



Unit-RollerCAN

CAN Control Protocol

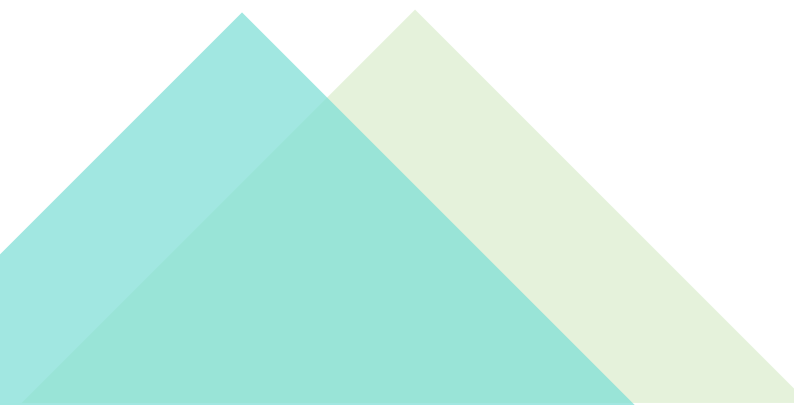


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1、Communication Protocol Structure

1.1 Communication Protocol Parameters

Uses CAN 2.0 Communication Interface.

The recommended communication speed is 1 Mbps, and it uses the extended frame format.

Data Field	29-bit ID			8Byte Data Area
Byte Position	bit24~28	bit8~23	bit0~7	Byte0~Byte7
Description	Data Type	Host ID +Parameter setting	Target Address	Data Area1

2、Configure Register

2.1 Obtain Device ID

- **Function Description:** Requests a specified ID to check if the device communication is functioning correctly. Command Packet Format
- **Command Code:** 00H
- **Command Packet Format:**

Data Field	29-bit ID			8Byte Data Area
Byte Position	bit24~28	bit8~23	bit0~7	Byte0~Byte7
Description	0	bit8~15: Used to Identify the Host CAN ID	Target Motor CAN ID	0

- **Example:**

Function	Frame ID	Data Frame
Obtain Device ID	000000A8	00, 00, 00, 00, 00, 00, 00, 00

- **Response Frame:**

Data Field	29-bit ID			8Byte Data Area
Byte Position	bit24~28	bit8~23	bit0~7	Byte0~Byte7
Description	0	Target Motor CAN ID	FE	0

2.2 Motor Feedback Data

- **Function Description:** Used to obtain the motor's current status information, including speed, position, current, and voltage.
- **Command Code:** 02H
- **Command Packet Format:**

Data Field	29-bit ID			8Byte Data Area
Byte Position	bit24~28	bit8~23	bit0~7	Byte0~Byte7
Description	2	bit8~bit15: Current Motor CAN ID bit16~18: Fault Information (0: No, 1: Yes) bit18: Out of Range bit17: Stall bit16: Overvoltage Fault bit19~21: Mode 1: Speed Mode 2: Position Mode 3: Current Mode 4: Encoder Mode bit22~23: Status 0: Standby 1: Running 2: Error	Host CAN ID	Byte0~1: Current Speed [-32768~32767], Unit (rpm) Byte2~3: Current Position [-32768~32767], Unit (°) Byte4~5: Current Current [-32768~32767], Unit (mA) Byte6~7: Current Input Voltage [-32768~32767], Unit (V)

2.3 Motor Enable Operation

- **Function Description:** Enables the motor and puts it into operation. This command starts the motor and makes it enter a preset operation mode.

- Command Code: 03H
- Command Packet Format:

Data Field	29-bit ID			8Byte Data Area
Byte Position	bit24~28	bit8~23	bit0~7	Byte0~Byte7
Description	3	bit15~8: Used to Identify the Host CAN ID	Target Motor CAN ID	0
Response Frame: Motor Feedback Response Frame (See Communication Type 2)				

- Example:

Function	Frame ID	Data Frame
Motor Enable Operation	030000A8	00, 00, 00, 00, 00, 00, 00, 00

2.4 Motor Stop Operation

- Function Description: Stops the motor's operation. Sending this command immediately halts the motor.
- Command Code: 04H
- Command Packet Format:

Data Field	29-bit ID			8Byte Data Area
Byte Position	bit24~28	bit8~23	bit0~7	Byte0~Byte7
Description	4	bit8~15: Used to Identify the Host CAN ID	Target Motor CAN ID	0
Response Frame: Motor Feedback Response Frame (See Communication Type 2)				

- Example:

Function	Frame ID	Data Frame
Motor Enable Operation	040000A8	00, 00, 00, 00, 00, 00, 00, 00

2.5 Set Motor CAN ID

- Function Description: Sets the motor's CAN communication ID. This command

assigns a unique communication identifier to the motor.

- Command Code: 07H
- Command Packet Format:
- Function: Change the current motor CAN ID, effective immediately.

Data Field	29-bit ID			8Byte Data Area
Byte Position	bit24~28	bit8~23	bit0~7	Byte0~Byte7
Description	7	bit8~15: Used to Identify the Host CAN ID bit:16~23: Preset CAN ID	Target Motor CAN ID	0
Response Frame: Motor Broadcast Response Frame (See Communication Type 0)				

- Example:

Function	Frame ID	Data Frame	Note
Set Motor ID	070100A8	00, 00, 00, 00, 00, 00, 00, 00	Set Motor ID 为 01
Set Motor ID	07A80001	00, 00, 00, 00, 00, 00, 00, 00	Set Motor ID 为 A8

2.6 Disable Motor Stall Protection

- Function Description: Releases the motor from stall protection mode. This command clears the stall lock after a stall, allowing the motor to resume operation.
- Command Code: 09H
- Command Packet Format:

Data Field	29-bit ID			8Byte Data Area
Byte Position	bit24~28	bit8~23	bit0~7	Byte0~Byte7
Description	9	bit8~15: Used to Identify the Host CAN ID	Target Motor CAN ID	0
Response Frame: Motor Feedback Response Frame (See Communication Type 2)				

- Example:

Function	Frame ID	Data Frame
Release Motor Stall Protection	090000A8	00, 00, 00, 00, 00, 00, 00, 00

2.7 Save Parameters to Flash

- **Function Description:** Saves the current parameters to Flash memory. This command permanently stores the current motor settings inside the device.
- **Command Code:** 0AH
- **Command Packet Format:**

Data Field	29-bit ID			8Byte Data Area
Byte Position	bit24~28	bit8~23	bit0~7	Byte0~Byte7
Description	10	bit8~15: Used to Identify the Host CAN ID bit16~23: Preset CAN ID	Target Motor CAN ID	0
Response Frame: Motor Feedback Response Frame (See Communication Type 2)				

- **Example:**

Function	Frame ID	Data Frame
Save Parameters to Flash	0A0000A8	00, 00, 00, 00, 00, 00, 00, 00

2.8 Set Motor CAN BPS, Immediate Effect

- **Function Description:** Sets the motor's CAN communication speed. This function adjusts the communication speed between the motor and the host.
- **Command Code:** 0BH
- **Command Packet Format:**

Data Field	29-bit ID			8Byte Data Area
Byte Position	bit24~28	bit8~23	bit0~7	Byte0~Byte7
Description	11	bit8~15: Used to Identify the Host CAN ID bit16~23: Preset CAN BPS	Target Motor CAN ID	0

		(0:1Mbps,1:500Kbps,2:125Kbps)		
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- Example:

Function	Frame ID	Data Frame
Set Motor Communication as 1Mbps	0B0000A8	00, 00, 00, 00, 00, 00, 00, 00
Set Motor Communication as 500Kbps	0B0100A8	00, 00, 00, 00, 00, 00, 00, 00
Set Motor Communication as 125Kbps	0B0200A8	00, 00, 00, 00, 00, 00, 00, 00

- Response Frame:

Data Field	29-bit ID			8Byte Data Area
Byte Position	bit24~28	bit8~23	bit0~7	Byte0~Byte7
Description	11	bit8~15: Used to Identify the Host CAN ID bit16~23: Preset CAN BPS (0:1Mbps,1:500Kbps,2:125Kbps)	Motor CAN ID	0

2.9 Enable Motor Stall Protection

- Function Description: Enables the motor's stall protection function. This function automatically detects stalls and protects the motor from damage.
- Command Code: 0CH
- Command Packet Format:

Data Field	29-bit ID			8Byte Data Area
Byte Position	bit24~28	bit8~23	bit0~7	Byte0~Byte7
Description	12	bit8~15: Used to Identify the Host CAN ID	Target Motor CAN ID	0
Response Frame: Motor Feedback Response Frame (See Communication Type 2)				

- Example:

Function	Frame ID	Data Frame
Motor Enable Stall Protection	0C0000A8	00 00 00 00 00 00 00 00

2.10 Disable Motor Stall Protection (Communication Type 13)

- **Function Description:** Disables the motor's stall protection function. This is used to turn off the motor's automatic stall protection mechanism.
- **Command Code:** 0DH
- **Command Packet Format:**

Data Field	29-bit ID			8Byte Data Area
Byte Position	bit24~28	bit8~23	bit0~7	Byte0~Byte7
Description	13	bit8~15: Used to Identify the Host CAN ID	Target Motor CAN ID	0
Response Frame: Motor Feedback Response Frame (See Communication Type 2)				

- **Example:**

Function	Frame ID	Data Frame
Motor Disable Stall Protection	0D0000A8	00 00 00 00 00 00 00 00

2.11 Read Single Parameter

- **Function Description:** Reads the motor's related parameter information. This command returns real-time data such as motor speed and position.
- **Command Code:** 11H
- **Command Packet Format:**

Data Field	29-bit ID			8Byte Data Area
Byte Position	bit24~28	bit8~23	bit0~7	Byte0~Byte7
Description	17	bit8~15: Used to Identify the Host CAN ID	Target Motor CAN ID	Byte0~1: index Byte2~3: 00 Byte4~7:00

- **Example:**

Function	Frame ID	Data Frame
Read Motor Enable Status	110000A8	04, 70, 00, 00, 00, 00, 00, 00
Read Motor Mode	110000A8	05, 70, 00, 00, 00, 00, 00, 00
Read Motor Current	110000A8	06, 70, 00, 00, 00, 00, 00, 00
Read Motor Speed	110000A8	0A, 70, 00, 00, 00, 00, 00, 00
Read Motor Position	110000A8	16, 70, 00, 00, 00, 00, 00, 00
Read Motor Position Mode Maximum Current	110000A8	17, 70, 00, 00, 00, 00, 00, 00
Read Motor Speed Mode Maximum Current	110000A8	18, 70, 00, 00, 00, 00, 00, 00
Read Motor Speed Mode Kp	110000A8	20, 70, 00, 00, 00, 00, 00, 00
Read Motor Speed Mode Ki	110000A8	21, 70, 00, 00, 00, 00, 00, 00
Read Motor Speed Mode Kd	110000A8	22, 70, 00, 00, 00, 00, 00, 00
Read Motor Position Mode Kp	110000A8	23, 70, 00, 00, 00, 00, 00, 00
Read Motor Position Mode Ki	110000A8	24, 70, 00, 00, 00, 00, 00, 00
Read Motor Position Mode Kd	110000A8	25, 70, 00, 00, 00, 00, 00, 00
Read Motor Real-time Speed	110000A8	30, 70, 00, 00, 00, 00, 00, 00
Read Motor Real-time Position	110000A8	31, 70, 00, 00, 00, 00, 00, 00
Read Motor Real-time Current	110000A8	32, 70, 00, 00, 00, 00, 00, 00
Read Motor Input Voltage Value	110000A8	34, 70, 00, 00, 00, 00, 00, 00
Read Motor Temperature	110000A8	35, 70, 00, 00, 00, 00, 00, 00
Read Motor RGB Mode	110000A8	50, 70, 00, 00, 00, 00, 00, 00
Read Motor RGB Color	110000A8	51, 70, 00, 00, 00, 00, 00, 00
Read Motor RGB Brightness	110000A8	52, 70, 00, 00, 00, 00, 00, 00

● Response Frame:

Data Field	29-bit ID			8Byte Data Area
Byte Position	bit24~28	bit8~23	bit0~7	Byte0~Byte7
Description	17	bit8~15: Used to Identify the Host CAN ID	Motor CAN ID	Byte0~1: index, Parameter list, see Table 1 Byte2~3: 00 Byte4~7:Parameter data, 1 Byte, Data is in Byte 4

2.12 Write Single Parameter (Lost on Power-Off)

- **Function Description:** Writes the set parameters to the motor. This command allows you to change the motor's working parameters.

- Command Code: 12H
- Command Packet Format:

Data Field	29-bit ID			8Byte Data Area
Byte Position	bit24~28	bit8~23	bit0~7	Byte0~Byte7
Description	18	bit8~15: Used to Identify the Host CAN ID	Target Motor CAN ID	Byte0~1: index, see Table 1 Byte2~3: 00 Byte4~7: Parameter data
Response Frame: Motor Feedback Response Frame (See Communication Type 2)				

- Example:

Function	Frame ID	Data Frame	备注
Set Motor Current	120000A8	06, 70, 00, 00, 40, 0D, 03, 00	
Speed Mode			
Set Motor Mode to Speed Mode	120000A8	05, 70, 00, 00, 01, 00, 00, 00	
Set Motor Speed to 3000 rpm	120000A8	0A, 70, 00, 00, E0, 93, 04, 00	16V Actual Motor Speed: 2340 rpm
Set Motor Speed Current to 2000 mA	120000A8	18, 70, 00, 00, 40, 0D, 03, 00	16V Actual Motor Operating Current: 80-100 mA
Start Motor	120000A8	04, 70, 00, 00, 01, 00, 00, 00	
Stop Motor	120000A8	04, 70, 00, 00, 00, 00, 00, 00	
Set Motor Speed to -3000 rpm	120000A8	0A, 70, 00, 00, 20, 6C, FB, FF	16V Actual Motor Speed: -2340 rpm
Start Motor	120000A8	04, 70, 00, 00, 01, 00, 00, 00	
Stop Motor	120000A8	04, 70, 00, 00, 00, 00, 00, 00	
Position Mode			
Set Motor to Position Mode	120000A8	05, 70, 00, 00, 02, 00, 00, 00	
Set Motor Position to 20000	120000A8	16, 70, 00, 00, 80, 84, 1E, 00	
Start Motor	120000A8	04, 70, 00, 00, 01, 00, 00, 00	
Stop Motor	120000A8	04, 70, 00, 00, 00, 00, 00, 00	
Set Motor Position to -20000	120000A8	16, 70, 00, 00, 80, 7B, E1, FF	
Start Motor	120000A8	04, 70, 00, 00, 01, 00, 00, 00	
Stop Motor	120000A8	04, 70, 00, 00, 00, 00, 00, 00	

Current Mode			
Set Motor to Current Mode	120000A8	05, 70, 00, 00, 03, 00, 00, 00	
Set Motor Current to 3000	120000A8	06, 70, 00, 00, E0, 93, 04, 00	Upper Limit Display: 1200, 16V Actual Motor Operating Current: 80-90 mA
Start Motor	120000A8	04, 70, 00, 00, 01, 00, 00, 00	
Stop Motor	120000A8	04, 70, 00, 00, 00, 00, 00, 00	
Set Motor Current to -3000	120000A8	06, 70, 00, 00, 20, 6C, FB, FF	Lower Limit Display: -1200, 16V Actual Motor Operating Current: 80-90 mA
Start Motor	120000A8	04, 70, 00, 00, 01, 00, 00, 00	
Stop Motor	120000A8	04, 70, 00, 00, 00, 00, 00, 00	
Encoder Mode			
Set Motor to Encoder Mode	120000A8	05, 70, 00, 00, 04, 00, 00, 00	
Set Motor Encoder to 20000	120000A8	33, 70, 00, 00, 80, 84, 1E, 00	
Start Motor	120000A8	04, 70, 00, 00, 01, 00, 00, 00	
Stop Motor	120000A8	04, 70, 00, 00, 00, 00, 00, 00	
Set Motor Encoder to -20000	120000A8	33, 70, 00, 00, 80, 7B, E1, FF	
Start Motor	120000A8	04, 70, 00, 00, 01, 00, 00, 00	
Stop Motor	120000A8	04, 70, 00, 00, 00, 00, 00, 00	
Speed Mode PID Setting			
Set Motor to Speed Mode	120000A8	05, 70, 00, 00, 01, 00, 00, 00	
Speed Mode Kp X100000 Int 15	120000A8	20, 70, 00, 00, 00, 6A, 18, 00	
Speed Mode Ki X10000000 Int 0.02	120000A8	21, 70, 00, 00, 40, 0D, 03, 00	
Speed Mode Kd X100000 Int 500	120000A8	22, 70, 00, 00, 80, F0, FA, 02	
Start Motor	120000A8	04, 70, 00, 00, 01, 00, 00, 00	
Stop Motor	120000A8	04, 70, 00, 00, 00, 00, 00, 00	
Position Mode PID Setting			
Set Motor to Position Mode mode	120000A8	05, 70, 00, 00, 02, 00, 00, 00	
Position Mode Kp X100000 Int 15	120000A8	23, 70, 00, 00, 00, 6A, 18, 00	
Position Mode Ki X10000000 Int 0.02	120000A8	24, 70, 00, 00, 40, 0D, 03, 00	
Position Mode Kd X100000 Int 500	120000A8	25, 70, 00, 00, 80, F0, FA, 02	
Start Motor	120000A8	04, 70, 00, 00, 01, 00, 00, 00	
Stop Motor	120000A8	04, 70, 00, 00, 00, 00, 00, 00	
Other Setting			

Write a number greater than 1 to Save Parameters to Flash	120000A8	02, 70, 00, 00, 02, 00, 00, 00	
Write a number greater than 1 to Release Motor Stall Protection	120000A8	03, 70, 00, 00, 02, 00, 00, 00	
Set RGB to Custom Mode	120000A8	50, 70, 00, 00, 01, 00, 00, 00	
Set RGB Brightness	120000A8	52, 70, 00, 00, 32, 00, 00, 00	
Set RGB Color to White	120000A8	51, 70, 00, 00, FF, FF, FF, 00	
Set RGB Color to Purple	120000A8	51, 70, 00, 00, 80, 00, 80, 00	
Set RGB Color to Gray	120000A8	51, 70, 00, 00, 80, 80, 80, 00	
Set RGB Color to Blue	120000A8	51, 70, 00, 00, FF, 00, 00, 00	

3、CAN to I2C Forwarding Control Command Set

This command set is used to send control commands and perform data read/write operations on the Roller485 motor's I2C port via CAN interface commands.

3.1 I2C Slave Parameter Read

The CAN to I2C interface allows control of additional Roller series motors.

- **Function Description:** Reads the parameters of an I2C slave device through the CAN interface. It is used to retrieve data from a connected I2C device.
- **Command Code:** 13H
- **Command Packet Format:**

Data Field	29-bit ID			8Byte Data Area
Byte Position	bit24~28	bit8~23	bit0~7	Byte0~Byte7
Description	19	bit8~15: Used to Identify the Host CAN ID	Target Motor CAN ID	Byte0~1: index see Table 1 Byte2~3: I2C Address Byte4~7: 00

- **Example:**

Note: A8 is the ID of the main Motor, 64 is the ID of the slave Motor

Function	Frame ID	Data Frame
Motor Status and Mode Reading		

Read Motor Enable Status	130000A8	04, 70, 64, 00, 00, 00, 00, 00
Read Motor Mode	130000A8	05, 70, 64, 00, 00, 00, 00, 00
Read Motor Current	130000A8	06, 70, 64, 00, 00, 00, 00, 00
Read Motor Speed	130000A8	0A, 70, 64, 00, 00, 00, 00, 00
Read Motor Position	130000A8	16, 70, 64, 00, 00, 00, 00, 00
Control Parameter Reading		
Read Motor Position Mode Maximum Current	130000A8	17, 70, 64, 00, 00, 00, 00, 00
Read Motor Speed Mode Maximum Current	130000A8	18, 70, 64, 00, 00, 00, 00, 00
Read Motor Speed Mode Kp	130000A8	20, 70, 64, 00, 00, 00, 00, 00
Read Motor Speed Mode Ki	130000A8	21, 70, 64, 00, 00, 00, 00, 00
Read Motor Speed Mode Kd	130000A8	22, 70, 64, 00, 00, 00, 00, 00
Read Motor Position Mode Kp	130000A8	23, 70, 64, 00, 00, 00, 00, 00
Read Motor Position Mode Ki	130000A8	24, 70, 64, 00, 00, 00, 00, 00
Read Motor Position Mode Kd	130000A8	25, 70, 64, 00, 00, 00, 00, 00
Real-Time Motor Data Reading		
Read Motor Real-time Speed	130000A8	30, 70, 64, 00, 00, 00, 00, 00
Read Motor Real-time Position	130000A8	31, 70, 64, 00, 00, 00, 00, 00
Read Motor Real-time Current	130000A8	32, 70, 64, 00, 00, 00, 00, 00
Read Motor Input Voltage Value	130000A8	34, 70, 64, 00, 00, 00, 00, 00
Read Motor Temperature	130000A8	35, 70, 64, 00, 00, 00, 00, 00
Motor RGB Mode and Display		
Read Motor RGB Mode	130000A8	50, 70, 64, 00, 00, 00, 00, 00
Read Motor RGB Color	130000A8	51, 70, 64, 00, 00, 00, 00, 00
Read Motor RGB Brightness	130000A8	52, 70, 64, 00, 00, 00, 00, 00

● Response Frame:

Data Field	29-bit ID			8Byte Data Area
Byte Position	bit24~28	bit8~23	bit0~7	Byte0~Byte7
Description	19	bit8~15: Used to Identify the Host CAN ID	Motor CAN ID	Byte0~1: index, Parameter list, see Table 1 Byte2~3: 00 Byte4~7:Parameter data, 1 Byte, Data is in Byte 4

3.2 I2C Slave Parameter Write (Lost on Power-Off)

- **Function Description:** Writes parameters to an I2C slave device through the CAN interface. This command sends control or setting data to the I2C device.
- **Command Code:** 14H
- **Command Packet Format:**

Data Field	29-bit ID			8Byte Data Area
Byte Position	bit24~28	bit8~23	bit0~7	Byte0~Byte7
Description	20	bit8~15: Used to Identify the Host CAN ID	Target Motor CAN ID	Byte0~1: Index, see Table 1 Byte2~3: I2C Address Byte4~7: Parameter data
Response Frame: Motor Feedback Response Frame (See Communication Type 2)				

- **Example:**

Function	Frame ID	Data Frame
Set Motor Current	140000A8	06, 70, 64, 00, 40, 0D, 03, 00
Speed Mode		
Set Motor Mode to Speed Mode	140000A8	05, 70, 64, 00, 01, 00, 00, 00
Set Motor Speed to 3000 rpm	140000A8	0A, 70, 64, 00, E0, 93, 04, 00
Set Motor Speed Current to 2000 mA	140000A8	18, 70, 64, 00, 40, 0D, 03, 00
Start Motor	140000A8	04, 70, 64, 00, 01, 00, 00, 00
Stop Motor	140000A8	04, 70, 64, 00, 00, 00, 00, 00
Set Motor Speed to -3000 rpm	140000A8	0A, 70, 64, 00, 20, 6C, FB, FF
Start Motor	140000A8	04, 70, 64, 00, 01, 00, 00, 00
Stop Motor	140000A8	04, 70, 64, 00, 00, 00, 00, 00
Position Mode		
Set Motor to Position Mode	140000A8	05, 70, 64, 00, 02, 00, 00, 00
Set Motor Position to 20000	140000A8	16, 70, 64, 00, 80, 84, 1E, 00
Start Motor	140000A8	04, 70, 64, 00, 01, 00, 00, 00
Stop Motor	140000A8	04, 70, 64, 00, 00, 00, 00, 00
Set Motor Position to -20000	140000A8	16, 70, 64, 00, 80, 7B, E1, FF

Start Motor	140000A8	04, 70, 64, 00, 01, 00, 00, 00
Stop Motor	140000A8	04, 70, 64, 00, 00, 00, 00, 00
Current Mode		
Set Motor to Current Mode	140000A8	05, 70, 64, 00, 03, 00, 00, 00
Set Motor Current to 3000	140000A8	06, 70, 64, 00, E0, 93, 04, 00
Start Motor	140000A8	04, 70, 64, 00, 01, 00, 00, 00
Stop Motor	140000A8	04, 70, 64, 00, 00, 00, 00, 00
Set Motor Current to -3000	140000A8	06, 70, 64, 00, 20, 6C, FB, FF
Start Motor	140000A8	04, 70, 64, 00, 01, 00, 00, 00
Stop Motor	140000A8	04, 70, 64, 00, 00, 00, 00, 00
Encoder Mode		
Set Motor to Encoder Mode	140000A8	05, 70, 64, 00, 04, 00, 00, 00
Set Motor Encoder to 20000	140000A8	33, 70, 64, 00, 80, 84, 1E, 00
Start Motor	140000A8	04, 70, 64, 00, 01, 00, 00, 00
Stop Motor	140000A8	04, 70, 64, 00, 00, 00, 00, 00
Set Motor Encoder to -20000	140000A8	33, 70, 64, 00, 80, 7B, E1, FF
Start Motor	140000A8	04, 70, 64, 00, 01, 00, 00, 00
Stop Motor	140000A8	04, 70, 64, 00, 00, 00, 00, 00
Speed Mode PID Setting		
Set Motor to Speed Mode	140000A8	05, 70, 64, 00, 01, 00, 00, 00
Speed Mode Kp X100000 Int 15	140000A8	20, 70, 64, 00, 00, 6A, 18, 00
Speed Mode Ki X10000000 Int 0.02	140000A8	21, 70, 64, 00, 40, 0D, 03, 00
Speed Mode Kd X100000 Int 500	140000A8	22, 70, 64, 00, 80, F0, FA, 02
Start Motor	140000A8	04, 70, 64, 00, 01, 00, 00, 00
Stop Motor	140000A8	04, 70, 64, 00, 00, 00, 00, 00
Position Mode PID Setting		
Set Motor to Position Mode	140000A8	05, 70, 64, 00, 02, 00, 00, 00
Position Mode Kp X100000 Int 15	140000A8	23, 70, 64, 00, 00, 6A, 18, 00
Position Mode Ki X10000000 Int 0.02	140000A8	24, 70, 64, 00, 40, 0D, 03, 00
Position Mode Kd X100000 Int 500	140000A8	25, 70, 64, 00, 80, F0, FA, 02
Start Motor	140000A8	04, 70, 64, 00, 01, 00, 00, 00
Stop Motor	140000A8	04, 70, 64, 00, 00, 00, 00, 00
Other Setting		
Write a number greater than 1 to Save Parameters to Flash	140000A8	02, 70, 64, 00, 02, 00, 00, 00
Write a number greater than 1 to Release	140000A8	03, 70, 64, 00, 02, 00, 00, 00

Motor Stall Protection		
Set RGB to Custom Mode	140000A8	50, 70, 64, 00, 01, 00, 00, 00
Set RGB Brightness	140000A8	52, 70, 64, 00, 32, 00, 00, 00
Set RGB Color to White	140000A8	51, 70, 64, 00, FF, FF, FF, 00
Set RGB Color to Purple	140000A8	51, 70, 64, 00, 80, 00, 80, 00
Set RGB Color to Gray	140000A8	51, 70, 64, 00, 80, 80, 80, 00
Set RGB Color to Blue	140000A8	51, 70, 64, 00, FF, 00, 00, 00

3.3 I2C Read Raw

- **Function Description:** Reads raw data from an I2C device via the CAN interface.
This command is used to read unprocessed raw data from the I2C device.
- **Command Code:** 15H
- **Command Packet Format:**

Data Field	29-bit ID			8Byte Data Area
Byte Position	bit24~28	bit8~23	bit0~7	Byte0~Byte7
Description	21	bit8~15: Used to Identify the Host CAN ID	Target Motor CAN ID	Byte0: I2C Address Byte1: Number of Bytes Read, Maximum 8

- **Example:**

Note: The main Motor ID is A8, and the slave Motor ID is 64. Since bit23 (is stop bit) needs to be set to 1, it results in E4.

Write: 16E400A8 Data Frame: 01 Register Address 0 0 0 0 0 0

Read: 150000A8 Data Frame: I2C Address, Requested Data Length 0 0 0 0 0 0

- **Response Frame:**

Data Field	29-bit ID			8Byte Data Area
Byte Position	bit24~28	bit8~23	bit0~7	Byte0~Byte7
Description	21	bit8~15: Used to Identify the Host CAN ID bit16~23: is read success (0: failed, 1: success)	Motor CAN ID	Data Read

3.4 I2C Write Raw

- **Function Description:** Writes raw data to an I2C device via the CAN interface.

This command sends raw control data to the I2C device.

- **Command Code:** 16H
- **Command Packet Format:**

Data Field	29-bit ID			8Byte Data Area
Byte Position	bit24~28	bit8~23	bit0~7	Byte0~Byte7
Description	22	bit8~15: Used to Identify the Host CAN ID bit16~22: I2C Address bit23: is stop bit	Target Motor CAN ID	Byte0: Number of Bytes Written, Max 7 Byte1-Byte7: Data Written

- **Example:**

Note: The main Motor ID is A8, and the slave Motor ID is 64. Since bit23 (is stop bit) needs to be set to 1, it results in E4.

Data Frame: Write Length, Register Address, Data1, Data2, Data3, Data4, Data5, Data6

- **Response Frame:**

Data Field	29-bit ID			8Byte Data Area
Byte Position	bit24~28	bit8~23	bit0~7	Byte0~Byte7
Description	22	bit8~15: Used to Identify the Host CAN ID bit16~23: is write success (0: failed, 1: success)	Motor CAN ID 0	

4、Appendix 1

4.1 Table 1: Readable and Writable Single Parameter List

Table 1: Readable and Writable Single Parameter List						
Parameter index	Parameter name	Description	Type	Byte Length	Unit/Description	R/W Read/Write Permission
7002	save flash	Save Parameters to Flash	uint8	1	Write a number greater than 1 to Save	W

					Parameters to Flash	
7003	release protection	Release Motor Stall Protection	uint8	1	Write a number greater than 1 to Release Motor Stall Protection	W
7004	on/off	Motor Enable/Disable	uint8	1	1: Motor Enable, 0: Motor Off	W/R
7005	run_mode	Motor Mode	uint8	1	1: Speed Mode, 2: Position Mode, 3: Current Mode, 4: Encoder Mode	W/R
7006	current (mA)	Current (X100)	int32_t	4	-120000~120000	W/R
700A	speed (rpm)	Speed (X100)	int32_t	4	-2100000000~2100000000	W/R
7016	position (°)	Position (X100)	int32_t	4	-2100000000~2100000000	W/R
7017	position_max_current	Position Mode Max Current (X100)	int32_t	4	-120000~120000	W/R
7018	speed_max_current	Speed Mode Max Current (X100)	int32_t	4	-120000~120000	W/R
7020	speed_kp	Speed Mode Kp (X100000)	uint32_t	4	P setting Value=0.00001*100000	W/R
7021	speed_ki	Speed Mode Ki (X10000000)	uint32_t	4	I setting value=0.00001*10000000	W/R
7022	speed_kd	Speed Mode Kd (X100000)	uint32_t	4	D setting value=0.00001*100000	W/R
7023	position_kp	Position Mode Kp (X100000)	uint32_t	4	P setting value=0.00001*100000	W/R
7024	position_ki	Position Mode Ki (X10000000)	uint32_t	4	I setting value=0.00001*10000000	W/R
7025	position_kd	Position Mode Kd (X100000)	uint32_t	4	D setting value=0.00001*100000	W/R
7030	Speed Readback	Real-Time Speed (X100)	int32_t	4	Actual speed=Speed Readback/100	R
7031	Position Readback	Real-Time Position (X100)	int32_t	4	Actual position=Position Readback/100	R
7032	Current Readback	Real-Time Current (X100)	int32_t	4	Actual current=Current Readback/100	R
7033	Encoder Counter	Encoder Value	int32_t	4	Only available in Encoder Mode	W/R
7034	VIN	Input Voltage (X100)	int32_t	4	Actual voltage=VIN X100/100	R
7035	Temp	SOC Temperature	int32_t	4		R
7050	rgb mode	RGB Mode	uint8	1	0: System Default, 1: User Custom	W/R
7051	rgb color	RGB Color	uint32_t	4	rgb color = RGB-B + RGB-G * 256 + RGB-R * 65536	W/R
7052	rgb brightness	RGB Brightness	uint8_t	1	0-100	W/R