



**IN COOPERATION WITH NGI®**

**N83624 CANopen  
V20230415**

# N83624 Series Programming Guide CANopen Protocol

# CANopen

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# 1. Preface

Dear Customers,

First of all, we greatly appreciate your choice of N83624 series battery simulator (N83624 for short). We are also honored to introduce our company, Hunan Next Generation Instrumental T&C Tech. Co., Ltd. (NGI for short).

## **About Company**

NGI is a professional manufacturer of intelligent equipment and test & control instruments, mainly engaged in design, production, sales, installations and maintenance of instruments and meters, electronic products, mechanical equipment, automatic test systems, computer software, automatic control equipment, automatic monitoring and alarm systems.

NGI maintains close cooperation with many universities and scientific research institutions, and maintains close ties with many industry leaders. We strive to develop high-quality, technology-leading products, provide high-end technologies, and continue to explore new industry measurement and control solutions

## **About Manual**

This manual is applied to N83624 series battery simulator, including programming guide based on standard CANopen protocol. The copyright of the manual is owned by NGI. Due to the upgrade of instrument, this manual may be revised without notice in future versions.

This manual has been reviewed carefully by NGI for the technical accuracy. The manufacturer declines all responsibility for possible errors in this operation manual, if due to misprints or errors in copying. The manufacturer is not liable for malfunctioning if the product has not correctly been operated.

To ensure the safety and correct use of N83624, please read this manual carefully, especially the safety instructions.

Please keep this manual for future use.

Thanks for your trust and support.

## 2. Safety Instructions

In the operation and maintenance of the instrument, please strictly comply with the following safety instructions. Any performance regardless of attentions or specific warnings in other chapters of the manual may impair the protective functions provided by the instrument.

NGI shall not be liable for the results caused by the neglect of those instructions.

### 2.1. Safety Notes

- **Confirm the AC input voltage before supplying power.**
- **Reliable grounding:** Before operation, the instrument must be reliably grounded to avoid the electric shock.
- **Confirm the fuse:** Ensure to have installed the fuse correctly.
- **Do not open the chassis:** The operator cannot open the instrument chassis. Non-professional operators are not allowed to maintain or adjust it.
- **Do not operate under hazardous conditions:** Do not operate the instrument under flammable or explosive conditions.
- **Confirm the working range:** Make sure the DUT is within N83624's rated range.

### 2.2. Safety Symbols

Please refer to the following table for definitions of international symbols used on the instrument or in the user manual:

Table 1

| Symbol  | Definition               | Symbol | Definition                |
|---------|--------------------------|--------|---------------------------|
|         | DC (direct current)      | N      | Null line or neutral line |
|         | AC (alternating current) | L      | Live line                 |
|         | AC and DC                | I      | Power-on                  |
|         | Three-phase current      |        | Power-off                 |
|         | Ground                   |        | Back-up power             |
|         | Protective ground        |        | Power-on state            |
|         | Chassis ground           |        | Power-off state           |
|         | Signal ground            |        | Risk of electric shock    |
| WARNING | Hazardous sign           |        | High temperature warning  |
| Caution | Be careful               |        | Warning                   |

### 3. CAN Overview

CANopen is a high-level protocol based on CAN (control area network) serial bus system and CAL (CAN application layer). CANopen assumes that the hardware of the connected device has a CAN transceiver that conforms to ISO11898 standard and a CAN controller. CANopen is developed on the basis of CAL, and uses a subset of CAL communication and service protocols to provide an implementation solution for a distributed control system. CANopen guarantees the interoperability of network nodes while allowing the functions of nodes to be expanded at will: simple or complex. The core concept of CANopen is the device object dictionary (OD), which is also used in other fieldbus (Profibus, Interbus-S) systems. CANopen communication can access all the parameters of the drive through the object dictionary (OD).

Note: The object dictionary is not part of CAL, but is implemented in CANopen.

The CANopen communication model defines the following types of messages (communication objects).

| <b>Abbreviation</b> | <b>Full Name</b>        | <b>Function</b>   |
|---------------------|-------------------------|---|
| <b>SDO</b>          | Service Data Object     | Used for non-time critical data, such as parameters   |
| <b>PDO</b>          | Process Data Object     | Used to transmit time critical process data (given value, control word, status information, etc.) |
| <b>SYNC</b>         | Synchronization Message | Used to synchronize CAN nodes   |
| <b>EMCY</b>         | Emergency Message       | Used to transmit the alarm events of the driver   |
| <b>NMT</b>          | Network Management      | Used for CANopen network management   |
| <b>Heartbeat</b>    | Error Control Protocol  | Used for monitoring the life status of all nodes  |

## 4. Communication Method

The CAN protocol used by N83624 is CANopen protocol. Before using N83624, please connect CAN interface and configure CAN interface parameters. For example, address is set to 01. Please refer to the user manual for details. The remote control process of N83624 battery simulator through CAN is as follows.

1. Factory default CAN ID: 0601-0618 (adjustable, 0x0600+CAN address)
2. CAN baud rate setting range: 250K
3. PC sends a startup message to the device.
4. After the device receives the startup message, it enters the remote control mode of CAN. At this time, the front panel of the device shows that it is entering the Rmt state). Only by entering CAN remote control mode, the device can send and receive data from the PC.
5. The device starts to send the parameters associated with TPDO to the PC via CAN at regular intervals.
6. The PC can also send RPTO or SDO messages over CAN to configure the relevant parameters of the device.
7. If it is necessary to quit the physical CAN communication state, the PC can send a stop message. At this time the device front panel reverts to the local state. In the following chapters specific interactive and setup messages will be described in detail.

## 5. CAN Format

Different CAN analysis tools display different requirements and fields. The actual tool shall prevail. The following explains the meaning of some fields in different tools for reference during use.

In conventional tools, users need to pay attention to the frame ID and frame data when sending CAN commands.

For example, sending a heartbeat setting command.

| Frame ID | Frame Data              | Remark                               |
|----------|-------------------------|--------------------------------------|
| 0601     | 2b 17 10 00 e8 03 00 00 | Setting the heartbeat time to 1000ms |

The calculation method of frame ID is 0x600+CAN address. In this manual, CAN address is 01 as an example. 0x600 is the fixed address of N83624.

Frame data: Different functions correspond to different commands and different

parameter values. Please refer to the command introduction in the subsequent chapters.

Example frame description:

**2b**: CS (command specifier), which means to write two bytes. The command specifier description is as follows.

40h=Read

2Bh=Write two bytes

4Bh=Read response two bytes

2Fh=Write one byte

4Fh=Read response one byte

27h=Write three bytes

47h=Read response three bytes

23h=Write four bytes

43h=Read response four bytes

60h=Write successful response

80h=Abnormal response

**17 10**: Main index 0x1017

**00**: Sub index 0x00

**e8 03**: data 0x03e8

## 6. Commands

### 6.1. Basic Command

#### 6.1.1. Status Register

Reading command: 43 00 30 01 00 00 00 00

Format

| Main Index | Sub Index | Read/Write | Data Type | Byte Size |
|------------|-----------|------------|-----------|-----------|
| 0x3000     | 0x01      | OR         | int       | 4         |

Parameter description:

Bit0: onoff Bit1:

ovp Bit2: ocp Bit3

: opp Bit4: otp

Bit5: ofp(Voltage and current are present at the port when operating the fault simulation relay);

Bit6: omp(Operation of the fault simulation relay is only allowed in power mode, other modes are not supported);

Bit16-18: Echo real time range (0 large range, 1 medium range, 2 low range).

#### 6.1.2. Event Register

Reading command: 43 00 30 02 00 00 00 00

Format

| Main Index | Sub Index | Read/Write | Data Type | Byte Size |
|------------|-----------|------------|-----------|-----------|
| 0x3000     | 0x02      | OR         | int       | 4         |

Parameter description:

Bit0: onoff Bit1

: ovp Bit2:

ocp Bit3: opp

Bit4: otp

Bit5: ofp(Voltage and current are present at the port when operating the fault simulation relay);

Bit6: omp(Operation of the fault simulation relay is only allowed in power mode, other modes are not supported);

Bit16-18: Echo real time range (0 large range, 1 medium range, 2 low range).



### 6.1.3. Readback Voltage

Reading command: 43 00 30 03 00 00 00 00

Format

| Main Index | Sub Index | Read/Write | Data Type | Byte Size |
|------------|-----------|------------|-----------|-----------|
| 0x3000     | 0x03      | OR         | int       | 4         |

Parameter description: reading present voltage of battery simulator, unit mV

Returning data: 43 00 30 03 12 D8 00 00

The red part is voltage data. Hexadecimal 0x0000D812, converting to decimal, is 55314mV, that is, 55.314V.

### 6.1.4. Readback Current

Reading command: 43 00 30 04 00 00 00 00

Format

| Main Index | Sub Index | Read/Write | Data Type | Byte Size |
|------------|-----------|------------|-----------|-----------|
| 0x3000     | 0x04      | OR         | int       | 4         |

Parameter description: reading present current of battery simulator, unit mA

Returning data: 43 00 30 04 12 D8 00 00

The red part is current data. Hexadecimal 0x0000D812, converting to decimal, is 55314 mA, that is, 55.314A.

### 6.1.5. Readback Power

Reading command: 43 00 30 05 00 00 00 00

Format

| Main Index | Sub Index | Read/Write | Data Type | Byte Size |
|------------|-----------|------------|-----------|-----------|
| 0x3000     | 0x05      | OR         | int       | 4         |

Parameter description: reading present power of battery simulator, unit mW

Returning data: 43 00 30 05 12 D8 00 00

The red part is power data. Hexadecimal 0x0000D812, converting to decimal, is 55314mW, that is, 55.314W.

### 6.1.6. Circuit Equivalent Resistance

Reading command: 43 00 30 06 00 00 00 00

Format

| Main Index | Sub Index | Read/Write | Data Type | Byte Size |
|------------|-----------|------------|-----------|-----------|
| 0x3000     | 0x06      | OR         | int       | 4         |

Parameter description: Query the real-time resistance value of the battery simulator in 0.001mΩ.

Returning data: 43 00 30 06 12 D8 00 00

The red part is resistance data. Hexadecimal 0x0000D812, converting to decimal, is 55314, that is, 55.314mΩ.

### 6.1.7. Capacity

Reading command: 43 00 30 07 00 00 00 00

Format

| Main Index | Sub Index | Read/Write | Data Type | Byte Size |
|------------|-----------|------------|-----------|-----------|
| 0x3000     | 0x07      | OR         | int       | 4         |

Parameter description: Query the real-time resistance value of the battery simulator in 0.001mΩ.

Returning data: 43 00 30 07 12 D8 00 00

The red part is resistance data. Hexadecimal 0x0000D812, converting to decimal, is 55314, that is, 55.314mAh.

### 6.1.8. Temperature

Reading command: 43 00 30 08 00 00 00 00

Format

| Main Index | Sub Index | Read/Write | Data Type | Byte Size |
|------------|-----------|------------|-----------|-----------|
| 0x3000     | 0x08      | OR         | int       | 4         |

Parameter description: reading present temperature of battery simulator, unit 0.001 °C

### 6.1.9. ON/OFF Switch

Reading command: 43 00 30 09 00 00 00 00

Setting command: 23 00 30 09 00 00 00 00

Format

| Main Index | Sub Index | Read/Write | Data Type | Byte Size |
|------------|-----------|------------|-----------|-----------|
| 0x3000     | 0x09      | WR         | int       | 4         |

Parameter description: 0-OFF; 1-ON

### 6.1.10. Factory Reset

Setting command: 23 00 30 0E 00 00 00 00

Format

| Main Index | Sub Index | Read/Write | Data Type | Byte Size |
|------------|-----------|------------|-----------|-----------|
| 0x3000     | 0x0E      | W          | int       | 4         |

Parameter description: 0-OFF; 1-ON

Executing the Restore Factory Settings command resets the following parameters of the device:

1. Reset the values of voltage and output current limit to 0 in power mode;
2. Reset the values of voltage, current and internal resistance to 0 under charging mode;
3. Reset the file under SOC editing to the built-in default file;
4. Reset the protection setting (over-voltage, over-current, over-power protection, etc.) to 0;
5. clear all the sequence running files, sequence file allocation step is 0;
6. Reset CANID to channel ID, baud rate to 250K, and active upload time to 0.
7. Reset the device IP to 192.168.0.123, device ID to 1, serial port rate to 115200, sampling speed to medium speed, the power-down save is turned off.

Note: It takes about 10S to restore the factory settings.

### 6.1.11. Delay ON

Reading command: 43 00 30 0F 00 00 00 00

Setting command: 23 00 30 0F A8 61 00 00

Format

| Main Index | Sub Index | Read/Write | Data Type | Byte Size |
|------------|-----------|------------|-----------|-----------|
| 0x3000     | 0x0F      | WR         | int       | 4         |

Parameter description: unit: us

## 6.2. Static Command

### 6.2.1. Function Mode

Reading command: 43 00 30 0A 00 00 00 00

Setting command: 23 00 30 0A 00 00 00 00

Format

| Main Index | Sub Index | Read/Write | Data Type | Byte Size |
|------------|-----------|------------|-----------|-----------|
| 0x3000     | 0x0A      | WR         | int       | 4         |

Parameter description:

- 0: CVCR mode
- 1: battery charge simulation mode
- 3: SOC test mode
- 128: SEQ test

### 6.2.2. Source Mode

Reading command: 43 00 30 0A 00 00 00 00

Setting command: 23 00 30 0A 00 00 00 00

Format

| Main Index | Sub Index | Read/Write | Data Type | Byte Size |
|------------|-----------|------------|-----------|-----------|
| 0x3000     | 0x0A      | WR         | int       | 4         |

Parameter description:

- 0: CVCR mode
- 1: battery charge simulation mode
- 3: SOC test mode
- 128: SEQ test

### 6.2.2.1. Constant Voltage Value

Reading command: 43 00 30 0C 00 00 00 00

Setting command: 23 00 30 0C 00 00 00 00

Format

| Main Index | Sub Index | Read/Write | Data Type | Byte Size |
|------------|-----------|------------|-----------|-----------|
| 0x3000     | 0x0C      | WR         | int       | 4         |

Parameter description: unit mV

### 6.2.2.2. Output Current Limit

Reading command: 43 00 30 0D 00 00 00 00

Setting command: 23 00 30 0D 00 00 00 00

Format

| Main Index | Sub Index | Read/Write | Data Type | Byte Size |
|------------|-----------|------------|-----------|-----------|
| 0x3000     | 0x0D      | WR         | int       | 4         |

Parameter description:

After setting this parameter, the output current will not exceed this value. The unit is mA, that is, setting 1000 means 1mA.

### 6.2.2.3. Current Range

Reading command: 43 00 30 0B 00 00 00 00

Setting command: 23 00 30 0B 00 00 00 00

Format

| Main Index | Sub Index | Read/Write | Data Type | Byte Size |
|------------|-----------|------------|-----------|-----------|
| 0x3000     | 0x0B      | WR         | int       | 4         |

Parameter description:

- 0: high range
- 2: low range
- 3: auto range

## 6.2.3. Charge Mode

### 6.2.3.1. Constant Voltage Value

Reading command: 43 01 30 00 00 00 00 00

Setting command: 23 01 30 00 DC 05 00 00

Format

| Main Index | Sub Index | Read/Write | Data Type | Byte Size |
|------------|-----------|------------|-----------|-----------|
| 0x3001     | 0x00      | WR         | int       | 4         |

Parameter description:

The unit is mV. 0x000005DC means 1500mV.

### 6.2.3.2. Simulated Resistance

Reading command: 43 01 30 02 00 00 00 00

Setting command: 23 01 30 02 DC 05 00 00

Format

| Main Index | Sub Index | Read/Write | Data Type | Byte Size |
|------------|-----------|------------|-----------|-----------|
| 0x3001     | 0x02      | WR         | int       | 4         |

Parameter description: unit mΩ

0x000005DC indicates 1500, that is 1.5mΩ

### 6.2.3.3. Echo Voltage

Reading command: 43 01 30 03 00 00 00 00

Format

| Main Index | Sub Index | Read/Write | Data Type | Byte Size |
|------------|-----------|------------|-----------|-----------|
| 0x3001     | 0x03      | OR         | int       | 4         |

Parameter description:

The unit is mV.

## 6.2.4. SOC Edit

### 6.2.4.1. File No

Reading command: 43 02 30 0A 00 00 00 00

Setting command: 23 02 30 0A 03 00 00 00

Format

| Main Index | Sub Index | Read/Write | Data Type | Byte Size |
|------------|-----------|------------|-----------|-----------|
| 0x3002     | 0x0A      | WR         | int       | 4         |

Parameter description: range:1-8

#### 6.2.4.2. Total Steps

Reading command: 43 02 30 00 00 00 00 00

Setting command: 23 02 30 00 03 00 00 00

Format

| Main Index | Sub Index | Read/Write | Data Type | Byte Size |
|------------|-----------|------------|-----------|-----------|
| 0x3002     | 0x00      | WR         | int       | 4         |

Parameter description: range:0-200

#### 6.2.4.3. Step No.

Reading command: 43 02 30 02 00 00 00 00

Setting command: 23 02 30 02 01 00 00 00

Format

| Main Index | Sub Index | Read/Write | Data Type | Byte Size |
|------------|-----------|------------|-----------|-----------|
| 0x3002     | 0x02      | WR         | int       | 4         |

Parameter description: range:1-200

#### 6.2.4.4. Capacity

Reading command: 43 02 30 03 00 00 00 00

Setting command: 23 02 30 03 DC 05 00 00

Format

| Main Index | Sub Index | Read/Write | Data Type | Byte Size |
|------------|-----------|------------|-----------|-----------|
| 0x3002     | 0x03      | WR         | int       | 4         |

Parameter description: unit mAh

#### 6.2.4.5. Constant Voltage Value

Reading command: 43 02 30 04 00 00 00 00

Setting command: 23 02 30 04 DC 05 00 00

Format

| Main Index | Sub Index | Read/Write | Data Type | Byte Size |
|------------|-----------|------------|-----------|-----------|
| 0x3002     | 0x04      | WR         | int       | 4         |

Parameter description: unit mV

#### 6.2.4.6. Simulated Internal Resistance

Reading command: 43 02 30 05 00 00 00 00

Setting command: 23 02 30 05 DC 05 00 00

Format

| Main Index | Sub Index | Read/Write | Data Type | Byte Size |
|------------|-----------|------------|-----------|-----------|
| 0x3002     | 0x05      | WR         | int       | 4         |

Parameter description: unit mΩ

#### 6.2.4.7. Output Current Limit

Reading command: 43 02 30 08 00 00 00 00

Setting command: 23 02 30 08 40 42 0F 00

Format

| Main Index | Sub Index | Read/Write | Data Type | Byte Size |
|------------|-----------|------------|-----------|-----------|
| 0x3002     | 0x08      | WR         | int       | 4         |

Parameter description: The unit is mA. 0x000F4240 means 1000000, that is 1000mA.

### 6.2.5. SOC Test

#### 6.2.5.1. Initial Voltage

Reading command: 43 02 30 09 00 00 00 00

Setting command: 23 02 30 09 DC 05 00 00

Format

| Main Index | Sub Index | Read/Write | Data Type | Byte Size |
|------------|-----------|------------|-----------|-----------|
| 0x3002     | 0x09      | WR         | int       | 4         |

Parameter description: unit mV

#### 6.2.5.2. Initial Capacity

Reading command: 43 02 30 01 00 00 00 00

Format

| Main Index | Sub Index | Read/Write | Data Type | Byte Size |
|------------|-----------|------------|-----------|-----------|
| 0x3002     | 0x01      | OR         | int       | 4         |



Parameter description: unit mAh

### 6.2.5.3. Present Step

Reading command: 43 02 30 06 00 00 00 00

Format

| Main Index | Sub Index | Read/Write | Data Type | Byte Size |
|------------|-----------|------------|-----------|-----------|
| 0x3002     | 0x06      | OR         | int       | 4         |

Parameter description: reading the present running step No.

### 6.2.5.4. Present Capacity

Reading command: 43 02 30 07 00 00 00 00

Format

| Main Index | Sub Index | Read/Write | Data Type | Byte Size |
|------------|-----------|------------|-----------|-----------|
| 0x3002     | 0x07      | OR         | int       | 4         |

Parameter description: unit mAh

### 6.2.5.5. Open Circuit Voltage

Reading command: 43 02 30 0B 00 00 00 00

Format

| Main Index | Sub Index | Read/Write | Data Type | Byte Size |
|------------|-----------|------------|-----------|-----------|
| 0x3002     | 0x0B      | OR         | int       | 4         |

Parameter description: unit V

### 6.2.5.6. Resistance Value

Reading command: 43 02 30 0C 00 00 00 00

Format

| Main Index | Sub Index | Read/Write | Data Type | Byte Size |
|------------|-----------|------------|-----------|-----------|
| 0x3002     | 0x0C      | OR         | int       | 4         |

Parameter description: unit mΩ

## 6.2.6. SEQ Edit

### 6.2.6.1. SEQ File No.

Reading command: 43 03 30 00 00 00 00 00

Setting command: 23 03 30 00 01 00 00 00

Format

| Main Index | Sub Index | Read/Write | Data Type | Byte Size |
|------------|-----------|------------|-----------|-----------|
| 0x3003     | 0x00      | WR         | int       | 4         |

Parameter description: range:1-10

### 6.2.6.2. Total Steps

Reading command: 43 03 30 03 00 00 00 00

Setting command: 23 03 30 03 03 00 00 00

Format

| Main Index | Sub Index | Read/Write | Data Type | Byte Size |
|------------|-----------|------------|-----------|-----------|
| 0x3003     | 0x03      | WR         | int       | 4         |

Parameter description: range:0-200

### 6.2.6.3. File Cycle Times

Reading command: 43 03 30 04 00 00 00 00

Setting command: 23 03 30 04 01 00 00 00

Format

| Main Index | Sub Index | Read/Write | Data Type | Byte Size |
|------------|-----------|------------|-----------|-----------|
| 0x3003     | 0x04      | WR         | int       | 4         |

Parameter description: range:0-100

### 6.2.6.4. Step No.

Reading command: 43 03 30 05 00 00 00 00

Setting command: 23 03 30 05 01 00 00 00

Format

| Main Index | Sub Index | Read/Write | Data Type | Byte Size |
|------------|-----------|------------|-----------|-----------|
|------------|-----------|------------|-----------|-----------|

|        |      |    |     |   |
|--------|------|----|-----|---|
| 0x3003 | 0x05 | WR | int | 4 |
|--------|------|----|-----|---|

Parameter description: range:1-200

#### 6.2.6.5. Constant Voltage Value

Reading command: 43 03 30 06 00 00 00 00

Setting command: 23 03 30 06 DC 05 00 00

Format

| Main Index | Sub Index | Read/Write | Data Type | Byte Size |
|------------|-----------|------------|-----------|-----------|
| 0x3003     | 0x06      | WR         | int       | 4         |

Parameter description: unit mV

#### 6.2.6.6. Output Current Limit

Reading command: 43 03 30 07 00 00 00 00

Setting command: 23 03 30 07 40 42 0F 00

Format

| Main Index | Sub Index | Read/Write | Data Type | Byte Size |
|------------|-----------|------------|-----------|-----------|
| 0x3003     | 0x07      | WR         | int       | 4         |

Parameter description: The unit is mA. 0x000F4240 means 1000000, that is 1000mA.

#### 6.2.6.7. Simulated Internal Resistance

Reading command: 43 03 30 08 00 00 00 00

Setting command: 23 03 30 08 DC 05 00 00

Format

| Main Index | Sub Index | Read/Write | Data Type | Byte Size |
|------------|-----------|------------|-----------|-----------|
| 0x3003     | 0x08      | WR         | int       | 4         |

Parameter description: The unit is mΩ.

#### 6.2.6.8. Dwell

Reading command: 43 03 30 09 00 00 00 00

Setting command: 23 03 30 09 40 42 0F 00

Format

| Main Index | Sub Index | Read/Write | Data Type | Byte Size |
|------------|-----------|------------|-----------|-----------|
| 0x3003     | 0x09      | WR         | int       | 4         |

Parameter description: The unit is ms.

#### 6.2.6.9. Link Start Step No.

Reading command: 43 03 30 0A 00 00 00 00

Setting command: 23 03 30 0A 00 05 00 00

Format

| Main Index | Sub Index | Read/Write | Data Type | Byte Size |
|------------|-----------|------------|-----------|-----------|
| 0x3003     | 0x0A      | WR         | int       | 4         |

Parameter description: -1 means invalid.

#### 6.2.6.10. Link Stop Step No.

Reading command: 43 03 30 0B 00 00 00 00

Setting command: 23 03 30 0B 00 05 00 00

Format

| Main Index | Sub Index | Read/Write | Data Type | Byte Size |
|------------|-----------|------------|-----------|-----------|
| 0x3003     | 0x0B      | WR         | int       | 4         |

Parameter description: -1 means invalid.

#### 6.2.6.11. Link Cycle Times

Reading command: 43 03 30 0C 00 00 00 00

Setting command: 23 03 30 0C 00 05 00 00

Format

| Main Index | Sub Index | Read/Write | Data Type | Byte Size |
|------------|-----------|------------|-----------|-----------|
| 0x3003     | 0x0C      | WR         | int       | 4         |

Parameter description: range:0-100

## 6.2.7. SEQ Test

### 6.2.7.1. SEQ File No.

Reading command: 43 03 30 01 00 00 00 00

Setting command: 23 03 30 01 01 00 00 00

Format

| Main Index | Sub Index | Read/Write | Data Type | Byte Size |
|------------|-----------|------------|-----------|-----------|
| 0x3003     | 0x01      | WR         | int       | 4         |

Parameter description: range:1-10

### 6.2.7.2. Step No.

Reading command: 43 03 30 02 00 00 00 00

Format

| Main Index | Sub Index | Read/Write | Data Type | Byte Size |
|------------|-----------|------------|-----------|-----------|
| 0x3003     | 0x02      | OR         | int       | 4         |

Parameter description: range:1-200

### 6.2.7.3. Dwell

Reading command: 43 03 30 0D 00 00 00 00

Format

| Main Index | Sub Index | Read/Write | Data Type | Byte Size |
|------------|-----------|------------|-----------|-----------|
| 0x3003     | 0x0D      | OR         | int       | 4         |

Parameter description: The unit is ms.

### 6.2.7.4. Present File Cycle Times

Reading command: 43 03 30 0E 00 00 00 00

Format

| Main Index | Sub Index | Read/Write | Data Type | Byte Size |
|------------|-----------|------------|-----------|-----------|
| 0x3003     | 0x0E      | OR         | int       | 4         |

## 6.2.8. Protection

### 6.2.8.1. OCP

Reading command: 43 05 30 00 00 00 00 00

Setting command: 23 05 30 00 DC 05 00 00

Format

| Main Index | Sub Index | Read/Write | Data Type | Byte Size |
|------------|-----------|------------|-----------|-----------|
| 0x3005     | 0x00      | WR         | int       | 4         |

Parameter description: unit mA

### 6.2.8.2. OVP

Reading command: 43 05 30 01 00 00 00 00

Setting command: 23 05 30 01 DC 05 00 00

Format

| Main Index | Sub Index | Read/Write | Data Type | Byte Size |
|------------|-----------|------------|-----------|-----------|
| 0x3005     | 0x01      | WR         | int       | 4         |

Parameter description: unit mV

### 6.2.8.3. OPP

Reading command: 43 05 30 02 00 00 00 00

Setting command: 23 05 30 02 DC 05 00 00

Format

| Main Index | Sub Index | Read/Write | Data Type | Byte Size |
|------------|-----------|------------|-----------|-----------|
| 0x3005     | 0x02      | WR         | int       | 4         |

Parameter description: unit mW

## 6.2.9. CAN Setting

### 6.2.9.1. Sense Speed

Reading command: 43 04 30 00 00 00 00 00

Format

| Main Index | Sub Index | Read/Write | Data Type | Byte Size |
|------------|-----------|------------|-----------|-----------|
| 0x3004     | 0x00      | RO         | int       | 4         |

Parameter description: 0-10ms, 1-120ms, 2-480ms

### 6.2.9.2. CAN ID

Reading command: 43 04 30 01 00 00 00 00

Setting command: 23 04 30 01 00 00 00 00

Format

| Main Index | Sub Index | Read/Write | Data Type | Byte Size |
|------------|-----------|------------|-----------|-----------|
| 0x3004     | 0x01      | OR         | int       | 4         |

Parameter description: channels ID: 1-24

Note: When changing CAN settings, users need to turn on power-off memory first, and then reboot the device.

### 6.2.9.3. CAN Active Upload Time

Reading command: 43 04 30 02 00 00 00 00

Setting command: 23 04 30 02 DC 05 00 00

Format

| Main Index | Sub Index | Read/Write | Data Type | Byte Size |
|------------|-----------|------------|-----------|-----------|
| 0x3004     | 0x02      | WR         | int       | 4         |

Parameter description: 0-OFF, Minimum time interval > 60ms in ms.

### 6.2.9.4. CAN Baud Rate

Reading command: 43 04 30 03 00 00 00 00

Format

| Main Index | Sub Index | Read/Write | Data Type | Byte Size |
|------------|-----------|------------|-----------|-----------|
| 0x3004     | 0x03      | WR         | int       | 4         |

Parameter description: 250K default.

### 6.2.9.5. CAN Extension Frame ID

Reading command: 43 04 30 04 00 00 00 00

Setting command: 23 04 30 04 00 00 00 00

Format

| Main Index | Sub Index | Read/Write | Data Type | Byte Size |
|------------|-----------|------------|-----------|-----------|
| 0x3004     | 0x04      | OR         | int       | 4         |

Parameter description: channels ID: 1-24

## 6.2.10. Fault Simulation(Optional)

Reading command: 43 06 30 00 00 00 00 00

Setting command: 23 06 30 00 01 00 00 00

Format

| Main Index | Sub Index | Read/Write | Data Type | Byte Size |
|------------|-----------|------------|-----------|-----------|
| 0x3006     | 0x00      | WR         | int       | 4         |

Parameter description:

0 for normal output

1 for positive open-circuit

4 for negative open-circuit

8 for positive and negative short-circuit

96 for positive and negative polarity reverse

Note: Before writing this register, please set this register to zero first and then set the required value.

## 6.2.11. System Setting

### 6.2.11.1. Baud Rate

Reading command: 43 06 30 01 00 00 00 00

Setting command: 23 06 30 01 01 C2 01 00

Format

| Main Index | Sub Index | Read/Write | Data Type | Byte Size |
|------------|-----------|------------|-----------|-----------|
| 0x3006     | 0x01      | WR         | int       | 4         |

Parameter description: 0x01C200 is converted to decimal 115200, which means the baud rate is set to 115200.

Note: Only effective for channel 1 writing, before modification, users need to turn on channel 1 power-off memory.

### 6.2.11.2. Beeper

Reading command: 43 06 30 02 00 00 00 00

Setting command: 23 06 30 02 01 00 00 00

Format



| Main Index | Sub Index | Read/Write | Data Type | Byte Size |
|------------|-----------|------------|-----------|-----------|
| 0x3006     | 0x02      | WR         | int       | 4         |

Parameter description: 0-OFF, 1-ON

Note: Only effective for channel 1 writing, before modification, users need to turn on channel 1 power-off memory.

### 6.2.11.3. Language

Reading command: 43 06 30 03 00 00 00 00

Setting command: 23 06 30 03 01 00 00 00

Format

| Main Index | Sub Index | Read/Write | Data Type | Byte Size |
|------------|-----------|------------|-----------|-----------|
| 0x3006     | 0x03      | WR         | int       | 4         |

Parameter description: 0-Chinese, 1-English

Note: Only effective for channel 1 writing, before modification, users need to turn on channel 1 power-off memory.

### 6.2.11.4. Power-off Memory

Reading command: 43 06 30 04 00 00 00 00

Setting command: 23 06 30 04 01 00 00 00

Format

| Main Index | Sub Index | Read/Write | Data Type | Byte Size |
|------------|-----------|------------|-----------|-----------|
| 0x3006     | 0x04      | WR         | int       | 4         |

Parameter description: 0-OFF, 1-ON

### 6.2.11.5. IP Setting

Reading command: 43 06 30 05 00 00 00 00

Setting command: 23 06 30 05 C0 A8 00 7B

Format

| Main Index | Sub Index | Read/Write | Data Type | Byte Size |
|------------|-----------|------------|-----------|-----------|
| 0x3006     | 0x05      | WR         | int       | 4         |

Parameter description: Dot decimal representation: such as IP is 192.168.0.123, converted to hexadecimal is: C0 A8 00 7B; then set or read the data is: C0 A8 00 7B

Note: Only effective for channel 1 writing, before modification, users need to turn on channel 1 power-off memory.

### 6.2.11.6. Network Connection

Reading command: 43 06 30 07 00 00 00 00

Setting command: 23 06 30 07 00 00 00 00

Format

| <b>Main Index</b> | <b>Sub Index</b> | <b>Read/Write</b> | <b>Data Type</b> | <b>Byte Size</b> |
|-------------------|------------------|-------------------|------------------|------------------|
| 0x3006            | 0x07             | WR                | int              | 4                |

Parameter description: 0-UDP; 1-TCP

Note: Only effective for channel 1 writing, before modification, users need to turn on channel 1 power-off memory.