, unit (rpm)	0	R/W
PA_091	8740	2224	Acceleration Time 4, unit (ms)	100	R/W
PA_092	8741	2225	Deceleration Time 4, unit (ms)	100	R/W

PA_093	8742	2226	Position 4 delay, unit (ms) After the operation, delay to go to the next segment	100	R/W
PA_094	8744	2228	Position 5 mode See Section 6.6 for the details	0	R/W
PA_095	8745	2229	Position 5, L	0	R/W
PA_096	8746	222A	Position 5, H	0	R/W
PA_097	8747	222B	Running Velocity 5, unit (rpm)	0	R/W
PA_098	8748	222C	Acceleration Time 5, unit (ms)	100	R/W
PA_099	8749	222D	Deceleration Time 5, unit (ms)	100	R/W
PA_100	8750	222E	Position 5 delay, unit (ms) After the operation, delay to go to the next segment	100	R/W
PA_101	8752	2230	Position 6 mode See Section 6.6 for the details	0	R/W
PA_102	8753	2231	Position 6, L	0	R/W
PA_103	8754	2232	Position 6, H	0	R/W
PA_104	8755	2233	Running Velocity 6, unit (rpm)	0	R/W
PA_105	8756	2234	Acceleration Time 6, unit (ms)	100	R/W
PA_106	8757	2235	Deceleration Time 6, unit (ms)	100	R/W
PA_107	8758	2236	Position 6 delay, unit (ms) After the operation, delay to go to the next segment	100	R/W
PA_108	8760	2238	Position 7 mode. See Section 6.6 for the details	0	R/W
PA_109	8761	2239	Position 7, L	0	R/W
PA_110	8762	223A	Position 7, H	0	R/W
PA_111	8763	223B	Running Velocity 7, unit (rpm)	0	R/W
PA_112	8764	223C	Acceleration Time 7, unit (ms)	100	R/W
PA_113	8765	223D	Deceleration Time 7, unit (ms)	100	R/W
PA_114	8766	223E	Position 7 delay, unit (ms) After the operation, delay to go to the next segment	100	R/W
PA_115	27	1B	0: Without odd / even parity check; 1: Odd parity check; 2: Even parity check	0	R/W

V. Communication description

This drive supports the standard Modbus RTU protocol under the 8-bit Data and 1-bit Stop design without odd / even parity checks. The baud rate and station number can be set through the dialing switch, see the following table for the details:

5.1 Baud rate setting

Baud rate	9600	19200	38400	57600	76800	115200
SW6	ON	OFF	ON	OFF	ON	OFF
SW7	ON	ON	OFF	OFF	ON	ON
SW8	ON	ON	ON	ON	OFF	OFF

5.2 Station number setting

Station number	SW5	SW4	SW3	SW2	SW1	Station number	SW5	SW4	SW3	SW2	SW1
1	ON	ON	ON	ON	OFF	17	OFF	ON	ON	ON	OFF
2	ON	ON	ON	OFF	ON	18	OFF	ON	ON	OFF	ON
3	ON	ON	ON	OFF	OFF	19	OFF	ON	ON	OFF	OFF
4	ON	ON	OFF	ON	ON	20	OFF	ON	OFF	ON	ON
5	ON	ON	OFF	ON	OFF	21	OFF	ON	OFF	ON	OFF
6	ON	ON	OFF	OFF	ON	22	OFF	ON	OFF	OFF	ON
7	ON	ON	OFF	OFF	OFF	23	OFF	ON	OFF	OFF	OFF
8	ON	OFF	ON	ON	ON	24	OFF	OFF	ON	ON	ON
9	ON	OFF	ON	ON	OFF	25	OFF	OFF	ON	ON	OFF
10	ON	OFF	ON	OFF	ON	26	OFF	OFF	ON	OFF	ON
11	ON	OFF	ON	OFF	OFF	27	OFF	OFF	ON	OFF	OFF
12	ON	OFF	OFF	ON	ON	28	OFF	OFF	OFF	ON	ON
13	ON	OFF	OFF	ON	OFF	29	OFF	OFF	OFF	ON	OFF
14	ON	OFF	OFF	OFF	ON	30	OFF	OFF	OFF	OFF	ON
15	ON	OFF	OFF	OFF	OFF	31	OFF	OFF	OFF	OFF	OFF
16	OFF	ON	ON	ON	ON						

VI. Description of Common Functions

6.1 Description of running control word (PA_040)

Running control word PA_040 (parameter address 0x2002) - the corresponding operations can be triggered by setting different command values, see the following table for the details:

Command value (hex)	Function description
0x1m	Triggering the internal position running of Segment m Example: When PA_040 = 0x10, the motor will run according to the internal position of Segment 0 (PA_059~PA_065). When m is higher than 7, e.g. PA_ 040=0x18, the motor will run according to the internal position of Segment N (PA_41~PA_46);
0x20	Triggering homing starting
0x21	Setting the current position as zero point
0x38	JOG+
0x58	JOG-
0x40	Emergency stop - canceling the current command, however the motor is still enabled.
0x80	Pause, continuing running allowed.

6.2 Description of running status word (DP_009)

Running status word DP_009 (parameter address 0x2001) - the current running status of the drive can be judged based on binary bits, see the following table for the details:

Binary bits of DP_009	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0
Current drive status	Limit triggered	Velocity reached	Homing completed	Positioning completed	Alarm signal	Ready signal

6.3 DI/DO status monitoring

The current status of DI/DO port can be monitored via Parameter DP_008 (parameter address: 0x6A), see the following table for the corresponding details:

Binary bit of DP_08	Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0
Corresponding DI ports	/	/	DI5	DI4	DI3	DI2	DI1	DI0
Binary bit of DP_08	Bit15	Bit14	Bit13	Bit12	Bit11	Bit10	Bit9	Bit8
Corresponding DO ports	/	/	/	/	DO2	DO1	DO0	/

6.4 Saving parameters (AF_001)

After setting AF_ 001 to 1, all parameters can be saved to the memory chip to prevent information loss due to power failure. After this parameter is set to 1, it will automatically change to 0 without manual setting.

Note: Do not save parameters frequently, otherwise drive failure may be caused.

6.5 Initializing parameters (AF_002)

After setting AF_002 to 1, all parameters can be restored to the factory default values. After this parameter is set to 1, it will automatically change to 0 without manual setting.

6.6 Description of internal positions

6.6.1 Description of position mode

Related parameters	Description
PA_059	Position 0 mode
PA_066	Position 1 mode
PA_073	Position 2 mode
PA_080	Position 3 mode
PA_087	Position 4 mode
PA_094	Position 5 mode
PA_101	Position 6 mode
PA_108	Position 7 mode

By setting the parameters of the above table, the functions shown in the following table can be realized: Delayed internal position segment jump - Jumping to the corresponding path and absolute value after running

Binary bit	Function description							
Bit7	0: OFF - Absolute position control mode; 1: ON - Relative position control mode							
	Selection of position segment for automatic jumping							
	Position Segment 0	Position Segment 1	Position Segment 2	Position Segment 3	Position Segment 4	Position Segment 5	Position Segment 6	Position Segment 7
Bit8	0	**1**	0	**1**	0	**1**	0	**1**
Bit9	0	0	**1**	**1**	0	0	**1**	**1**
Bit10	0	0	0	0	**1**	**1**	**1**	**1**
Bit15	0: Skipping not allowed when selecting OFF ; 1: After ON selection and waiting delay, the next internal position segment to be automatically jumped to is dependent on the arrangement of bit8/bit9/bit10							

Example: 1. When Bit7 of the current PA_ 059 is set to 1, Position 0 will be a relative one;

2. When Bit15 of PA_ 059 is set to 1, and Bit8, Bit9, and Bit10 are all 1, it will automatically jump and start to operate position 7 after triggering position 0.

6.6.2 Description of internal position control mode

① **Controlling internal positions through external wiring of IN port**

　　Selecting the position segment to be switched through CMD0~CMD2, and then enable the selected position segment through the **position segment triggering input port**.

② **Controlling internal positions through control word**

|	Position segment	Position 0	Position 1	Position 2	Position 3	Position 4	Position 5	Position 6	Position 7
Switching through external wiring	CMD0	ON	OFF	ON	OFF	ON	OFF	ON	OFF
	CMD1	ON	ON	OFF	OFF	ON	ON	OFF	OFF
	CMD2	ON	ON	ON	ON	OFF	OFF	OFF	OFF
Switching through control word	PA_40 value	16	17	18	19	20	21	22	23
Position segment parameter	Position mode	8704	8712	8720	8728	8736	8744	8752	8760
	Position address, L	8705	8713	8721	8729	8737	8745	8753	8761
	Position address, H	8706	8714	8722	8730	8738	8746	8754	8762
	16th segment of displacement	8707	8715	8723	8731	8739	8747	8755	8763
	Acceleration time	8708	8716	8724	8732	8740	8748	8756	8764
	Deceleration time	8709	8717	8725	8733	8741	8749	8757	8765
	Pause delay	8710	8718	8726	8734	8742	8750	8758	8766

Note: After PA_ 40 is set to the value shown in the above table, the operation of the corresponding position segment can be started. This parameter value needs to be manually set to 0.

6.7 Description of homing mode (PA_050)

| Binary bits of PA_50	Bit2	Bit1	Bit0
Description of corresponding functions	Fixed to 1	Offset or not after homing 0: Offset not allowed; 1: Automatically run to offset position after homing (PA_051, PA_052)	Homing direction setting 0: Homing Mode 1 1: Homing Mode 2

The homing modes are shown below, which can be selected by switching homing directions.
Homing Mode 1: Refer to the origin mode description of the negative origin switch

Motion trajectory

Negative origin switch signal
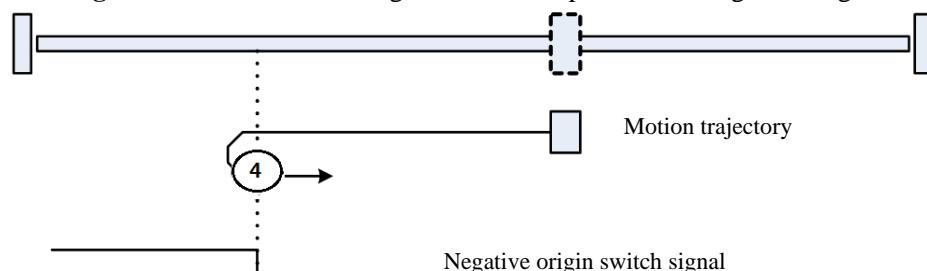
The origin switch is in the negative mechanical direction. The machine runs towards the origin switch and will decelerate and stop after sensing the origin switch, and then leave the origin in the opposite direction. When the falling edge position of the origin switch signal is recorded as the origin, and the motor will stop immediately.
Homing Mode 2: Refer to the origin mode description of the positive origin switch

Motion trajectory

Positive origin
switch signal
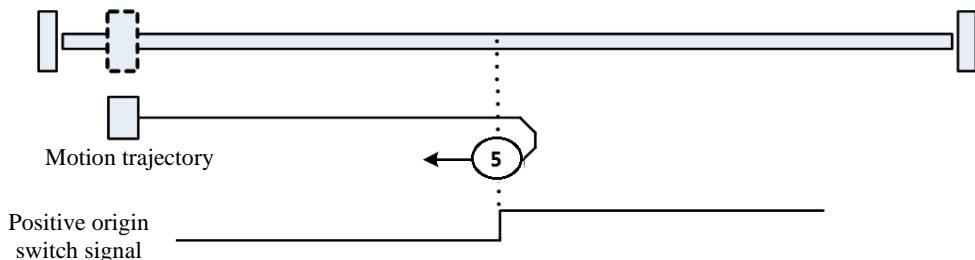
The origin switch is in the positive mechanical direction. The machine runs towards the origin switch and will decelerate and stop after sensing the origin switch, and then leave the origin in the opposite direction. When the falling edge position of the origin switch signal is recorded as the origin, and the motor will stop immediately.

7. Description of communication support function codes

7.1 Parameter reading command (0x03)

Command sent by master station (PLC, etc.):

Byte order	Command example	Functional symbols	Functions
1st Byte	0x01	Slave Addr	Slave address, here is 1
2nd Byte	0x03	CMD	Function code, here is 0x03, indicating that it is a command to read parameters
3rd Byte	0x00	Start AddrH	Upper 8 bits of the starting address of the read parameter
4th Byte	0x62	Start AddrL	Lower 8 bits of the starting address of the read parameter
5th Byte	0x00	Num_ High(Byte)	Upper 8 bits of the number of read parameters Note: The number here refers to how many registers (words), not how many bytes.
6th Byte	0x01	Num_Low(Byte)	Lower 8 bits of the number of read parameters
7th Byte	0x25	CRC_H	High bit of CRC check. CRC check refers to the CRC checksum of the 1st to the previous byte (here is the 6th byte).
8th Byte	0xD4	CRC_L	Low bit of CRC check.

[For the above example: A parameter is read from the master station with the slave station address set as 1 and the starting address, as 98(0x0062), namely, two bytes are read]

Slave station (drive) response:

Byte order	Command example	Functional symbols	Functions
1st Byte	0x01	Slave Addr	Slave address, here is 1
2nd Byte	0x03	CMD	Function code, 0x03, corresponding to the master command
3rd Byte	0x02	Data Lenth	Data length of the response, unit: bytes
4th Byte	0x00	Data0	Data 0 (high bit of the 1st register)
5th Byte	0x00	Data0	Data 0 (low bit of the 1st register)
6th Byte	0Xb8	CRC_H	High bit of CRC check. CRC check refers to the CRC checksum of the 1st to the previous byte (here is the 9th byte).
7th Byte	0x44	CRC_L	Low bit of CRC check.

[Responded data0: 0x0000;]

7.2 Single-register writing command (0x06)

Command sent by master station (PLC, etc.):

Byte order	Command example	Functional symbols	Functions
1st Byte	0x01	Slave Addr	Slave address, here is 1
2nd Byte	0x06	CMD	Function code, here is 0x06, indicating that it is to write a parameter command
3rd Byte	0x00	Start AddrH	Upper 8 bits of the starting address of the written parameter
4th Byte	0x70	Start AddrL	Lower 8 bits of the starting address of the written parameter
5th Byte	0x00	DATA(0)	Upper 8 bits of the written data.
6th Byte	0x14	DATA(1)	Lower 8 bits of the written data.
7th Byte	0x88	CRC_H	High bit of CRC check. CRC check refers to the CRC checksum of the 1st to the previous byte (here is the 6th byte).
8th Byte	0x1E	CRC_L	Low bit of CRC check.

[For the above example: A parameter is written from the master station with the slave station address set as 1 and the starting address, as 112(0x0070), the value is 20(0x0014)]

Slave station (drive) response:

Byte order	Command example	Functional symbols	Functions
1st Byte	0x01	Slave Addr	Slave address, here is 1
2nd Byte	0x06	CMD	Function code, 0x06, corresponding to the master command
3rd Byte	0x00	Start AddrH	Upper 8 bits of the starting address of the written parameter
4th Byte	0x70	Start AddrL	Lower 8 bits of the starting address of the written parameter
5th Byte	0x00	DATA(0)	Upper 8 bits of the written data.
6th Byte	0x14	DATA(1)	Lower 8 bits of the written data.
7th Byte	0x88	CRC_H	High bit of CRC check. CRC check refers to the CRC checksum of the 1st to the previous byte (here is the 6th byte).
8th Byte	0x1E	CRC_L	Low bit of CRC check.

7.3 Muiti-register writing command (0x10)

Command sent by master station (PLC, etc.):

Byte order	Command example	Functional symbols	Functions
1st Byte	0x01	Slave Addr	Slave address, here is 1
2nd Byte	0x10	CMD	Function code, here is 0x10, indicating that it is to write multiple parameter commands
3rd Byte	0x22	Start AddrH	Upper 8 bits of the starting address of the written parameter
4th Byte	0x39	Start AddrL	Lower 8 bits of the starting address of the written parameter
5th Byte	0x00	NUM_H	Upper 8 bits of the number of parameters (registers) written
6th Byte	0x02	NUM_L	Lower 8 bits of the number of parameters (registers) written
7th Byte	0x04	Data Length	The number of bytes of the parameter written is twice the number of registers
8th Byte	0x38	DATA(0)	Upper 8 bits of the first data written.
9th Byte	0x80	DATA(0)	Lower 8 bits of the first data written.
10th Byte	0x00	DATA(1)	Upper 8 bits of the second data written.
11th Byte	0x01	DATA(1)	Lower 8 bits of the second data written.
16th Byte	0x7D	CRC_H	High bit of CRC check. CRC check refers to the CRC checksum of the 1st to the previous byte (here is the 6th byte).
17th Byte	0x38	CRC_L	Low bit of CRC check.

[For the above example: 4 parameters are written from the master station with the slave station address set as 1 and the starting address, as 300(0x012C), the values are: 1000(0x03E8),

2000(0x07D0)、3000（0x0BB8）、4000(0x0FA0)]

Slave station (drive) response:

Byte order	Command example	Functional symbols	Functions
1st Byte	0x01	Slave Addr	Slave address, here is 1
2nd Byte	0x10	CMD	Function code, 0x10, corresponding to the master command
3rd Byte	0x22	Start AddrH	Upper 8 bits of the starting address of the written parameter
4th Byte	0x39	Start AddrL	Lower 8 bits of the starting address of the written parameter
5th Byte	0x00	NUM_H	Upper 8 bits of the number of parameters to be written (number of registers).
6th Byte	0x02	NUM_L	Lower 8 bits of the number of parameters to be written (number of registers).
7th Byte	0x9B	CRC_H	High bit of CRC check. CRC check refers to the CRC checksum of the 1st to the previous byte (here is the 6th byte).
8th Byte	0xBD	CRC_L	Low bit of CRC check.

7.4 Abnormal response and error code

Regardless of the read or write command, if the slave responds abnormally, its response frame is changed. As follows

Byte order	Command example	Functional symbols	Functions
1st Byte	0x01	Slave Addr	Slave address, here is 1
2nd Byte	0x06	CMD|0x80	Highest Position 1 of function code
3rd Byte	0x04	Error Code	Error code. There are the following types:
			0x02: Illegal address
			0x03: Illegal data
			0x04: Refused to execute
4th Byte	0x10	CRC_H	High bit of CRC check. CRC check refers to the CRC checksum of the 1st to the previous byte (here is the 3rd byte).
5th Byte	0x00	CRC_L	Low bit of CRC check.

VIII. Handling of Faults

Fault	Solution
The red light is normally On or flashes once every 3 seconds	Drive overcurrent alarm - Check the motor power line for being in good conditions or unplug the motor power line and only supply power to the drive. If the fault still exists, it indicates that the drive has an internal fault and shall be sent back to the factory for maintenance.
The red light flashes twice every 3 seconds	Drive overvoltage alarm - Check the input voltage for being within the required power supply range
The red light flashes continuously for 9 times	Homing timeout alarm - If this alarm is unwanted, just set PA_03 to 0x0083.
Motor wobbling	1. If the motor is out of step due to too high velocity, just reduce the velocity. 2. If the motor is out of step due to heavy load, just lighten the load. 3. The motor wobbles due to the phase loss of the motor power line. Check the motor power line for being normal.
The motor can be enabled normally but cannot be triggered for running	Use the control word to trigger the emergency stop, then check the internal position parameters for being set incorrectly and try to trigger the position operation again.
Abnormal homing	The default logic status corresponding to the origin switch of the DI port is 1. Check the parameter for being set correctly.