Unit-Roller485

RS485 Control Protocol

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1、Communication Protocol Structure

1.1 Communication Protocol Parameters

1.1.1 Communication Interface Parameters

Half-duplex asynchronous serial communication is used.
Default baud rate: 115200 bps (other baud rates can be customized).
Data format: 8-bit data (LSB first) with 1 stop bit, no parity bit.

1.2 Data Packet Format

Both the send frame and response frame have a fixed length of 15 bytes. The response frame starts with 0xAA 0x55, and 0xAA 0x55 is not included in the CRC checksum calculation.

1.2.1 Data Packet Format

<table>
<tr><th>Command</th><th>Device ID</th><th>Data1</th><th>Data2</th><th>Data3</th><th>CRC8</th></tr>
<tr><td>1 byte</td><td>1 byte</td><td>4 bytes</td><td>4 bytes</td><td>4 bytes</td><td>1 byte</td></tr>
<tr><td rowspan="4">Explanation:</td><td>Command</td><td colspan="4">Configuration command.</td></tr>
<tr><td>Device ID</td><td colspan="4">Default is 0x00, range 0x00-0xFF.</td></tr>
<tr><td>Data1-3</td><td colspan="4">Each data group is 4 bytes, unused bits can be set to 0.</td></tr>
<tr><td>CRC8</td><td colspan="4">Refer to the code below for the CRC calculation. All returned messages start with 0xAA 0x55, which are not included in the CRC check.</td></tr>
</table>

1.2.2 Configuration Command Response Frame

Command	Device ID	Data1	Data2	Data3	CRC8
1 byte	1 byte	4 bytes	4 bytes	4 bytes	1 byte
Explanation	Command	Response command			
	Device ID	The default device ID is 0x00, and the supported range is 0x00-0xFF.			
	Data1-3	Each data group is 4 bytes, and unused data bits can be set to 0.			
	CRC8	Refer to the following code for CRC value calculation. All returned messages start with 0xAA 0x55, and 0xAA 0x55 is not included in the CRC check.			

1.2.3 CRC8

```
uint8_t crc8(uint8_t *data, uint8_t len) {
    uint8_t crc, i;
    crc = 0x00;
    while (len--) {
        crc ^= *data++;
        for (i = 0; i < 8; i++) {
            if (crc & 0x01) {
                crc = (crc >> 1) ^ 0x8c;
            } else
                crc >>= 1;
        }
    }
    return crc;
}
```

2、 Configuration Command Set

2.1 Mode Switch

- Function: Motor enable switch.
- Input Parameter：

  Motor ID(1 byte)： Device address.

  Status(1 byte)：

Parameter	Function	description
0x00	Motor Disable	Motor off
0x01	Motor Enable	Motor on

- Command Code: 00H
- Command Packet Format:

Command	Device ID	Data1	Data2	Data3	CRC8
1 byte	1 byte	4 bytes	4 bytes	4 bytes	1 byte
0x00	Motor ID	Status	Reserve	Reserve	CRC8

- Response Packet Format:

Command	Device ID	Data1	Data2	Data3	CRC8
1 byte	1 byte	4 bytes	4 bytes	4 bytes	1 byte
0x10	Motor ID	Status	Reserve	Reserve	CRC8

- Example of Send Packet:

00 00 01 00 00 00 00 00 00 00 00 00 00 00 68

- Example of Response Packet:

10 00 01 00 00 00 00 00 00 00 00 00 00 00 9A

2.2 Mode Setting

- Function: Motor operating mode setting.
- Input Parameter：

Motor ID(1 byte)：Device address.

Mode(1 byte)：

Parameter	Function	Description
0x01	Speed Mode	Speed control mode: The motor runs at the specified target speed.
0x02	Position Mode	Position control mode: The motor moves to the specified position.
0x03	Current Mode	Current control mode: The motor runs with the specified target current.
0x04	Encoder Mode	Encoder mode: The device acts as an input device, collecting current encoder values.

- Command Code： 01H
- Command Packet Format：

Command	Device ID	Data1	Data2	Data3	CRC8
1 byte	1 byte	4 bytes	4 bytes	4 bytes	1 byte
0x01	Motor ID	Mode	Reserve	Reserve	CRC8

- Response Packet Format：

Command	Device ID	Data1	Data2	Data3	CRC8
1 byte	1 byte	4 bytes	4 bytes	4 bytes	1 byte
0x11	Motor ID	Mode	Reserve	Reserve	CRC8

- Example of Send Packet：

01 00 01 00 00 00 00 00 00 00 00 00 00 00 44

- Example of Response Packet：

11 00 01 00 00 00 00 00 00 00 00 00 00 00 B6

2.3 Remove Protection

- Function：Unlock Jam protection. When Jam lock protection is triggered, send this command to unlock.
- Input Parameter：

  Motor ID(1 byte)：Device address

  Status (1 byte)：

  1：Remove Jam Protection

- Command Code： 06H
- Command Packet Format：

Command	Device ID	Data1	Data2	Data3	CRC8
1 byte	1 byte	4 bytes	4 bytes	4 bytees	1 byte
0x06	Motor ID	Reserve	Status	Reserve	CRC8

- Response Packet Format：

Command	Device ID	Data1	Data2	Data3	CRC8
1 byte	1 byte	4 bytes	4 bytes	4 bytes	1 byte
0x16	Motor ID	Reserve	Status	Reserve	CRC8

- Example of Send Packet：

06 00 00 00 00 00 01 00 00 00 00 00 00 00 AB

- Example of Response Packet：

16 00 00 00 00 00 00 00 00 00 00 00 00 00 1A

2.4 Save to Flash

- Function：Save configuration parameters to internal Flash.
- Input Parameter：

  Motor ID(1 byte)：Device address

  Status (1 byte)：

  1：Execute save

- Command Code： 07H

- Command Packet Format：

Command	Device ID	Data1	Data2	Data3	CRC8
1 byte	1 byte	4 bytes	4 bytes	4 bytes	1 byte
0x07	Motor ID	Status	Reserve	Reserve	CRC8

- Response Packet Format：

Command	Device ID	Data1	Data2	Data3	CRC8
1 byte	1 byte	4 bytes	4 bytes	4 bytes	1 byte
0x17	Motor ID	Status	Reserve	Reserve	CRC8

- Example of Send Packet：

07 00 01 00 00 00 00 00 00 00 00 00 00 00 AC

- Example of Response Packet：

17 00 01 00 00 00 00 00 00 00 00 00 00 00 5E

2.5 Encoder

- Function：Set the current encoder value.
- Input Parameter：

  Motor ID(1 byte)：Device address

  Encoder(4 byte)：

  Encoder value(int32_t) Encoder = Encoder-byte0 + Encoder-byte1 * 256 + Encoder-byte2 * 65536 + Encoder-byte3 * 16777216

- Command Code： 08H
- Command Packet Format：

Command	Device ID	Data1	Data2	Data3	CRC8
1 byte	1 byte	4 bytes	4 bytes	4 bytes	1 byte
0x08	Motor ID	Encoder	Reserve	Reserve	CRC8

- Response Packet Format：

Command	Device ID	Data1	Data2	Data3	CRC8
1 byte	1 byte	4 bytes	4 bytes	4 bytes	1 byte

0x18	Motor ID	Encoder	Reserve	Reserve	CRC8

- Example of Send Packet:

08 00 64 00 00 00 00 00 00 00 00 00 00 00 06

- Example of Response Packet:

18 00 64 00 00 00 00 00 00 00 00 00 00 00 F4

2.6 Button Switch Mode

- Function: Enable button mode switching.
- Input Parameter:

  Motor ID(1 byte): Device address

  Status (1 byte):

  0: Disable button mode switching

  1: Enable button mode switching (press for 5 seconds to switch motor working mode)

- Command Code: 09H
- Command Packet Format:

Command	Device ID	Data1	Data2	Data3	CRC8
1 byte	1 byte	4 bytes	4 bytes	4 bytes	1 byte
0x09	Motor ID	Status	Reserve	Reserve	CRC8

- Response Packet Format:

Command	Device ID	Data1	Data2	Data3	CRC8
1 byte	1 byte	4 bytes	4 bytes	4 bytes	1 byte
0x19	Motor ID	Status	Reserve	Reserve	CRC8

- Example of Send Packet:

09 00 01 00 00 00 00 00 00 00 00 00 00 00 3D

- Example of Response Packet：

19 00 01 00 00 00 00 00 00 00 00 00 00 CF

2.7 RGB LED Control

- Function：Control RGB LED color, brightness, and working mode.
- Input Parameter：

  Motor ID(1 byte)：Device address

  Status (4 byte)：

    Byte0：RGB-R value

    Byte1：RGB-G value

    Byte2：RGB-B value

    Byte3：RGB Mode:

      0: Default system state display

      1: User-defined control

  Brightness (1 byte)：

      0-100: Brightness value

- Command Code： 0AH
- Command Packet Format：

Command	Device ID	Data1	Data2	Data3	CRC8
1 byte	1 byte	4 bytes	4 bytes	4 bytes	1 byte
0x0A	Motor ID	Status	Brightness	Reserve	CRC8

- Response Packet Format：

Command	Device ID	Data1	Data2	Data3	CRC8
1 byte	1 byte	4 bytes	4 bytes	4 bytes	1 byte
0x1A	Motor ID	Status	Brightness	Reserve	CRC8

- Example of Send Packet：

0A 00 FF 32 32 01 C8 00 00 00 00 00 00 00 3C

- Example of Response Packet:

1A 00 FF 32 32 01 C8 00 00 00 00 00 00 00 CE

2.8 RS485 Baud Rate

- Function: Configure the baud rate of the RS485 communication interface.
- Input Parameter:

  Motor ID(1 byte): Device address

  Baud (1 byte):

  0: 115200 bps

  1: 19200 bps

  2: 9600 bps

- Command Code: 0BH
- Command Packet Format:

Command	Device ID	Data1	Data2	Data3	CRC8
1 byte	1 byte	4 bytes	4 bytes	4 bytes	1 byte
0x0B	Motor ID	Baud	Reserve	Reserve	CRC8

- Response Packet Format:

Command	Device ID	Data1	Data2	Data3	CRC8
1 byte	1 byte	4 bytes	4 bytes	4 bytes	1 byte
0x1B	Motor ID	Baud	Reserve	Reserve	CRC8

- Example of Send Packet:

0B 00 00 00 00 00 00 00 00 00 00 00 00 00 0D

- Example of Response Packet:

1B 00 00 00 00 00 00 00 00 00 00 00 00 00 FF

2.9 Device ID

- Function：Configure the device ID.
- Input Parameter：

  Motor ID(1 byte)：Device address

  ID (1 byte)：

  0-255：New device ID

- Command Code： 0CH
- Command Packet Format：

Command	Device ID	Data1	Data2	Data3	CRC8
1 byte	1 byte	4 bytes	4 bytes	4 bytes	1 byte
0x0C	Motor ID	ID	Reserve	Reserve	CRC8

- Response Packet Format：

Command	Device ID	Data1	Data2	Data3	CRC8
1 byte	1 byte	4 bytes	4 bytes	4 bytes	1 byte
0x1C	Motor ID	ID	Reserve	Reserve	CRC8

- Example of Send Packet：

0C 00 01 00 00 00 00 00 00 00 00 00 00 00 A1

- Example of Response Packet：

1C 00 01 00 00 00 00 00 00 00 00 00 00 00 53

2.10 Motor Jam Protection

- Function：Enable motor jam protection. When jam protection is triggered, the motor will stop and lock. You will need to send the “Remove Protection” command to unlock the motor.
- Input Parameter：

  Motor ID(1 byte)：Device address

  Protection (1 byte)：

  0：Disable jam protection

  1：Enable jam protection

- Command Code： 0DH
- Command Packet Format：

Command	Device ID	Data1	Data2	Data3	CRC8
1 byte	1 byte	4 bytes	4 bytes	4 bytes	1 byte
0x0D	Motor ID	Protection	Reserve	Reserve	CRC8

- Response Packet Format：

Command	Device ID	Data1	Data2	Data3	CRC8
1 byte	1 byte	4 bytes	4 bytes	4 bytes	1 byte
0x1D	Motor ID	Protection	Reserve	Reserve	CRC8

- Example of Send Packet：

0D 00 01 00 00 00 00 00 00 00 00 00 00 00 8D

- Example of Response Packet：

1D 00 01 00 00 00 00 00 00 00 00 00 00 00 7F

2.11 Motor Position Over Range Protection

- Function：Configure motor position range protection. When enabled, the motor will stop and enter protection mode if the encoder value is below -2,100,000,000 or above 2,100,000,000.

- Input Parameter：

  Motor ID(1 byte)：Device address

  Protection (1 byte)：

  0：Disable position range protection

  1：Enable position range protection

- Command Code： 0EH
- Command Packet Format：

Command	Device ID	Data1	Data2	Data3	CRC8
1 byte	1 byte	4 bytes	4 bytes	4 bytes	1 byte

0x0E	Motor ID	Protection	Reserve	Reserve	CRC8

- Response Packet Format：

Command	Device ID	Data1	Data2	Data3	CRC8
1 byte	1 byte	4 bytes	4 bytes	4 bytes	1 byte
0x1E	Motor ID	Protection	Reserve	Reserve	CRC8

- Example of Send Packet：

0E 00 01 00 00 00 00 00 00 00 00 00 00 F9

- Example of Response Packet：

1E 00 01 00 00 00 00 00 00 00 00 00 00 0B

3、Speed Loop Control Instruction Set

3.1 Speed Control

- Function：Configure the target running speed and maximum current limit.
- Input Parameter：

  Motor ID(1 byte)：Device address

  Speed (4 byte)：

Speed Setting(int32_t) = Speed Setting-byte0 + Speed Setting-byte1 * 256 + Speed Settingbyte2 * 65536 + Speed Setting-byte3 * 16777216

Actual Speed Setting (RPM) = Speed Setting / 100

Supported input range: -2100000000~+2100000000

Current (4 byte)：

Max Current = Max Current-byte0 + Max Current-byte1 * 256 + Max Current-byte2 * 65536 + Max Current-byte3 * 16777216

Actual Max Current (mA) = Max Current / 100

Supported input range: -120000~+120000

- Command Code： 20H

- Command Packet Format：

Command	Device ID	Data1	Data2	Data3	CRC8
1 byte	1 byte	4 bytes	4 bytes	4 bytes	1 byte
0x20	Motor ID	Speed	Current	Reserve	CRC8

- Response Packet Format：

Command	Device ID	Data1	Data2	Data3	CRC8
1 byte	1 byte	4 bytes	4 bytes	4 bytes	1 byte
0x30	Motor ID	Speed	Current	Reserve	CRC8

- Example of Send Packet：

20 00 80 A9 03 00 C0 D4 01 00 00 00 00 00 7C

- Example of Response Packet：

30 00 80 A9 03 00 C0 D4 01 00 00 00 00 00 8E

3.2 Speed PID Configuration

- Function：Configure speed loop PID parameters.
- Input Parameter：

  Motor ID(1 byte)：Device address

  Speed (4 byte)：

P/I/D(uint32_t): PID = PID-byte0 + PID-byte1 * 256 + PID-byte2 * 65536 + PID-byte3 * 16777216

P setting value = P * 10e5 = P * 100000

I setting value = I * 10e7 = I * 10000000

D setting value = D * 10e5 = D * 100000

- Command Code： 21H
- Command Packet Format：

Command	Device ID	Data1	Data2	Data3	CRC8
1 byte	1 byte	4 bytes	4 bytes	4 bytes	1 byte
0x21	Motor ID	P	I	D	CRC8

- Response Packet Format：

Command	Device ID	Data1	Data2	Data3	CRC8
1 byte	1 byte	4 bytes	4 bytes	4 bytes	1 byte
0x31	Motor ID	P	I	D	CRC8

- Example of Send Packet:

21 00 60 E3 16 00 E8 03 00 00 00 5A 62 02 D8

- Example of Response Packet:

31 00 60 E3 16 00 E8 03 00 00 00 5A 62 02 2A

4、 Position Loop Control Instruction Set

4.1 Position Control

- Function: Configure the number of pulses to control the target rotation to the specified position, while also setting a maximum current limit
- Input Parameter:

  Motor ID(1 byte): Device address

  Position (4 byte):

Position Setting(int32_t) = Position Setting-byte0 + Position Setting-byte1 * 256 + Position Setting-byte2 * 65536 + Position Setting-byte3 * 16777216

Actual Position Setting = Position Setting / 100

Input Range: -2100000000 ~ +2100000000

Current (4 byte):

Max Current = Max Current-byte0 + Max Current-byte1 * 256 + Max Current-byte2 * 65536 + Max Current-byte3 * 16777216

Actual Max Current = Max Current / 100

Support Input Range: -120000 ~ +120000

- Command Code： 22H
- Command Packet Format：

Command	Device ID	Data1	Data2	Data3	CRC8
1 byte	1 byte	4 bytes	4 bytes	4 bytes	1 byte
0x22	Motor ID	Position	Current	Reserve	CRC8

- Response Packet Format：

Command	Device ID	Data1	Data2	Data3	CRC8
1 byte	1 byte	4 bytes	4 bytes	4 bytes	1 byte
0x32	Motor ID	Position	Current	Reserve	CRC8

- Example of Send Packet：

22 00 60 E3 16 00 C0 D4 01 00 00 00 00 00 67

- Example of Response Packet：

32 00 60 E3 16 00 C0 D4 01 00 00 00 00 00 95

4.2 Position PID Configuration

- Function：Configure the PID parameters of the position loop.
- Input Parameter：

  Motor ID(1 byte)：Device address

  Speed (4 byte)：

P/I/D(uint32_t): PID = PID-byte0 + PID-byte1 * 256 + PID-byte2 * 65536 + PID-byte3 * 16777216

P setting value = P * 10e5 = P * 100000

I setting value = I * 10e7 = I * 10000000

D setting value = D * 10e5 = D * 100000

- Command Code： 23H
- Command Packet Format：

Command	Device ID	Data1	Data2	Data3	CRC8
1 byte	1 byte	4 bytes	4 bytes	4 bytes	1 byte

0x23	Motor ID	P	I	D	CRC8

- Response Packet Format：

Command	Device ID	Data1	Data2	Data3	CRC8
1 byte	1 byte	4 bytes	4 bytes	4 bytes	1 byte
0x33	Motor ID	P	I	D	CRC8

- Example of Send Packet：

23 00 60 E3 16 00 1E 00 00 00 00 5A 62 02 73

- Example of Response Packet：

33 00 60 E3 16 00 1E 00 00 00 00 5A 62 2 81

5、 Current Loop Control Instruction Set

5.1 Current Control

- Function：Configure the target running current.
- Input Parameter：

  Motor ID (1 byte)：Device address

  Current (4 byte)：

Current Setting(int32_t) = Current Setting-byte0 + Current Setting-byte1 * 256 + Current Setting-byte2 * 65536 + Current Setting-byte3 * 16777216

Actual Current Setting = Current Setting / 100

Input Range: -120000 ~ +120000

- Command Code： 24H
- Command Packet Format：

Command	Device ID	Data1	Data2	Data3	CRC8
1 byte	1 byte	4 bytes	4 bytes	4 bytes	1 byte
0x24	Motor ID	Current	Reserve	Reserve	CRC8

- Response Packet Format：

Command	Device ID	Data1	Data2	Data3	CRC8
1 byte	1 byte	4 bytes	4 bytes	4 bytes	1 byte
0x34	Motor ID	Current	Reserve	Reserve	CRC8

- Example of Send Packet：

24 00 C0 D4 01 00 00 00 00 00 00 00 00 00 54

- Example of Response Packet：

34 00 C0 D4 01 00 00 00 00 00 00 00 00 00 A6

6、 Status Readback Instruction Set

The format of the request frame and response frame for reading status differs from the configuration command set, with an additional 3 bytes used to represent operating mode, motor status, and error code.

6.1 Motor Status Readback

- Function： Read motor's current speed value, encoder position value, current value, operating mode, motor status, and error code information.

- Input Parameter：

  Motor ID (1 byte): Device address

  Read (1 byte): 0

- Return Parameter：

  Speed (4 byte): Current motor speed(RPM)

  Speed Readback = Speed Readback-byte0 + Speed Readback-byte1 * 256 + Speed Readback-byte2 * 65536 + Speed Readback-byte3 * 16777216

  Actual Speed Readback = Speed Readback / 100

  Position(4 byte): Current motor position

Position Readback = Position Readback-byte0 + Position Readback-byte1 * 256 + Position Readback-byte2 * 65536 + Position Readback-byte3 * 16777216

Actual Position Readback = Position Readback / 100

Current(4 byte): Current motor current(mA)

Current Readback = Current Readback-byte0 + Current Readback-byte1 * 256 + Current Readback-byte2 * 65536 + Current Readback-byte3 * 16777216

Actual Current Readback = Current Readback / 100

Mode(1 byte):

1: Speed Mode

2: Position Mode

3: Current Mode

4: Encoder Mode

Status(1 byte): Current motor status

0: Standby

1: Running

2: Error

Error(1 byte):

1: Overvoltage

2: Stalled

4: Over Range

- Command Code: 40H
- Command Packet Format:

Command	Device ID	Data1	CRC8
1 byte	1 byte	1 byte	1 byte
0x40	Motor ID	Read	CRC8

- Response Packet Format:

Command	Device ID	Data1	Data2	Data3	Data4	Data5	Data6	CRC8
1 byte	1 byte	4 bytes	4 bytes	4 bytes	1 byte	1 byte	1 byte	1 byte
0x50	Motor ID	Speed	Position	Current	Mode	Status	Error	CRC8

- Example of Send Packet:

40 00 00 31

- Example of Response Packet:

50 00 01 00 00 00 78 FB FF FF F7 FF FF FF 01 00 00 8B

6.2 Other Status Readback

- Function: Read the motor's current input voltage, temperature value, current value, operating mode, motor status, and error code information.
- Input Parameter:

  Motor ID(1 byte): Device address

  Read (1 byte): 0

- Return Parameter:

  VIN (4 byte): Input voltage value(V)

  VIN X100 = VIN X100-byte0 + VIN X100-byte1 * 256 + VIN X100-byte2 * 65536 + VIN X100-byte3 * 16777216

  Actual VIN = VIN X100 / 100

  Temp(4 byte): Internal reference temperature value(℃)

  Temp = Temp-byte0 + Temp-byte1 * 256 + Temp-byte2 * 65536 + Temp-byte3 * 16777216

  Encoder Counter(4 byte): Encoder counter value (used in Encoder mode)

  Encoder Counter = Encoder Counter-byte0 + Encoder Counter-byte1 * 256 + Encoder Counter-byte2 * 65536 + Encoder Counter-byte3 * 16777216

  RGB Mode(1 byte): RGB mode

  0: Default system display

  1: User-defined control

  RGB Brightness(1 byte): RGB brightness

  0-100: Brightness value

- Command Code： 41H
- Command Packet Format：

Command	Device ID	Data1	CRC8
1 byte	1 byte	1 byte	1 byte
0x41	Motor ID	Read	CRC8

- Response Packet Format：

Command	Device ID	Data1	Data2	Data3	Data4	Data5	Data6	CRC8
1 byte	1 byte	4 bytes	4 bytes	4 bytes	1 byte	1 byte	1 byte	1 byte
0x51	Motor ID	VIN	Temp	Encoder Counter	RGB Mode	RGB Brightness	Reserve	CRC8

- Example of Send Packet：

41 00 00 9A

- Example of Response Packet：

51 00 1D 05 00 00 2B 00 00 00 00 00 00 00 01 64 00 CD

7、 RS485 to I2C Forwarding Control Instruction Set

This instruction set is used to send control instructions via the RS485 interface to achieve data reading and writing of the I2C port on the Roller485 motor.

7.1 I2C Read Register

- Function：I2C register reading command.
- Input Parameter：

  Motor ID(1 byte)：Device address

  I2C Address (1 byte)：Slave device address

  Register Address Length (1 byte)：

  0：The requested register address is 1 byte long.

  1：The requested register address is 2 bytes long.

  Register (2 byte)：Register address

Data Length (1 byte): Requested data length to be read (maximum support for 16 bytes)

- Return Parameter:

  Read Status (1 byte):

  1: Read successful

  0: Read failed

  Data Length (1 byte): Requested data length

  Data(16 byte): Requested data

- Command Code: 60H
- Command Packet Format:

Command	Device ID	Data1	Data2	Data3	Data4	CRC8
1 byte	1 byte	1 byte	1 byte	2 bytes	1 byte	1 byte
0x60	Motor ID	I2C Address	Register Address Length	Register Address	Data Length	CRC8

- Response Packet Format:

Command	Device ID	Data1	Data2	Data3	Data4	Data5	CRC8
1 byte	1 byte	1 byte	1 byte	1 byte	3 bytes	16 bytes	1 byte
0x70	Motor ID	Read Status	Reserve	Data Length	Reserve	Data	CRC8

- Example of Send Packet:

60 00 29 00 14 00 0C 54

- Example of Response Packet:

70 00 01 00 0C 00 00 00 5F 06 05 00 FF FF 0B A6 00 00 00 4E 00 00 00 00 DC

7.2 I2C Write Register

- Function: I2C register writing command.
- Input Parameter:

  Motor ID(1 byte): Device address

  I2C Address (1 byte): Slave device address

Register Address Length (1 byte):

0: The register address is 1 byte long.

1: The register address is 2 bytes long.

Register (2 byte): Register address

Data Length (1 byte): Data length to write (maximum support for 16 bytes)

Data (16 byte): Data to write

- Return Parameter:

Write Status (1 byte):

1: Write successful

0: Write failed

- Command Code: 61H
- Command Packet Format:

Command	Device ID	Data1	Data2	Data3	Data4	Data5	Data6	CRC8
1 byte	1 byte	1 byte	1 byte	2 bytes	1 byte	3 bytes	16 bytes	1 byte
0x61	Motor ID	I2C Address	Register Address Length	Register Address	Data Length	Reserve	Data	CRC8

- Response Packet Format:

Command	Device ID	Data1	CRC8
1 byte	1 byte	1 byte	1 byte
0x71	Motor ID	Write Status	CRC8

- Example of Send Packet:

61 00 26 00 11 00 01 00 FF 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 15

- Example of Response Packet:

71 00 01 1A

7.3 I2C Read Raw

- Function: I2C raw data reading command.
- Input Parameter:

  Motor ID(1 byte): Device address

  I2C Address (1 byte): Slave device address

  Data Length (1 byte): Requested data length to be read (maximum support for 16 bytes)

- Return Parameter:

  Read Status (1 byte):

  1: Read successful

  0: Read failed

  Data Length (1 byte): Requested data length

  Data(16 byte): Requested data

- Command Code: 62H
- Command Packet Format:

Command	Device ID	Data1	Data2	CRC8
1 byte	1 byte	1 byte	1 byte	1 byte
0x62	Motor ID	I2C Address	Data Length	CRC8

- Response Packet Format:

Command	Device ID	Data1	Data2	Data3	Data4	Data5	CRC8
1 byte	1 byte	1 byte	1 byte	1 byte	3 bytes	16 bytes	1 byte
0x72	Motor ID	Read Status	Reserve	Data Length	Reserve	Data	CRC8

- Example of Send Packet:

62 00 57 03 6C

- Example of Response Packet:

72 00 01 00 03 00 00 00 00 B3 08 00 00 00 00 00 00 00 00 00 00 00 00 00 F1

7.4 I2C Write Raw

- Function: I2C raw data writing command.

- Input Parameter:

  Motor ID(1 byte): Device address

  I2C Address (1 byte): Slave device address

  Data Length (1 byte): Data length to write (maximum support for 16 bytes)

  Stop Bit(1 byte):

  0: No stop bit

  1: Stop bit included

  Data (16 byte): Data to write

- Return Parameter:

  Write Status (1 byte):

  1: Write successful

  0: Write failed

- Command Code: 63H
- Command Packet Format:

Command	Device ID	Data1	Data2	Data3	Data4	Data5	CRC8
1 byte	1 byte	1 byte	1 byte	1 byte	3 bytes	16 bytes	1 byte
0x63	Motor ID	I2C Address	Data Length	Stop Bit	Reserve	Data	CRC8

- Response Packet Format:

Command	Device ID	Data1	CRC8
1 byte	1 byte	1 byte	1 byte
0x73	Motor ID	Write Status	CRC8

- Example of Send Packet:

63 00 57 02 01 00 00 00 01 01 00 00 00 00 00 00 00 00 00 00 00 00 00 00 C1

- Example of Response Packet:

73 00 01 55