Oriental motor

Data Setter **OPX-2A**
CRK Series FLEX
Built-in Controller Type

OPERATING MANUAL

Table of contents

Thank you for purchasing an Oriental Motor product.
This Manual describes product handling procedures and safety precautions.

• Please read it thoroughly to ensure safe operation.

• Always keep the manual where it is readily available.

1   Safety precautions

The precautions described below are intended to prevent danger or injury to the user and other personnel through safe, correct use of the product. Use the product only after carefully reading and fully understanding these instructions.
Also read the "Safety precautions" sections in the operating manuals that came with the product you are combining with the **OPX-2A**.

⚠WARNING	Handling the product without observing the instructions that accompany a "Warning" symbol may result in serious injury or death.
⚠CAUTION	Handling the product without observing the instructions that accompany a "Caution" symbol may result in injury or property damage.
Note	The items under this heading contain important handling instructions that the user should observe to ensure safe use of the product.

⚠WARNING

General

- Do not use the product in explosive or corrosive environments, in the presence of flammable gases, locations subjected to splashing water, or near combustibles. Doing so may result in fire, electric shock or injury.
- Assign qualified personnel the task of installing, wiring, operating/controlling, inspecting and troubleshooting the product. Failure to do so may result in fire, electric shock or injury.
- When the driver's protection function is triggered, first remove the cause and then clear the protection function. Continuing the operation without removing the cause of the problem may cause malfunction of the motor and driver, leading to injury or damage to equipment.

Repair, disassembly and modification

- Do not disassemble or modify the data setter. This may cause electric shock or injury. Refer all such internal inspections and repairs to the branch or sales office from which you purchased the product.

⚠CAUTION

General

- Do not use the motor and driver beyond their specifications, or electric shock, injury or damage to equipment may result.

Operation

- Provide an emergency stop device or emergency stop circuit external to the equipment so that the entire equipment will operate safely in the event of a system failure or malfunction. Failure to do so may result in injury.

Disposal

- Dispose the product correctly in accordance with laws and regulations, or instructions of local governments.

2   Introduction

Only qualified personnel of electrical and mechanical engineering should work with the product.
Use the product correctly after thoroughly reading the "1 Safety precautions" on p.2. In addition, be sure to observe the contents described in warning, caution, and note in this manual.
The product described in this manual has been designed and manufactured to be incorporated in general industrial equipment. Do not use for any other purpose. Oriental Motor Co., Ltd. is not responsible for any damage caused through failure to observe this warning.

■ Overview of the product

The **OPX-2A** is a data setter that lets you set operating data and parameters, perform monitoring, etc.
So that the **OPX-2A** is used correctly and safely, thoroughly read the "**CRK** Series FLEX Built-in Controller type USER MANUAL" and understand the basic operating procedures and other details of the driver.

■ Features of OPX-2A

The **OPX-2A** can be used to save data in addition to setting of operation data and parameters.
There are four destinations (data banks) to save data.
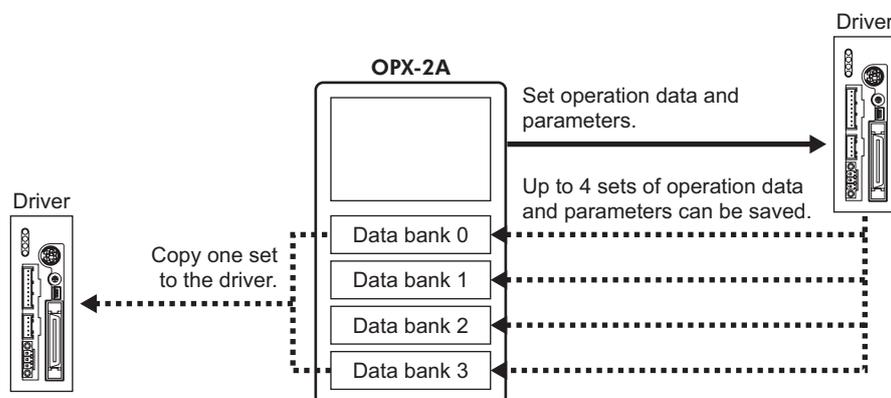
The **OPX-2A** can be used for the following purposes:
- Set driver operation data and parameters
- Monitor the operating status of the motor
- The data and parameters set in the driver can be saved to the **OPX-2A**.
- The data and parameters saved in the **OPX-2A** can be copied to another driver connected to the **OPX-2A**.

■ Specifications

Connection	Mini DIN, 8 pins
External dimensions	96 (W) × 72 (H) × 21.5 (D) mm [3.78 (W) × 2.83 (H) × 0.85 (D) in.]
Cable length	5 m (16.4 ft.)
Mass	0.25 kg (8.8 oz)

■ RoHS Directive

The products do not contain the substances exceeding the restriction values of RoHS Directive (2011/65/EU).
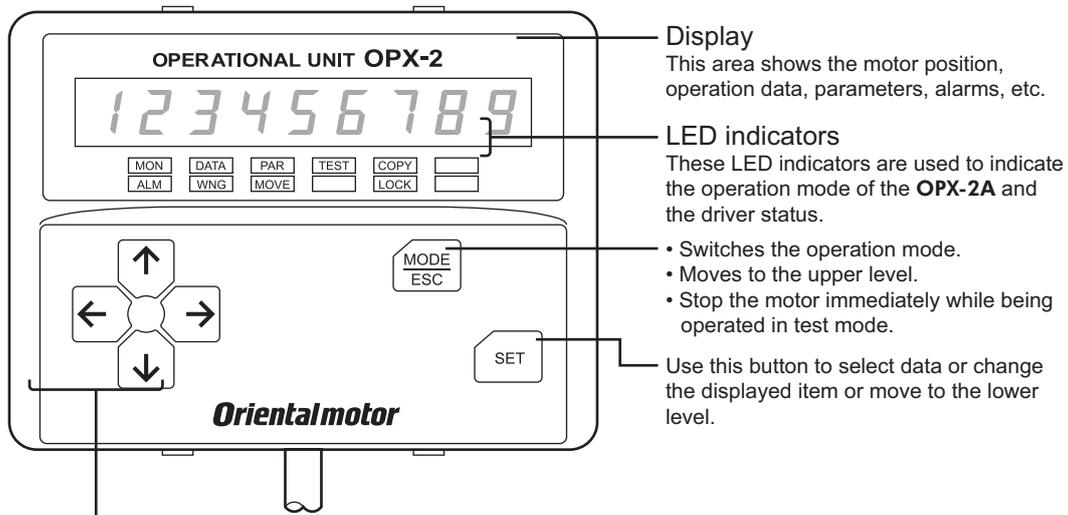
3 Preparation

This chapter explains the items you should know before using the **OPX-2A**.

3-1 Checking the product

Verify that the items listed below are included. Report any missing or damaged items to the branch or sales office from which you purchased the product.

- Data setter **OPX-2A**.....................................1 unit
- Information...1 copy

3-2 Names and functions of parts

Display
This area shows the motor position, operation data, parameters, alarms, etc.

LED indicators
These LED indicators are used to indicate the operation mode of the **OPX-2A** and the driver status.

- Switches the operation mode.
- Moves to the upper level.
- Stop the motor immediately while being operated in test mode.

Use this button to select data or change the displayed item or move to the lower level.

Use these buttons to change the selected item or set data and parameters.

Use these buttons to increase or decrease the value or change the selected item.

Use these buttons to navigate through each data or parameter to a desired digit.

■ **Notation**

In this manual, keys are denoted by symbols, such as 【MODE/ESC】【SET】【↑】【↓】【←】【→】.
In figures, a simplified illustration of the display and LED indicators is used, as shown below.
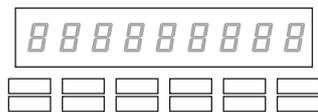
3-3 How to read the display

The display consists of 7-segment LEDs. (The number "5" and alphabet "S" are the same.)

- Numbers

1	2	3	4	5	6	7	8	9	0

- Alphabets

A	B	C	D	E	F	G	H	I	J	K	L
M	N	O	P	Q	R	S	T	U	V	W	Y

- Signes

+	–

3-4 How to read the LED indicators

When the operation mode is changed or an alarm or warning generates, a corresponding LED will be lit. While the motor is operating or the edit lock function is enabled, the condition is also indicated by the illumination of a corresponding LED.
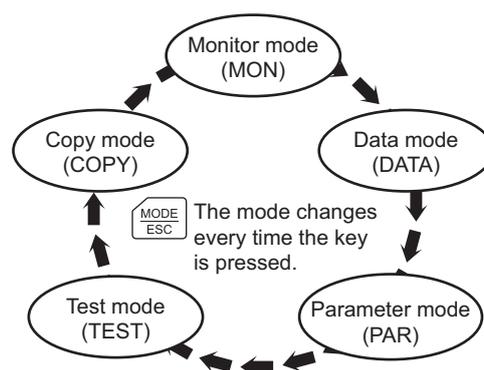

Lit in the parameter mode
Lit in the data mode
Lit in the monitor mode

Lit in the test mode
Lit in the copy mode
Not used

MON	DATA	PAR	TEST	COPY	
ALM	WNG	MOVE		LOCK	

Lit when an alarm is present
Lit when a warning is present
Lit while the motor is operating

Not used
Lit when the edit lock function is enabled
Not used
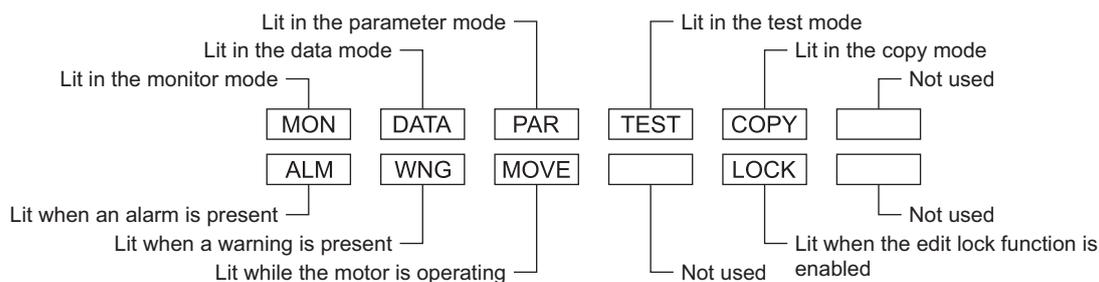
3-5 Types of operation modes

The **OPX-2A** has multiple operation modes. The operation mode will change every time the 【$\frac{MODE}{ESC}$】 key is pressed. The display starts in the monitor mode when the power is turned on.
When the operation mode is changed, the LED indicator corresponding to the previous mode will turn off and the one corresponding to the new mode will be lit. Identify the current operation mode based on the LED indicator currently lit.


Monitor mode (MON)
Copy mode (COPY)
Data mode (DATA)
$\frac{MODE}{ESC}$ The mode changes every time the key is pressed.
Test mode (TEST)
Parameter mode (PAR)

3-6   Basic operations of the OPX-2A

Use the six keys【$\frac{MODE}{ESC}$】【SET】【↑】【↓】【←】【→】to set data and operate the motor.

■ Operation flow

The **OPX-2A** is operated according to the flow shown below.

Level 1: Top screen in each mode   Level 2: Item selection screen   Level 3
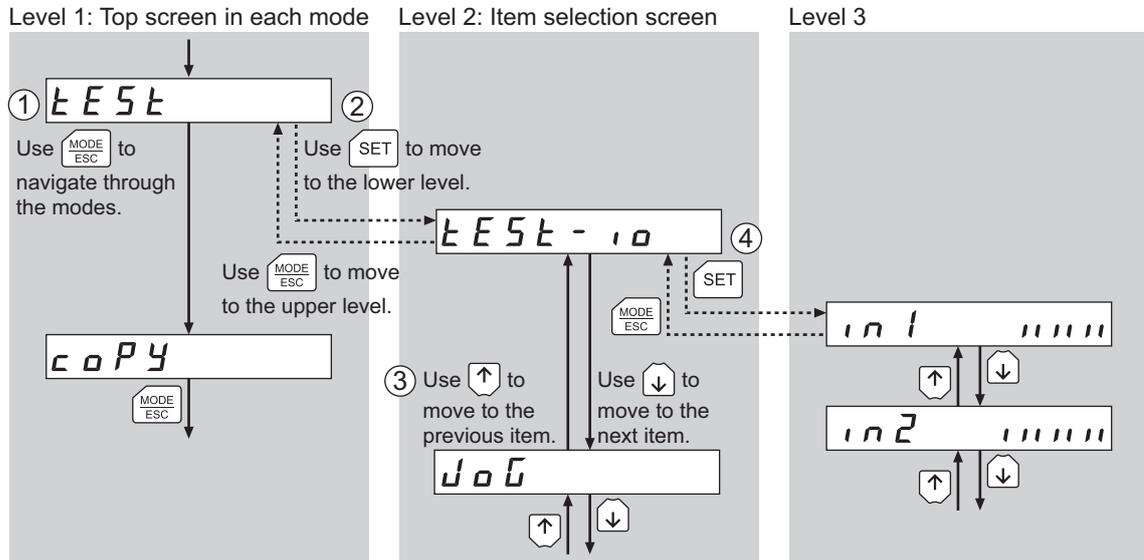
1. Use the【$\frac{MODE}{ESC}$】key to select a desired operation mode appropriate for your intended operation.
   Example: If you want to use a function in the test mode, press the【$\frac{MODE}{ESC}$】key to select the test mode (indicated by a lit "TEST" LED). The top screen of the test mode is displayed.

2. Press the【SET】key to move to the lower level.

3. Use the【↑】【↓】keys to select a desired item.

4. To move to the lower level, press the【SET】key. To return to the previous level, press the【$\frac{MODE}{ESC}$】key.

As explained above, use the【SET】key to navigate through the levels and use the【↑】【↓】keys to select a desired item. This is the basic operation flow.

**Note** If the【SET】key on the **OPX-2A** is pressed while internal processing is being performed, the top screen will not change to any of its sub-screens and "mEm-bUSY" will be shown on the display. Be sure to wait until all internal processing is completed, before pressing the【SET】key.

■ **How to input values**

As an example, how to change "+30" to "−100" is explained.

Basic operations

- Use the【↑】【↓】keys to increase/decrease the value or change the sign.
  Use the【←】【→】keys to move to the digit you want to edit.
- If positive and negative values are differentiated, each value is preceded by a sign.
- You can edit the digit currently blinking.

1. First, change the 10's place from "3" to "0".
   Press the【←】key once to move to the 10's digit you want to edit.
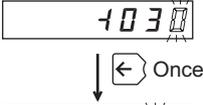
   ← Once

2. Press the【↓】key three times to change the value to "0".

   ↓ 3 times
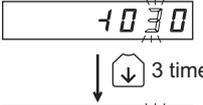
3. Next, change the 100's place from "0" to "1".
   Press the【←】key once to move to the 100's digit you want to edit.
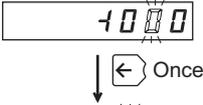
   ← Once

4. Press the【↑】key to change the value to "1".
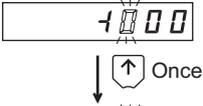
   ↑ Once

5. Next, change the sign.
   Press the【←】key once to move to the sign digit you want to edit.
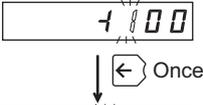
   ← Once

6. Press the【↑】or【↓】key once to change the sign to "−".

   ↑ or ↓
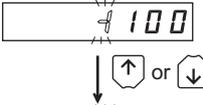
7. After all digits have been changed, press the key to confirm the value.
   All digits comprising the value blink for approx. 2 seconds.

   SET Once
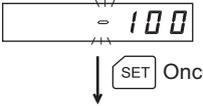
   Confirmed

Note If the value you have input is outside the setting range, "Error" will be displayed for 1 second.
If this error display appears, input a different value that falls within the setting range.

3-7   Edit lock function

Enable the edit lock function if you want to prevent operation data and parameters from being edited or cleared. Operation data and parameters cannot be changed or deleted while the edit lock function is enabled.

● **Setting the edit lock function**

In the top screen of each operation mode, press the【$\frac{MODE}{ESC}$】key for at least 5 seconds. The display will show "LocK" and the edit lock function will be enabled.
The "LOCK" LED in the LED indicator area will also be lit.

LocK

"LOCK" lit
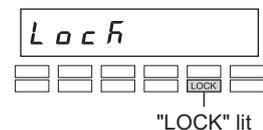
● **Canceling the edit lock function**

Again in the top screen of each operation mode, press the【$\frac{MODE}{ESC}$】key for at least 5 seconds. The display will show "UnLocK" and the edit lock function will be cancelled.
The "LOCK" LED in the LED indicator area will turn off.

UnLocK

3-8   Rewriting the driver's non-volatile memory

Operation data and parameters are saved to the driver's non-volatile memory. The non-volatile memory can be rewritten approx. 100,000 times. The non-volatile memory will be rewritten after one of the following operations is performed:

- Edit any operation data or parameter
- Download data from the **OPX-2A** to the driver
- Initialize driver operation data and parameters

4   Installation and connection of the OPX-2A

4-1   Location for installation

The **OPX-2A** is designed and manufactured for installation in equipment. Install it in a well-ventilated location that provides easy access for inspection. The location must also satisfy the following conditions:

- Inside an enclosure that is installed indoors (provide vent holes)
- Operating ambient temperature 0 to +40 °C (+32 to +104 °F) (non-freezing)
- Operating ambient humidity 85% or less (no condensation)
- Area that is free of explosive atmosphere or toxic gas (such as sulfuric gas) or liquid
- Area not exposed to direct sun
- Area free of excessive amount of dust, iron particles or the like
- Area not subject to splashing water (rain, water droplets), oil (oil droplets) or other liquids
- Area free of excessive salt
- Area not subject to continuous vibration or excessive shocks
- Area free of excessive electromagnetic noise (from welders, power machinery, etc.)
- Area free of radioactive materials, magnetic fields or vacuum
- 1000 m (3300 ft.) or less above sea level

4-2   Installation method

Using a metal plate of 1 to 3 mm (0.04 to 0.12 in.) in thickness, insert the **OPX-2A** into the mounting hole from the front side and securely affix the **OPX-2A**.

• Dimension of mounting hole [mm (in.)]

$92 \, {}^{+0.8}_{0} \, (3.62 \, {}^{+0.031}_{0})$

$68 \, {}^{+0.7}_{0}$ $(2.68 \, {}^{+0.028}_{0})$
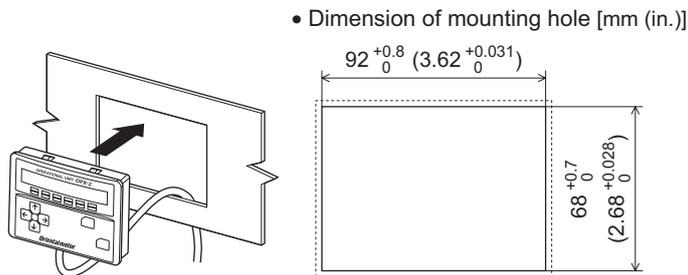
Removing method

Press all of the four hooks provided on top and bottom of the **OPX-2A**. In this condition, press the **OPX-2A** forward to release.

Hook
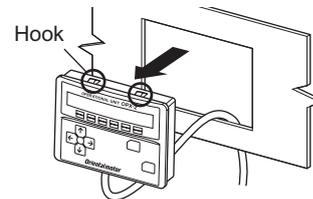
4-3　　Connecting to the driver

Plug the connector attached to the end of the **OPX-2A** cable into the data edit connector (CN3) on the driver, and then turn on the power to the driver.
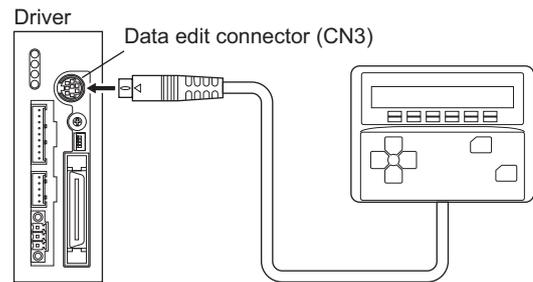
Note

- When operation data and parameters are set on the **OPX-2A**, they will be stored in the driver. Once stored in the driver, the data will not be cleared even after the **OPX-2A** is disconnected from the driver.
- Turning on the power to the driver will also turn on the power to the **OPX-2A**. Turning off the driver power will turn off the **OPX-2A** power.
- Turn off the driver power before connecting or disconnecting the **OPX-2A** cable.

5   Screen transitions

Note There are the following restrictions while the edit lock function is effective.
- Data mode, parameter mode, copy mode:
  Although they are displayed on the screen, they are unable to operate.
- Clearing the alarm and warning records, clear data, position preset, encoder counter preset, teaching: They are not displayed on the screen.

Data mode
dAtA

MODE
ESC

Parameter mode

SET

Operation data
No. selection 1
dAtA-01

SET

↓

Positioning mode
01-incAbS

↑ ↓

Position
01-PoS

↑ ↓

Operating speed
01-uEL

↑ ↓

Operating mode
01-FUnc

SET

↓

Single
SnGL

↑ ↓

Link1
Lin1

↑ ↓

Link2
Lin2

SET

Dwell time
00.000

↑

Sequential positioning
01-SEq

↑ ↓

Acceleration rate
01-Acc

↑ ↓

Deceleration rate
01-dEc

↑ ↓

Clear data
01-cLr

↑ ↓

↑

Operation data
No. selection 63
dAtA-63

↑ ↓

In the lower level except the top screen, press the [MODE ESC] key to return to the previous level.

Screen transitions

Test mode

System parameters

Speed parameters	Return-to-home parameters	Alarm/warning parameters	Common parameters
APP-2	APP-3	APP-4	APP-5

SET

Common acceleration rate	Home-seeking mode	Stepout detection band	Software overtravel
APP-2-00	APP-3-00	APP-4-00	APP-5-00

Common deceleration rate	Operating speed of home-seeking	Overvoltage warning	Positive software limit
APP-2-01	APP-3-02	APP-4-17	APP-5-01

Starting speed	Acceleration (deceleration) rate of home-seeking	Overheat warning	Negative software limit
APP-2-02	APP-3-03	APP-4-19	APP-5-02

Jog operating speed	Starting speed of home-seeking		Display mode of the data setter speed
APP-2-06	APP-3-04		APP-5-03

Jog acceleration (deceleration) rate	Position offset of home-seeking		Communication timeout action
APP-2-07	APP-3-05		APP-5-06

Jog starting speed	Starting direction of home-seeking		Receive period
APP-2-08	APP-3-06		APP-5-07

Acceleration (deceleration) rate type	SLIT detection with home-seeking		Response interval
APP-2-09	APP-3-07		APP-5-08

	TIM signal detection with home-seeking		Receive monitoring
	APP-3-08		APP-5-09

	Backward steps in 2-sensor mode home-seeking		Stepout detection action
	APP-3-09		APP-5-10

In the lower level except the top screen, press the [MODE ESC] key to return to the previous level.

Parameter mode ——————————————————————————————— Test mode
ㅌ ㄷ 5 ㄷ   [MODE ESC]

[SET]

Application parameters → ← System parameters
P A r - 5 4 5

[SET]

Operation setting
5 4 5 - 0   ← → Communication
5 4 5 - 1

[SET]   [SET]

Motor rotation direction
5 4 5 - 0 - 1 0

[↑] [↓]

Stepout detection
5 4 5 - 0 - 1 2

[↑] [↓]

Motor step angle
5 4 5 - 0 - 1 3

[↑] [↓]

Encoder electronic gear A
5 4 5 - 0 - 1 4

[↑] [↓]

Encoder electronic gear B
5 4 5 - 0 - 1 5

[↑] [↓]

Communication axis number
5 4 5 - 1 - 0 0

[↑] [↓]

Communication protocol
5 4 5 - 1 - 0 1

[↑] [↓]

Communication parity
5 4 5 - 1 - 0 2

[↑] [↓]

Communication stop bit
5 4 5 - 1 - 0 3

[↑] [↓]

Transmission waiting time
5 4 5 - 1 - 0 4

[↑] [↓]

Communication timeout
5 4 5 - 1 - 0 5

[↑] [↓]

Communication error alarm
5 4 5 - 1 - 0 6

[↑] [↓]

I/O test
ㅌ ㄷ 5 ㄷ - 1 ㅇ   [SET]

[↓]

Input test 1
ı n 1   ı ı ı ı ı

[↑] [↓]

Input test 2
ı n 2   ı ı ı ı ı ı

[↑] [↓]

Input test 3
ı n 3   ı ı ı ı

[↑] [↓]

Output test 1
ㅇ 凵 ㄷ 1

[↓]

Output test 2
ㅇ 凵 ㄷ 2

[↑]

JOG operation
J ㅇ G   [SET]

[↑] [↓]

Operation is in progress
- 1 2 3 4 5 6

Positioning operation
ㅇ P E - d A ㄷ A   [SET]

[↑] [↓]

Operation data No. selection 1
5 E L d A ㄷ A 0 1

[↑] [↓]

Operation data No. selection 63
5 E L d A ㄷ A 6 3

[↑] [↓]

→ Copy mode

Return-to-home operation
$oPE-HonE$

[SET] Perform return-to-home operation
$do\ HonE$

[SET] → Processing is in progress (blinking display)

Position preset
$P-PrESEt$

[SET] Perform position preset
$do\ PrESEt$

[SET] → Processing is in progress (blinking display)

Encoder counter preset
$Ec-PrESEt$

[SET] Perform encoder counter preset
$do\ PrESEt$

[SET] → Processing is in progress (blinking display)

Teaching
$tEAcH$

[SET] Perform teaching
0

[SET]

Operation data No. selection 1
$t-dAtA-01$

[SET] → Data is being written. (blinking display)

Operation data No. selection 63
$t-dAtA-63$

[SET] → Data is being written. (blinking display)

[SET] Output test 1
$oUt1\ \ \ --$

[SET] Output test 2
$oUt2\ \ ----$

[SET] Perform positioning operation
$ActdAtA01$

[SET] → Processing is in progress (blinking display)

[SET] Perform positioning operation
$ActdAtA63$

[SET] → Processing is in progress (blinking display)

In the lower level except the top screen, press the [MODE ESC] key to return to the previous level.

Screen transitions

Test mode

Copy mode
c o P Y

MODE / ESC

SET

Download
L o A d

SET

| Data bank selection 0 | SET | Processing is in progress (blinking display) |
| L o A d   0 | | |

| Data bank selection 3 | SET | Processing is in progress (blinking display) |
| L o A d   3 | | |

| Data bank selection 2 | SET | Processing is in progress (blinking display) |
| L o A d   2 | | |

| Data bank selection 1 | SET | Processing is in progress (blinking display) |
| L o A d   1 | | |

Upload
S A u E

SET

| Data bank selection 0 | SET | Processing is in progress (blinking display) |
| S A u E   0 | | |

| Data bank selection 3 | SET | Processing is in progress (blinking display) |
| S A u E   3 | | |

| Data bank selection 2 | SET | Processing is in progress (blinking display) |
| S A u E   2 | | |

| Data bank selection 1 | SET | Processing is in progress (blinking display) |
| S A u E   1 | | |

Verification
u E r i F Y

SET

| Data bank selection 0 | SET | Verification result: Matched |
| u E r i F Y   0 | | G o o d |

| Data bank selection 3 | SET | Verification result: Unmatched |
| u E r i F Y   3 | | E r r o r |

| Data bank selection 2 | |
| u E r i F Y   2 | |

| Data bank selection 1 | |
| u E r i F Y   1 | |

Monitor mode

Initialization
ini

SET

Initialize operation data
ini-dAtA
SET ------> Processing is in progress
(blinking display)

Initialize application parameters
ini-APP
SET ------> Processing is in progress
(blinking display)

Initialize system parameters
ini-SyS
SET ------> Processing is in progress
(blinking display)

Initialize all data
ini-ALL
SET ------> Processing is in progress
(blinking display)

In the lower level except the top screen, press the [MODE ESC] key to return to the previous level.

6 Monitor mode

6-1 Overview of the monitor mode

● **Monitoring the operating status**

You can monitor the command motor speed, command position, encoder counter, operation data number corresponding to the current operation, and operation data number currently selected in real time.

> **memo** A range capable to monitor with the **OPX-2A** is from −19,999,999 to 19,999,999 with up to eight digit numbers. However, only seven digit numbers can be shown on the display of the **OPX-2A**, so only the last seven digit numbers are shown when the monitored value is eight digit numbers, and a dot is marked on the lower right of the display.
> ● Display example

Actual value	−19,999,999	−10,000,001	−10,000,000	10,000,000	10,000,001	19,999,999
Displayed value	−9999999.	−0000001.	−0000000.	0000000.	0000001.	9999999.

● **Checking alarms/warnings, clearing alarm/warning records, and resetting alarms**

- If an alarm or warning generates, a corresponding alarm code or warning code will be displayed. You can check the code to identify the details of the alarm/warning.
- Up to ten most recent alarms/warnings can be displayed, starting from the latest one. You can also clear alarm/warning records.
- You can reset the alarms currently present.

● **Checking I/O signals**

You can check the ON/OFF status of each I/O signal of the driver.

6-2 Operation in the monitor mode

1. Use the 【MODE/ESC】key to select the monitor mode.

2. Press the【SET】key in the top screen of the monitor mode.

3. Use the【↑】【↓】keys to select the item you want to monitor.
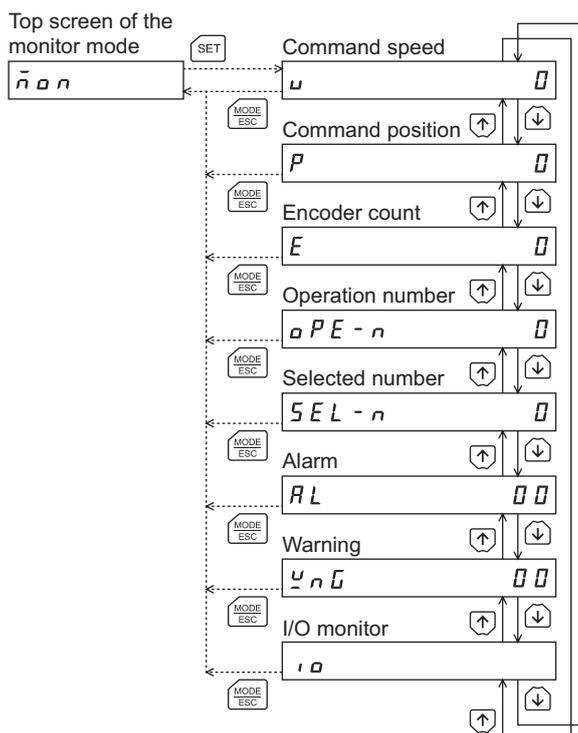
6-3   Monitor items

■ Command speed

You can check the command speed of the motor (unit: Hz).
While the motor is rotating in the − direction, "−" is shown in front of the displayed value. If the speed is indicated by an absolute value, no sign is shown to indicate the rotating direction. You can select the value display format using the "display mode of the data setter speed" parameter [APP-6-03] (p.32).

■ Command position

You can check the command position of the motor with reference to the home position.
If a resolution is set, an appropriate value based on the resolution is shown as steps.

■ Encoder count

You can check the encoder counter value.

■ Operation number

You can check the operation data number corresponding to the data used in the current positioning operation.

■ Selected number

You can check the operation data number currently selected.

■ Alarm

When an alarm generates, a corresponding alarm code will be displayed.
You can also reset alarms or check and clear alarm records.
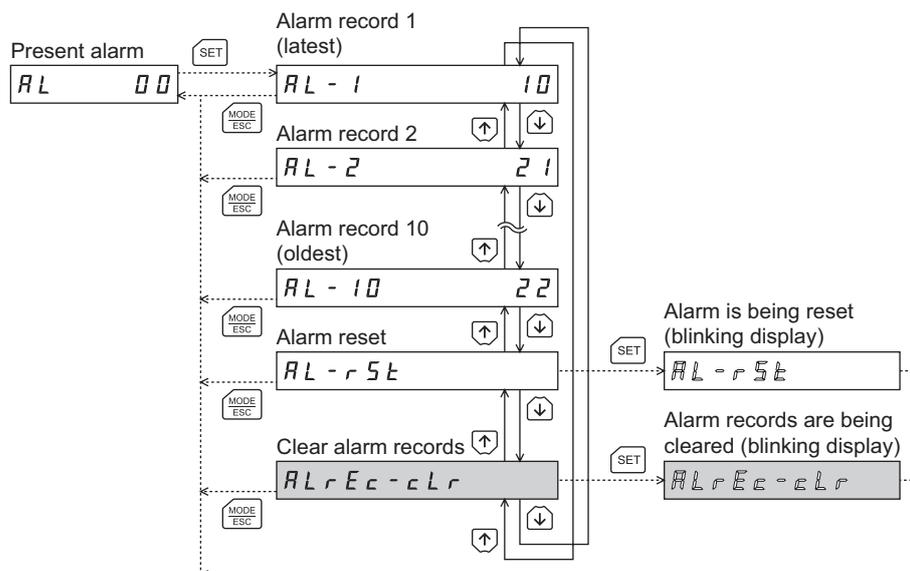
* If operations are limited by the edit lock function, the screen text in gray is not shown.

Note
- Do not turn off the driver power while an alarm is being reset or alarm records are being cleared (=while the display is blinking). Doing so may damage the data.
- Some alarms cannot be reset on the **OPX-2A**. Check by the following table. To reset these alarms, you must cycle the driver power.

● **Alarm code list**

Code	Alarm name	Resetting on the **OPX-2A**	Number of times the driver's ALARM LED blinks
10h	Overflow	Possible	4
21h	Overheat		2
22h	Overvoltage	Not possible	3
41h	EEPROM error		9
60h	±LS both sides active	Possible	7
61h	Reverse limit sensor connection		
62h	Home seeking error		
63h	No HOMES		
64h	TIM, Z, SLIT input error		
66h	Overtravel		
67h	Software overtravel		
6Ah	Home seeking offset error		
70h	Invalid operation data		
84h	RS-485 communication error	Not possible	
85h	RS-485 communication timeout	Possible	
81h	Network bus error		
8Eh	Network converter error		

● **How to reset an alarm**

1. While an alarm is displayed, press the【SET】key to move to the lower level.

2. Press the【↑】key twice to select the alarm reset screen.

3. Press the【SET】key.
   The alarm is reset.

● **How to check an alarm record**

You can check up to ten most recent alarms, starting from the latest one.

1. While an alarm is displayed, press the【SET】key to move to the lower level.
   The latest alarm is displayed.

2. Press the【↓】key.
   The second latest alarm is displayed.

3. Every time the【↓】key is pressed, the next older alarm will be displayed. Use the【↑】【↓】keys to select the alarm record you want to check.

● **How to clear all alarm records**

You can clear all alarm records at once.

1. While an alarm is displayed, press the【SET】key to move to the lower level.

2. Press the【↑】key and select the alarm record clear screen.

3. Press the【SET】key.
   All alarm records are cleared.

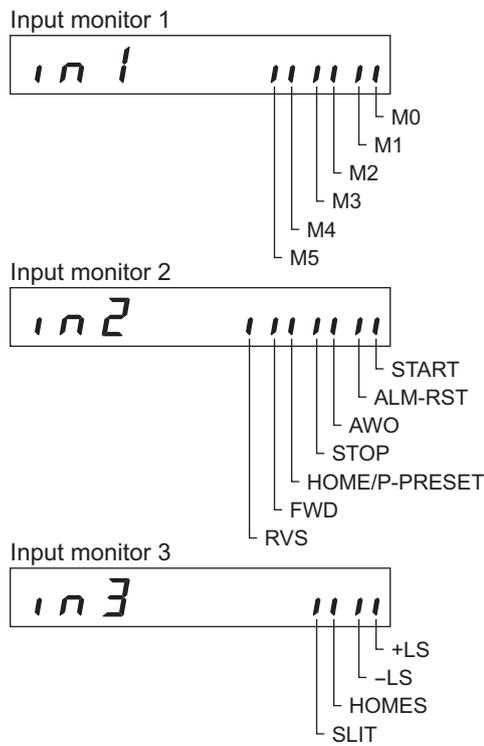## ■ Warning

When a warning generates, a corresponding warning code will be displayed.
You can also check or clear warning records.
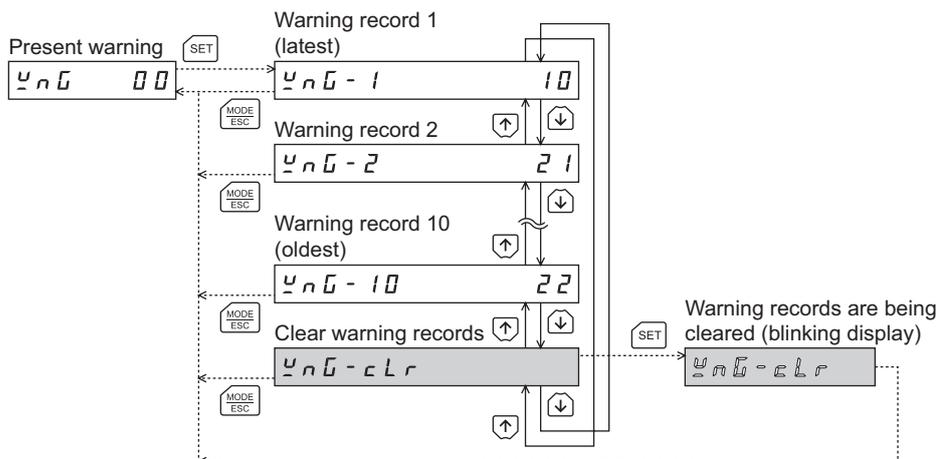
* If operations are limited by the edit lock function, the screen text in gray is not shown.

Note
- Do not turn off the driver power while warning records are being cleared (=while the display is blinking). Doing so may damage the data.
- You can also clear the warning records by turning off the driver power.

● Warning code list

Code	Warning name
10h	Overflow
21h	Overheat
22h	Overvoltage
84h	RS-485 communication error

● How to check a warning record

You can check up to ten most recent warnings, starting from the latest one.

1. While a warning is displayed, press the【SET】key to move to the lower level.
   The latest warning is displayed.

2. Press the【↓】key.
   The second latest warning is displayed.

3. Every time the【↓】key is pressed, the next older warning will be displayed. Use the【↑】【↓】keys to select the warning record you want to check.

● How to clear all warning records

You can clear all warning records at once.

1. While a warning is displayed, press the【SET】key to move to the lower level.

2. Press the【↑】key and select the warning record clear screen.

3. Press the【SET】key.
   All warning records are cleared.

■ I/O monitor

You can check the ON/OFF status of each I/O signal of the driver.

Top screen of
the I/O monitor
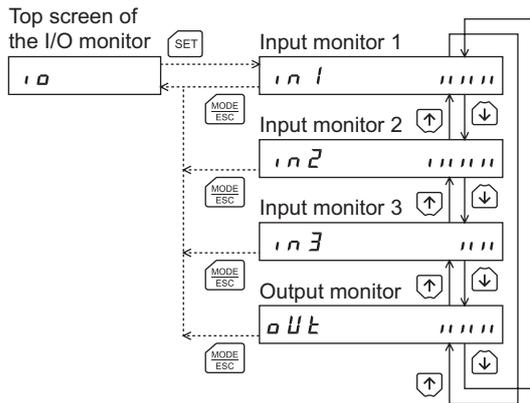
Each digit on the 7-segment LED display corresponds to a signal. The LED is lit when the signal is ON, and it is unlit when the signal is OFF.

● **Input signals**

Input monitor 1

- M0
- M1
- M2
- M3
- M4
- M5

Input monitor 2

- START
- ALM-RST
- AWO
- STOP
- HOME/P-PRESET
- FWD
- RVS

Input monitor 3

- +LS
- –LS
- HOMES
- SLIT

● **Output signals**

- MOVE
- ALM
- OUT1
- OUT2
- OUT3
- OUT4
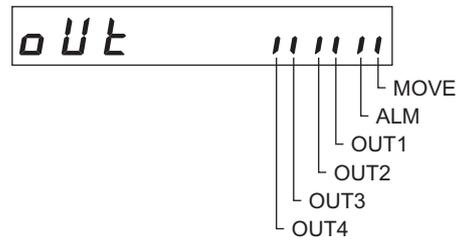
7　Data mode

Up to 63 sets of motor operation data can be set. Once set, the operation data is stored in the driver. The data will not be lost even after the **OPX-2A** is disconnected from the driver.
Before setting operation data, read the "**CRK** Series FLEX Built-in Controller type USER MANUAL" carefully to understand the basic operations, functions and other details of the driver.

Note
- Operation data has significant bearing on motor operation. Before setting any operation data, make sure you fully understand the content of the operation data.
- If operations are limited by the edit lock function, operation data cannot be edited.

7-1　Operation in the data mode

1. Use the 【MODE/ESC】 key to select the data mode.

2. Press the 【SET】 key on the top screen of the data mode.

3. Use the 【↑】【↓】 keys to select a desired operation data number.

4. Press the 【SET】 key.
   The display changes to the operation data screen.

5. Use the 【SET】 key to select the operation data item you want to set.

6. When pressing the 【SET】 key on the last operation data item, the display returns to the operation data No. screen.
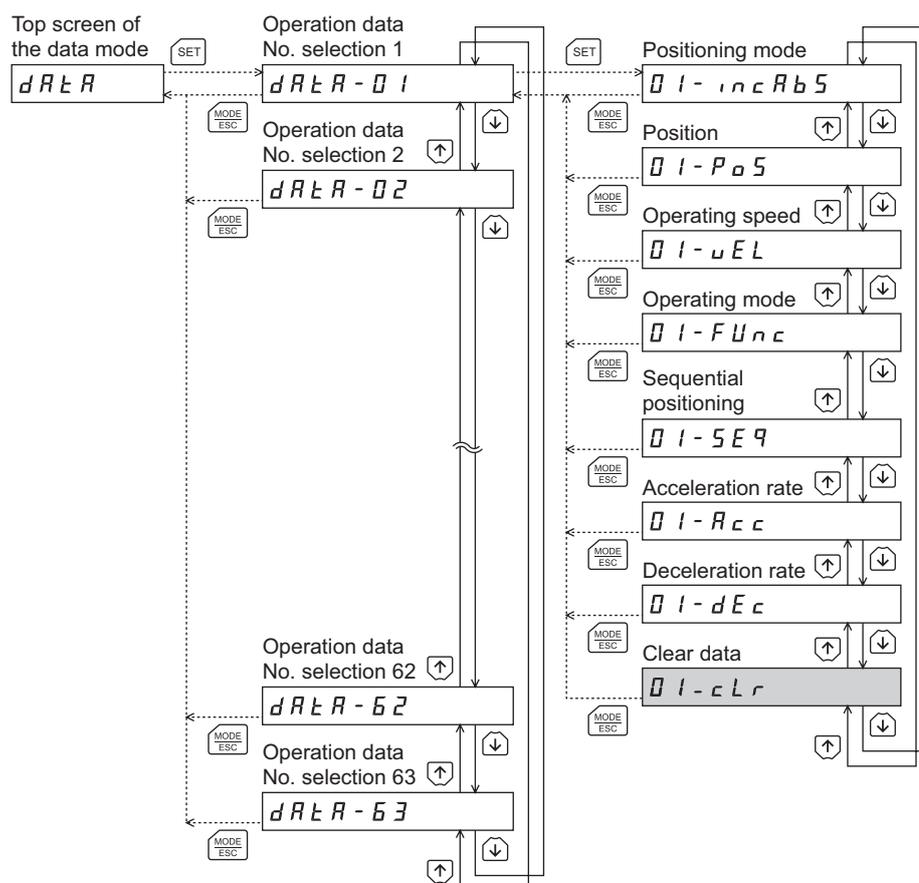
* If operations are limited by the edit lock function, the screen text in gray is not shown.

Note	• If the value you have input is outside the setting range, "Error" will be displayed for 1 second. If this error display appears, input a different value that falls within the setting range. • If the【SET】key on the **OPX-2A** is pressed while internal processing is being performed, the top screen will not change to any of its sub-screens and "mEm-bUSY" will be shown on the display. Be sure to wait until all internal processing is completed, before pressing the【SET】key.

7-2   How to select the operation data number

You can select a desired operation data set based on a combination of ON/OFF statuses of M0 through M5 inputs of the driver.

Operation data number	M5	M4	M3	M2	M1	M0
Sequential positioning	OFF	OFF	OFF	OFF	OFF	OFF
1	OFF	OFF	OFF	OFF	OFF	**ON**
2	OFF	OFF	OFF	OFF	**ON**	OFF
•	•	•	•	•	•	•
•	•	•	•	•	•	•
•	•	•	•	•	•	•
61	**ON**	**ON**	**ON**	**ON**	OFF	**ON**
62	**ON**	**ON**	**ON**	**ON**	**ON**	OFF
63	**ON**	**ON**	**ON**	**ON**	**ON**	**ON**

7-3   Setting items

Setting item	Setting range	Initial value	Description
Positioning mode	inc: Incremental mode AbS: Absolute mode	inc	Selects how to specify the position (travel amount) in positioning operation (absolute mode or incremental mode).
Position	−8,388,608 to +8,388,607 steps	0	Sets the position (distance) for positioning operation.
Operating speed	1 to 500,000 Hz	1000	Sets the operating speed in positioning operation and continuous operation.
Operating mode	SnGL: Single Lin1: Link1 Lin2: Link2	SnGL	Sets perform positioning operation as single-motion or linked-motion operation.
Sequential positioning	0: Disable 1: Enable	0	Sets enable or disable sequential positioning operation.
Acceleration rate	0.001 to 1000.000 ms/kHz	30.000	Sets the acceleration rate in positioning operation and continuous operation. *
Deceleration rate			Sets the deceleration rate in positioning operation and continuous operation. *
Dwell time	0 to 50.000 s	0	Set the dwell time to be used in linked-motion operation 2.

* This item is effective when the "acceleration (deceleration) rate type" parameter [APP-2-09] is set to "separate". If this parameter is set to "common", the values of the "common acceleration rate" [APP-2-00] and "common deceleration rate" [APP-2-01] parameters will be used (initial value: common).

■ How to set the dwell time

When displaying the "LINK2" on the "operating mode" and pressing the【SET】key, the screen to set the dwell time is displayed.
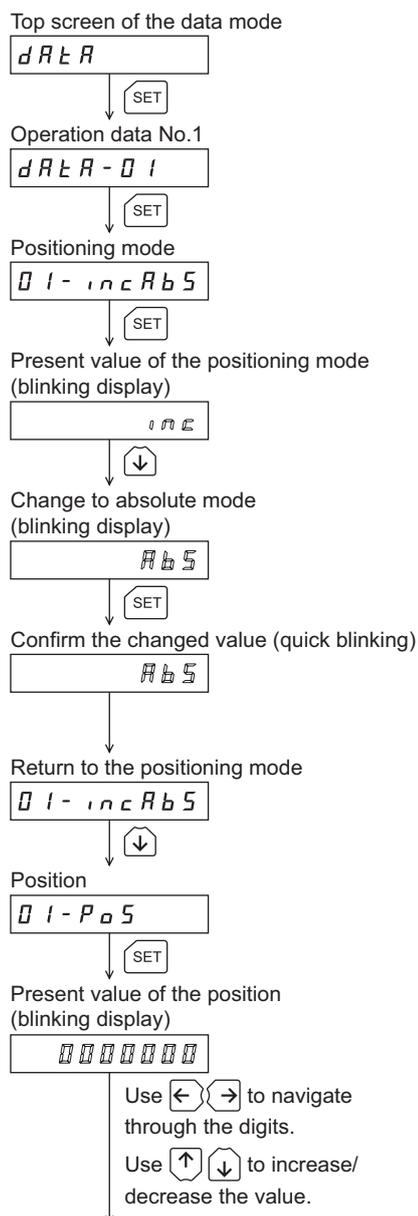Input the dwell time using the【↑】【↓】【←】【→】keys and press the【SET】key.
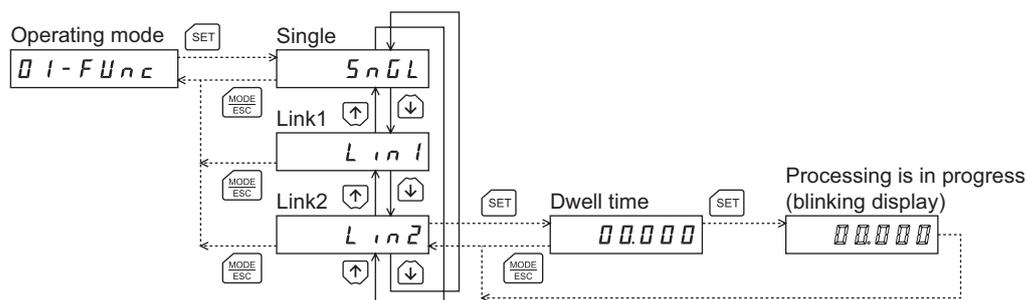

7-4   Setting example

This section explains the positioning mode of the operation data No.1 and how to change the position.
- Positioning mode: Changes from incremental mode to absolute mode.
- Position: Changes from 0 step to 10000 steps.

1. Use the【MODE/ESC】key to select the data mode.
   The "DATA" LED is lit.

   Top screen of the data mode
   `d A t A`
   ↓ SET

2. Press the【SET】key on the top screen of the data mode.
   The display changes to the operation data No.1 screen.

   Operation data No.1
   `d A t A - 0 1`
   ↓ SET

3. Press the【SET】key.
   The display changes to the positioning mode screen.

   Positioning mode
   `0 1 - i n c A b S`
   ↓ SET

4. Press the【SET】key again.
   The present set value of the positioning mode is displayed with blinking.

   Present value of the positioning mode
   (blinking display)
   `i n c`
   ↓

5. Press the【↓】key once to select "AbS."

   Change to absolute mode
   (blinking display)
   `A b S`
   ↓ SET

6. Press the【SET】key.
   The blinking speed of the input value becomes quickly and the value is set.
   The display returns to the positioning mode screen.

   Confirm the changed value (quick blinking)
   `A b S`
   ↓

   Return to the positioning mode
   `0 1 - i n c A b S`
   ↓

7. Press the【↓】key.
   The display changes to the position screen.

   Position
   `0 1 - P o S`
   ↓ SET

8. Press the【SET】key.
   The present set value of the position is displayed with blinking.

   Present value of the position
   (blinking display)
   `0 0 0 0 0 0 0`

9. Use the【↑】【↓】【←】【→】keys to select "10000".
   The selected digit is displayed with blinking.

   Use ← → to navigate through the digits.

   Use ↑ ↓ to increase/decrease the value.

Input 10000 (blinking display)

```
00 10000
```

⤓ SET

10. Press the【SET】key.
    The blinking speed of the input value becomes quickly and
    the value is set.
    The display returns to the position screen.

Confirm the changed value (quick blinking)

```
00 10000
```

↓

Return to the position

```
0 1 - P o 5
```

⤓ MODE ESC

11. Press the【MODE/ESC】key.
    The display returns to the operation data No.1 screen.

Return to the operation data No.1

```
d A t A - 0 1
```
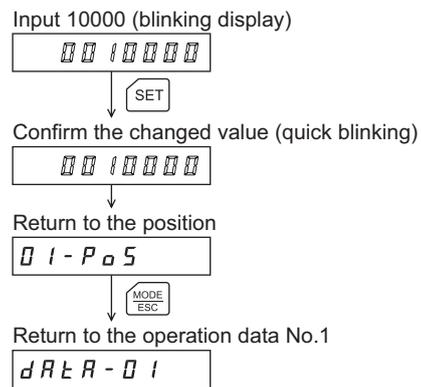
7-5   Initialization of the selected operation data

All of the set value for the selected operation data number can be reverted to the initial values.

1. Use the【MODE/ESC】key to select the data mode.
   The "DATA" LED is lit.

Top screen of the data mode

```
d A t A
```

⤓ SET

2. Press the【SET】key on the top screen of the data mode.
   The display changes to the operation data No.1 screen.

Operation data No.1

```
d A t A - 0 1
```

⤓ SET

3. Press the【SET】key.
   The display changes to the positioning mode screen.

Positioning mode

```
0 1 - i n c A b 5
```

⤓ ↑ Once

4. Press the【↑】key once.
   The display changes to the clear data screen.

Clear data

```
0 1 - c L r
```

⤓ SET

5. Press the【SET】key.
   The display changes to the screen to execute clearing.

Clear

```
d o   0 1 - c L r
```

⤓ SET

6. Press the【SET】key.
   The display blinks and the operation data No.1 is cleared.

Processing is in progress
(blinking display)

```
d o   0 1 - c L r
```
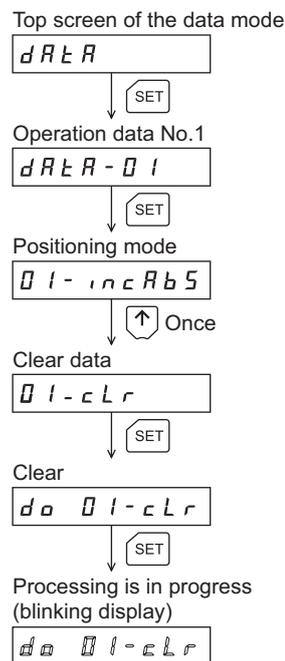
7-6   Initialization of all operation data

All of the operation data saved in the driver can be reverted to the initial values. Perform "Initialize operation data" of
the copy mode.
For the operation, check the screen transitions of the copy mode on p.16, or "10-6 Initializing driver data" on p.41.

8   Parameter mode

You can set parameters relating to motor operation and control. These parameters are saved in the driver.
Before setting parameters, read the "**CRK** Series FLEX Built-in Controller type <u>USER MANUAL</u>" carefully to understand the basic operations, functions and other details of the driver.

Note
- Parameters have significant bearing on motor operation. Before setting any parameter, make sure you fully understand the content of the parameter.
- If operations are limited by the edit lock function, parameters cannot be edited.

8-1   Types of parameters

Application parameters and system parameters are handled in the parameter mode.

■ Application parameters

When an application parameter is changed, the new parameter becomes effective immediately.
Six types of parameters are available on the levels below the application parameter screen. These parameters are classified as follows.

Parameter classification	Description
I/O parameters	Set the parameters relating to I/O signals.
Motor parameters	Set the parameters relating to motor.
Speed parameters	Set the parameters relating to speed.
Return-to-home parameters	Set the parameters relating to return-to-home operation.
Alarm/warning parameters	Set the condition under which each alarm or warning generates.
Common parameters	Set the software overtravel, data setter display mode, RS-485 communication period, and whether to enable or disable misstep detection.

■ System parameters

When a system parameter is changed, the new parameter will become effective only after the power is cycled.
Two types of parameters are available on the levels below the system parameter screen. These parameters are classified as follows.

Parameter classification	Description
Operation setting parameters	Set the parameters relating to motor operation.
Communication parameters	Set the parameters relating to RS-485 communication.

8-2 Operation in the parameter mode

1. Use the【$\frac{MODE}{ESC}$】key to select the parameter mode.

2. Press the【SET】key on the top screen of the parameter mode.

3. Use the【↑】【↓】keys to select the application parameters or system parameters.

4. Press the【SET】key.
   The display changes to the parameter type selection screen.

5. Press the【SET】key.
   The display changes to the parameter item screen.

6. Use the【↑】【↓】keys to select the parameter you want to change.
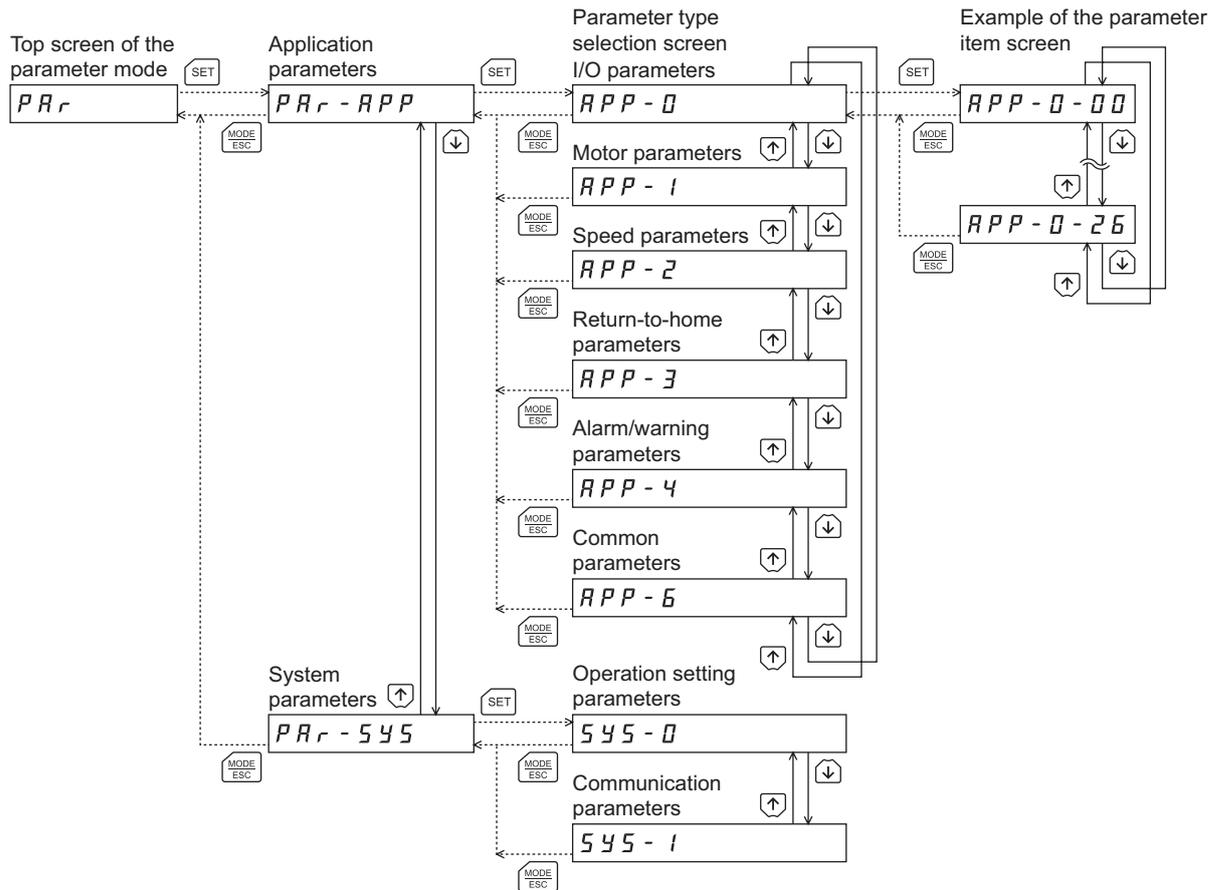
Note
- If the value you have input is outside the setting range, "Error" will be displayed for 1 second. If this error display appears, input a different value that falls within the setting range.
- If the【SET】key on the **OPX-2A** is pressed while internal processing is being performed, the top screen will not change to any of its sub-screens and "mEm-bUSY" will be shown on the display. Be sure to wait until all internal processing is completed, before pressing the【SET】key.

8-3   Setting example

Pressing the【SET】key on the parameter item screen enables parameter setting.
This section explains how to assign the ZSG output to the OUT1 output.

1. Use the【MODE/ESC】key to select the parameter mode.
    The "PAR" LED is lit.

    Top screen of the parameter mode

    `PAr`

    SET

2. Press the【SET】key on the top screen of the parameter mode.
    The display changes to the application parameter screen.

    Application parameter

    `PAr - APP`

    SET

3. Press the【SET】key.
    The display changes to the I/O parameter screen.

    I/O parameter

    `APP - 0`

    SET

4. Press the【SET】key again.
    The display changes to the START input mode parameter screen.

    START input mode parameter

    `APP - 0 - 00`

    ↓

5. Press the【↓】key five times to change the value to "6".
    The display changes to the OUT1 signal mode selection parameter screen.

    OUT1 signal mode selection parameter

    `APP - 0 - 06`

    SET

6. Press the【SET】key.
    The present set value of the OUT1 output is displayed with blinking.

    Present value of the "OUT1 signal mode selection" parameter (blinking display)

    `5`

    Use ← → to navigate through the digits.

    Use ↑ ↓ to increase/decrease the value.

7. Use the【↑】【↓】【←】【→】keys to select "10".
    "10" indicates the ZSG output.

    Set the OUT1 output to "10" (blinking display)

    `10`

    SET

8. Press the【SET】key.
    The blinking speed of the input value becomes quickly and the value is set.
    The display returns to the OUT1 signal mode selection parameter screen.

    Confirm the value (quick blinking)

    `10`

    ↓

    Return to the "OUT1 signal mode selection" parameter

    `APP - 0 - 06`

8-4   Description of application parameters

■ I/O parameters

Parameter item screen	Parameter name	Description	Setting range	Initial value
APP-0-00	START input mode	Sets whether to input the START input signal via I/O or RS-485 communication.	0: RS-485 communication 1: I/O	1
APP-0-01	I/O STOP input	Changes the setting to enable/disable STOP input of I/O.	0: Disable 1: Enable	1
APP-0-02	STOP action	Sets how the motor should stop when a STOP input is turned ON.	0: Immediate stop 1: Decelerate stop 2: Immediate stop&Current OFF 3: Decelerate stop&Current OFF	1
APP-0-03	STOP contact configuration	Sets the STOP input logic.	0: Make (N.O.) 1: Brake (N.C.)	1
APP-0-04	C-ON logic configuration	Sets the C-ON logic for RS-485 communication.	0: 0=Not excited, 1=Excited 1: 0=Excited, 1=Not excited	0
APP-0-06	OUT1 signal mode selection	Sets the function assigned to the OUT1 to OUT4 output.	5: AREA 11: R-OUT1 6: TIM 12: R-OUT2 7: READY 13: STEPOUT 8: WNG 14: O.H. 9: HOME-P 15: R-OUT3 10: ZSG 16: R-OUT4	5
APP-0-07	OUT2 signal mode selection			7
APP-0-08	OUT3 signal mode selection			8
APP-0-09	OUT4 signal mode selection			9
APP-0-10	HOME/P-PRESET input switching	Sets whether to use HOME or P-PRESET input.	0: HOME 1: P-PRESET	0
APP-0-11	Motor excitation mode	Sets whether to control the motor excitation via I/O or RS-485 communication.	0: RS-485 communication 1: I/O	1
APP-0-12	HOME/FWD/RVS input mode	Sets whether to input the HOME, FWD and RVS input signals via I/O or RS-485 communication.		
APP-0-13	Data No. input mode	Sets whether to input the M0 to M5 input signals via I/O or RS-485 communication.		
APP-0-14	AWO contact configuration	Sets the AWO input logic.	0: Make (N.O.) 1: Brake (N.C.)	0
APP-0-16	Hardware overtravel detection	Sets whether to enable or disable hardware overtravel detection using LS inputs.	0: Disable 1: Enable	1
APP-0-17	LS contact configuration	Sets the ±LS input logics.	0: Make (N.O.) 1: Brake (N.C.)	0
APP-0-18	HOMES contact configuration	Sets the HOMES input logic.		
APP-0-19	SLIT contact configuration	Sets the SLIT input logic.		
APP-0-20	Overtravel action	Sets the motor action to take place upon the occurrence of overtravel.	0: Immediate stop 1: Decelerate stop	0
APP-0-21	Preset position	Sets the preset position.	−8,388,608 to +8,388,607 step	0
APP-0-22	Area 1	Sets the range for AREA output. The AREA output will be ON when the motor is inside the area set by the area 1 and area 2.		
APP-0-23	Area 2			
APP-0-26	Encoder counter preset value	Sets the encoder counter preset value.		

■ Motor parameters

Parameter item screen	Parameter name	Description	Setting range	Initial value
APP-1-00	Operating current	Sets the motor operating current based on the rated current being 100%.	5 to 100%	100
APP-1-01	Standstill current	Sets the motor standstill current as a percentage of the rated current, based on the rated current being 100%.	5 to 50%	50

■ Speed parameters

Parameter item screen	Parameter name	Description	Setting range	Initial value
APP-2-00	Common acceleration rate	Sets the common acceleration rate in positioning operation and continuous operation.	0.001 to 1000.000 ms/kHz	30.000
APP-2-01	Common deceleration rate	Sets the common deceleration rate in positioning operation and continuous operation.		
APP-2-02	Starting speed	Sets the starting speed in positioning operation and continuous operation. The motor will operate at the starting speed if the operating speed is below the starting speed.	1 to 500,000 Hz	100
APP-2-06	Jog operating speed	Sets the operating speed for JOG operation.		1000
APP-2-07	Jog acceleration (deceleration) rate	Sets the acceleration/deceleration rate for JOG operation.	0.001 to 1000.000 ms/kHz	30.000
APP-2-08	Jog starting speed	Sets the starting speed for JOG operation.	1 to 500,000 Hz	100
APP-2-09	Acceleration (deceleration) rate type	Sets whether to use the common acceleration/deceleration rate or the acceleration/deceleration rate specified for the operation data.	0: Common 1: Separate	0

■ Return-to-home parameters

Parameter item screen	Parameter name	Description	Setting range	Initial value
APP-3-00	Home-seeking mode	Set the mode for return-to-home operation.	0: 2 sensors 1: 3 sensors	1
APP-3-02	Operating speed of home-seeking	Sets the operating speed for return-to-home operation.	1 to 500,000 Hz	1000
APP-3-03	Acceleration (deceleration) rate of home-seeking	Sets the acceleration/deceleration rate for return-to-home operation.	0.001 to 1000.000 ms/kHz	30.000
APP-3-04	Starting speed of home-seeking	Sets the starting speed for return-to-home operation.	1 to 500,000 Hz	100
APP-3-05	Position offset of home-seeking	Sets the amount of offset from mechanical home.	−8,388,608 to +8,388,607 step	0
APP-3-06	Starting direction of home-seeking	Sets the starting direction for home detection.	0: Negative direction 1: Positive direction	1
APP-3-07	SLIT detection with home-seeking	Sets whether or not to concurrently use the SLIT input for return-to-home operation.	0: Disable 1: Enable	0
APP-3-08	TIM signal detection with home-seeking	Sets whether or not to concurrently use the TIM (ZSG) output for return-to-home operation.	0: Disable 1: Enable (TIM) 2: Enable (ZSG)	0
APP-3-09	Backward steps in 2-sensor mode home-seeking	Sets the travel amount after the motor pulls out from the LS sensor in 2-sensor return-to-home operation.	0 to 32767 step	200

■ Alarm/warning parameters

Parameter item screen	Parameter name	Description	Setting range	Initial value
APP-4-00	Stepout detection band	Sets the judgment condition for misstep detection using the deviation (angle) between the command position and encoder counter value.	0.1 to 360.0 deg	7.2
APP-4-17	Overvoltage warning	Sets the voltage at which an overvoltage warning generates.	25.0 to 35.0 V	31.0
APP-4-19	Overheat warning	Sets the temperature at which an overheat warning generates.	40 to 85 °C (104 to 185 °F)	85

■ Common parameters

Parameter item screen	Parameter name	Description	Setting range	Initial value
APP-6-00	Software overtravel	Sets whether to enable or disable software overtravel detection using soft limits.	0: Disable 1: Enable	1
APP-6-01	Positive software limit	Sets the value of soft limit in + direction.	−8,388,608 to +8,388,607 steps	8,388,607
APP-6-02	Negative software limit	Sets the value of soft limit in − direction.		−8,388,608
APP-6-03	Display mode of the data setter speed	Sets the display method of monitored speed in the **OPX-2A**.	0: Signed 1: Absolute	0
APP-6-06	Communication timeout action	Sets how to stop the motor when a communication timeout occurs.	0: Immediate stop 1: Decelerate stop	1
APP-6-07	Receive period	Sets the receive period for RS-485 communication.	0: Function disabled 0.01 to 9.99 sec.	0
APP-6-08	Response interval	Sets the response period for RS-485 communication.	0 to 1000 ms	50
APP-6-09	Receive monitoring	Sets the receive monitor period for RS-485 communication.	0.01 to 9.99 sec.	0.10
APP-6-10	Stepout detection action	Sets the operation to be performed when the deviation between the command position and encoder counter value reaches the stepout detection band.	0: No operation (alarm/ warning not present) 1: Warning 2: Alarm	0

8-5　Description of system parameters

■ Operation setting parameters

Parameter item screen	Parameter name	Description	Setting range	Initial value
SYS-0-10	Motor rotation direction	Sets the rotation direction of motor output shaft.	0: Positive direction=CCW 1: Positive direction=CW	1
SYS-0-12	Stepout detection	Sets whether to enable or disable the misstep detection function.	0: Disable 1: Enable	0
SYS-0-13	Motor step angle	Sets the motor step angle.	See table below.	0
SYS-0-14	Encoder electronic gear A	Sets the encoder electronic gear A.	1 to 250,000	500
SYS-0-15	Encoder electronic gear B	Sets the encoder electronic gear B.		

"Motor step angle" parameter [SYS-0-13] setting range

Setting	Step angle	Number of divisions	Setting	Step angle	Number of divisions
0	0.72°	1	8	0.0288°	25
1	0.36°	2	9	0.018°	40
2	0.288°	2.5	10	0.0144°	50
3	0.18°	4	11	0.009°	80
4	0.144°	5	12	0.0072°	100
5	0.09°	8	13	0.00576°	125
6	0.072°	10	14	0.0036°	200
7	0.036°	20	15	0.00288°	250

Note
- Step angles are theoretical values.
- With the geared type, the value of "step angle/gear ratio" becomes the actual step angle.

■ Communication parameters

Parameter item screen	Parameter name	Description	Setting range	Initial value
SYS-1-00	Communication axis number	Sets the axis number for RS-485 communication.	0 to 31	15
SYS-1-01	Communication protocol	Sets the protocol for RS-485 communication.	0: Modbus RTU 1: GW Ver.1	0
SYS-1-02	Communication parity	Sets the parity for RS-485 communication.	0: None 1: Even number 2: Odd number	1
SYS-1-03	Communication stop bit	Sets the stop bit for RS-485 communication.	0: 1 bit 1: 2 bits	0
SYS-1-04	Transmission waiting time	Sets the transmission waiting time for RS-485 communication.	0 to 1000.0 (1=0.1 ms)	10.0
SYS-1-05	Communication timeout	Sets the condition in which a communication timeout occurs in RS-485 communication.	0: Not monitored 1 to 10000 ms	0
SYS-1-06	Communication error alarm	Sets the condition in which a RS-485 communication error alarm generates. A communication error alarm generates after a RS-485 communication error has occurred by the number of times set here.	1 to 10 times	3

8-6 Initializing parameters

You can revert parameters saved in the driver to their initial values. Perform "Initialize operation data" of the copy mode.

For the operation, check the screen transitions of the copy mode on p.16, or "10-6 Initializing driver data" on p.41.

9　Test mode

9-1　Overview of the test mode

● **I/O test**

You can check the ON/OFF status of each input signal of the driver. You can also switch the ON/OFF status of each output signal on the **OPX-2A**. There is also an I/O test function with which you can check the connection status of the driver.

● **JOG operation**

You can operate the motor using the keys on the **OPX-2A**.

● **Positioning operation**

You can perform the positioning operation.

● **Return-to-home operation**

You can perform the return-to-home operation.

● **Position preset**

You can set the preset value as the command position.

● **Encoder counter preset**

You can set the preset value as the encoder counter value.

● **Teaching**

You can operate the motor using the keys on the **OPX-2A** and reflect the attained position in the operation data.

9-2　Operation in the test mode

1. Use the【 $\frac{MODE}{ESC}$ 】key to select the test mode.

2. Press the【SET】key in the top screen of the test mode.
   The display changes to the test mode item screen.

3. Use the【↑】【↓】keys to select the item you want to perform.
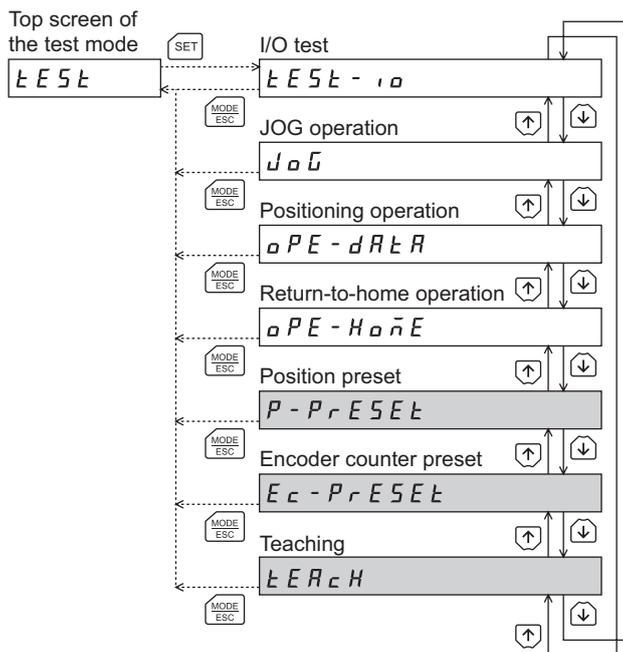
* If operations are limited by the edit lock function, the screen text in gray is not shown.

> **Note**
> - Stop the motor operation before changing to the test mode.
> - When you move from the top screen of the test mode to a lower level, following inputs will be disabled.
>   START input, FWD input, RVS input, HOME/P-PRESET input and M0 to M5 inputs.
> - If the【SET】key on the **OPX-2A** is pressed while internal processing is being performed, the top screen will not change to any of its sub-screens and "mEm-bUSY" will be shown on the display. Be sure to wait until all internal processing is completed, before pressing the【SET】key.

● **What happens when the【SET】key is pressed while the motor is operating**

While the motor is operating, you cannot move to any lower level from the top screen of the test mode. Pressing the【SET】key will generate an error, and "oPE-Err" will be shown. Be sure to stop the motor operation before pressing the【SET】key.

oPE-Err

9-3　　I/O test

When checking the connection condition of the driver, perform the I/O test.
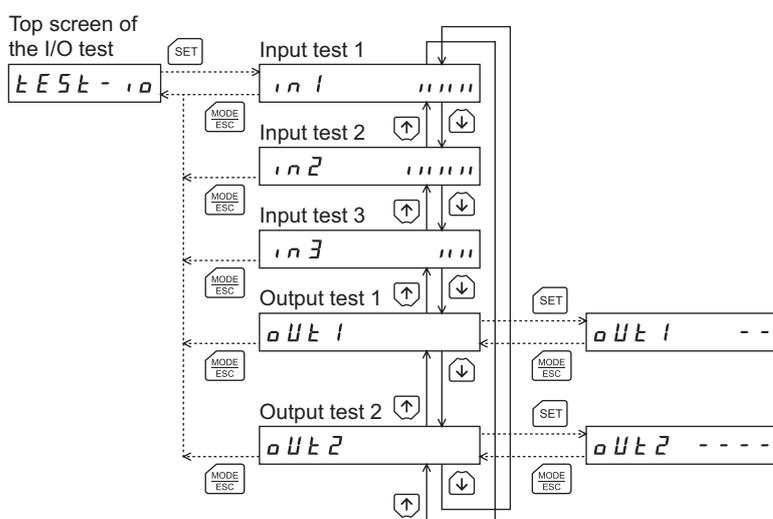
Each digit on the 7-segment LED display corresponds to a signal. The LED is lit when the input signal is ON, and it is unlit when the input signal is OFF.
Use the【↑】【↓】keys to switch the ON-OFF state of the output signal. "◻" is displayed when the signal is ON, while "–" is displayed when the signal is OFF.
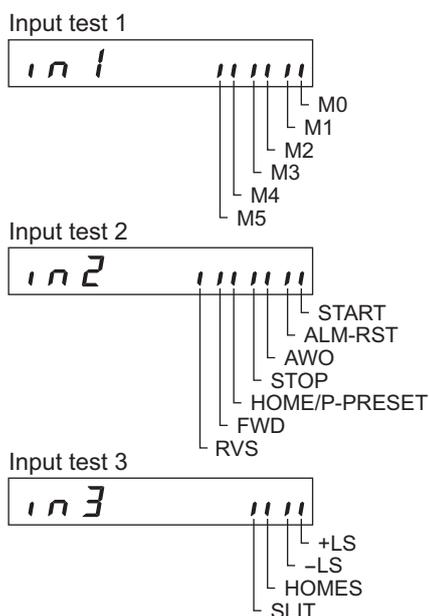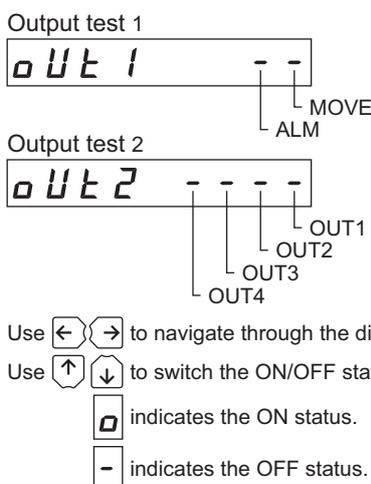
● **Input signals**

Input test 1

M0
M1
M2
M3
M4
M5

Input test 2

START
ALM-RST
AWO
STOP
HOME/P-PRESET
FWD
RVS

Input test 3

+LS
–LS
HOMES
SLIT

● **Output signals**

Output test 1

MOVE
ALM

Output test 2

OUT1
OUT2
OUT3
OUT4

Use ← → to navigate through the digits.
Use ↑ ↓ to switch the ON/OFF status.

◻ indicates the ON status.

– indicates the OFF status.

9-4 JOG operation

You can operate the motor using the keys on the **OPX-2A**.

Top screen of
JOG operation [SET]   Operation is in
                              progress

`JoG` ←--→ `- 123456`

[MODE ESC]
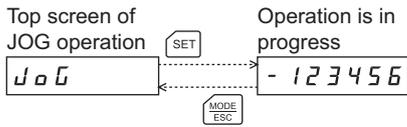
Pressing the【↑】key once causes the motor to rotate one step in the positive direction. Pressing and holding the key causes the motor to rotate continuously in the positive direction.
Pressing the【↓】key once causes the motor to rotate one step in the negative direction. Pressing and holding the key causes the motor to rotate continuously in the negative direction.
The operating speed corresponds to the value set in the "Jog operating speed" parameter [APP-2-06].
Take note that when the value set in the "Jog starting speed" parameter [APP-2-08] is greater than the value set in the "Jog operating speed" parameter [APP-2-06], the Jog starting speed will become effective.
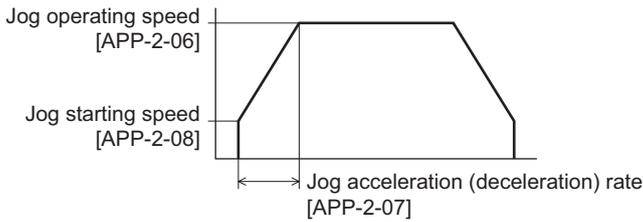
Jog operating speed
[APP-2-06]

Jog starting speed
[APP-2-08]

Jog acceleration (deceleration) rate
[APP-2-07]

Note During operation, the motor rotates at the specified operating speed while each applicable key is pressed. Before commencing the operation, consider the status of the equipment and condition of its surroundings to confirm thoroughly that motor rotation will not cause any dangerous situations.

9-5 Positioning operation

Select a desired operation data number and then press the【SET】key, and positioning operation will be performed.
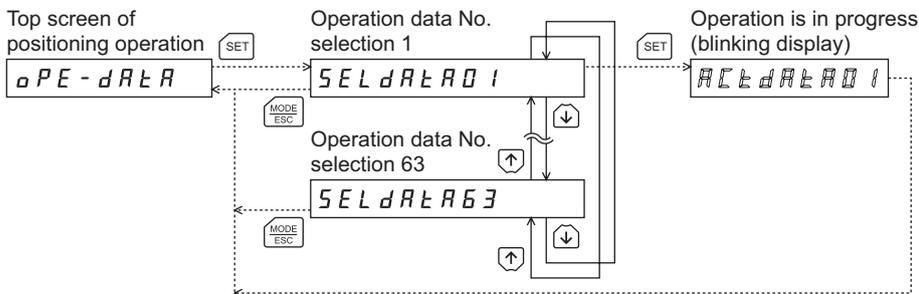
Top screen of
positioning operation [SET]   Operation data No.
                                  selection 1   [SET]   Operation is in progress
                                                               (blinking display)

`oPE-dAtA` ←--→ `SEL dAtA01` ←--→ `ACt dAtA01`

[MODE ESC]

Operation data No.
selection 63 [↑]

`SEL dAtA63`

[MODE ESC]   [↓]   [↑]

Note During operation, the motor rotates at the specified operating speed while each applicable key is pressed. Before commencing the operation, consider the status of the equipment and condition of its surroundings to confirm thoroughly that motor rotation will not cause any dangerous situations.

9-6 Return-to-home operation

You can perform a return-to-home operation.
The operating speed corresponds to the value set in the "operating speed of home-seeking" parameter [APP-3-02].
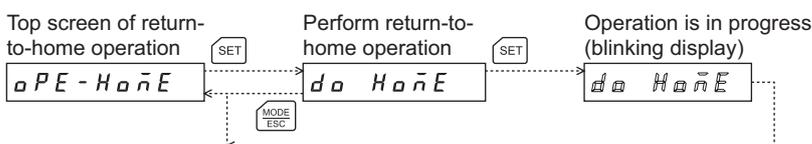
Top screen of return-
to-home operation [SET]   Perform return-to-
                              home operation [SET]   Operation is in progress
                                                      (blinking display)

`oPE-HoñE` ←--→ `do HoñE` ←--→ `do HoñE`

[MODE ESC]

> **Note** During operation, the motor rotates at the specified operating speed while each applicable key is pressed. Before commencing the operation, consider the status of the equipment and condition of its surroundings to confirm thoroughly that motor rotation will not cause any dangerous situations.

9-7 Presetting the position

In this operation, the command position is preset by rewriting the value in the "preset position" parameter [APP-0-21].
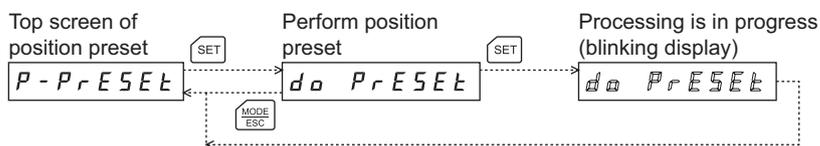
> **Note** If operations are limited by the edit lock function, the preset function cannot be performed.

9-8 Presetting the encoder counter

In this operation, the encoder counter is preset by rewriting the value in the "encoder counter preset value" parameter [APP-0-26].
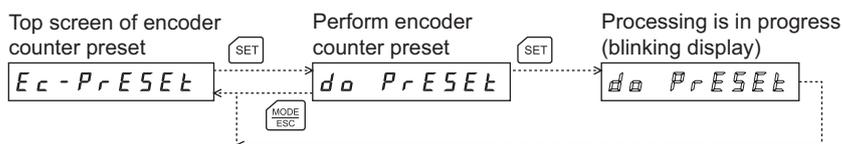
> **Note** If operations are limited by the edit lock function, the preset function cannot be performed.

9-9 Teaching

You can operate the motor using the keys on the **OPX-2A** and reflect the attained position in the operation data.
The absolute mode will be automatically selected as the operation mode of any position data set by teaching.
The operating speed, acceleration/deceleration rate and starting speed of teaching are the same as the corresponding settings applicable to JOG operation.
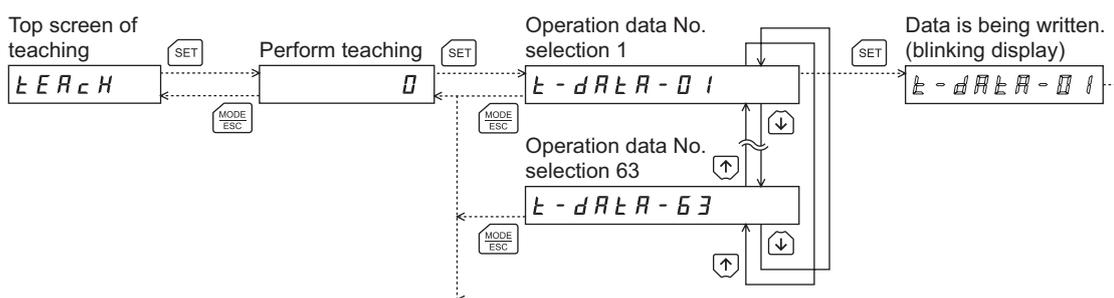
> **Note**
> - During operation, the motor rotates at the specified operating speed while each applicable key is pressed. Before commencing the operation, consider the status of the equipment and condition of its surroundings to confirm thoroughly that motor rotation will not cause any dangerous situations.
> - If operations are limited by the edit lock function, the teaching cannot be performed.

10   Copy mode

The **OPX-2A** has four data banks, and operation data and parameters can be saved in each of these data banks. Since an non-volatile memory is used as the data memory element, stored data will be retained even after the power is turned off.

10-1   Overview of the copy mode

● **Download**

Copy data saved in the **OPX-2A** to the driver.

● **Upload**

Copy data saved in the driver to the **OPX-2A**.

● **Verification**

Verify data in the **OPX-2A** against the corresponding data in the driver.

● **Initializing driver data**

Revert data saved in the driver to their initial values.

10-2   Operation in the copy mode

1. Use the【MODE/ESC】key to select the copy mode.

2. Press the【SET】key in the top screen of the copy mode.

3. Use the【↑】【↓】keys to select the item you want to perform.
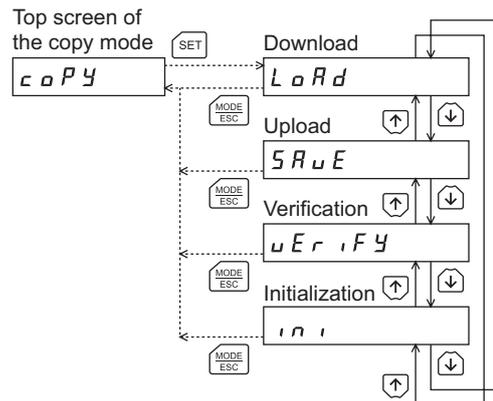
● **What happens when the【SET】key is pressed while the motor is operating**

While the motor is operating, you cannot move to any lower level from the top screen of the copy mode. Pressing the【SET】key will generate an error, and "oPE-Err" will be shown.
Be sure to stop the motor operation before pressing the【SET】key.
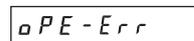
● **What happens when the【SET】key is pressed while the edit lock is enabled**

While the edit lock is enabled, you cannot move to any lower level from the top screen of the copy mode. Pressing the【SET】key will generate an error, and "LocK-Err" will be shown.
Be sure to cancel the edit lock before pressing the【SET】key. Refer to p.7 for the procedure to cancel the edit lock.
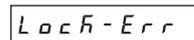
Note
- Stop the motor operation before changing to the copy mode.
- When you move from the top screen of the copy mode to a lower level, following inputs will be disabled.
  START input, FWD input, RVS input, HOME-P/PRESET input and M0 to M5 inputs.
- If the【SET】key on the **OPX-2A** is pressed while internal processing is being performed, the top screen will not change to any of its sub-screens and "mEm-bUSY" will be shown on the display. Be sure to wait until all internal processing is completed, before pressing the【SET】key.

10-3   Downloading to the driver

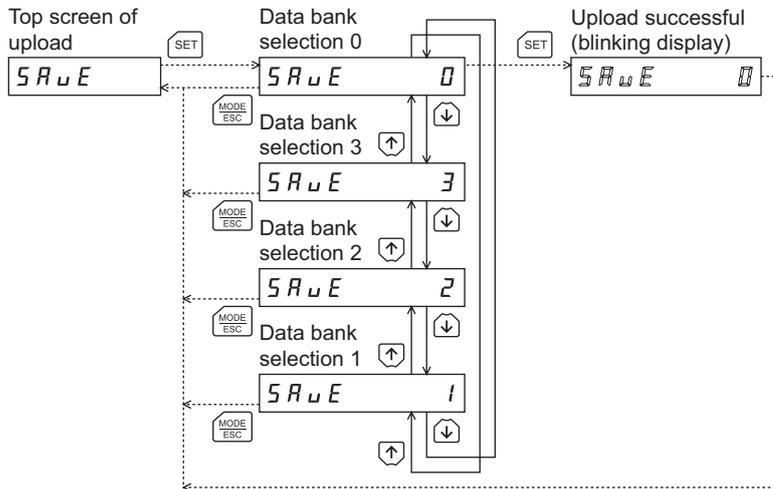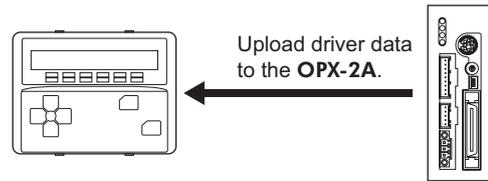In this operation, data in the specified data bank number are downloaded to the driver.
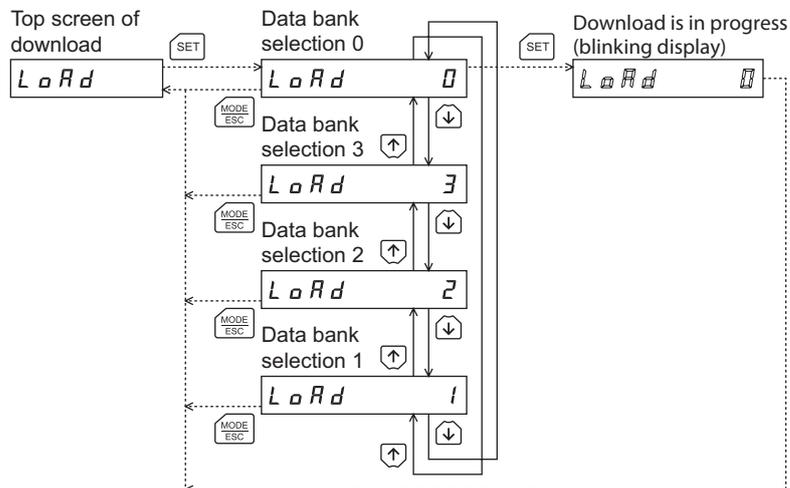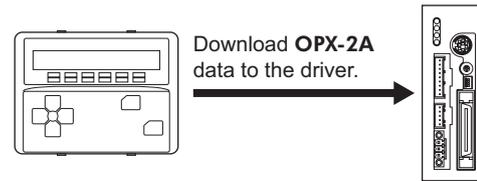
Download **OPX-2A** data to the driver.

Top screen of download   [SET]   Data bank selection 0   Download is in progress (blinking display)

| L o A d | | L o A d   0 | [SET] | L o A d   0 |

[MODE ESC] Data bank selection 3

| L o A d   3 |

[MODE ESC] Data bank selection 2

| L o A d   2 |

[MODE ESC] Data bank selection 1

| L o A d   1 |

[MODE ESC]

Note
- System parameters that have been changed will become effective after the power is cycled. If the system parameters have been changed as a result of the download, cycle the driver power.
- Do not turn off the driver power while the download is still in progress (=while the display is blinking). Doing so may damage the data.

If a download error occurs, a code indicating the nature of the error will blink on the display.
Download will not be performed and the display will return to the top screen of download.

Blinking display	Description	Action
P r o d - E r r	The product series of the driver to which data is downloaded is wrong.	• Check the product series of the driver. • Check the data bank number on the **OPX-2A**.
H E A d - E r r b c c - E r r	An error occurred while data was being downloaded.	Perform download again. If the same error occurs, the data saved in the **OPX-2A** may be damaged. Upload the applicable data to set the **OPX-2A** data again.
n o - d A t A	The specified data bank number does not contain data.	Check the data bank number.

10-4 Uploading to the OPX-2A

In this operation, data saved in the driver is uploaded to the specified data bank number.

Upload driver data to the **OPX-2A**.

Note Do not turn off the driver power while the upload is still in progress (=while the display is blinking). Doing so may damage the data.

10-5 Verifying data

In this operation, data in the specified data bank number are verified against the corresponding data saved in the driver. If the verification finds that the two sets of data match, "Good" will be shown. If the two do not match, "Error" will be shown.

Copy mode
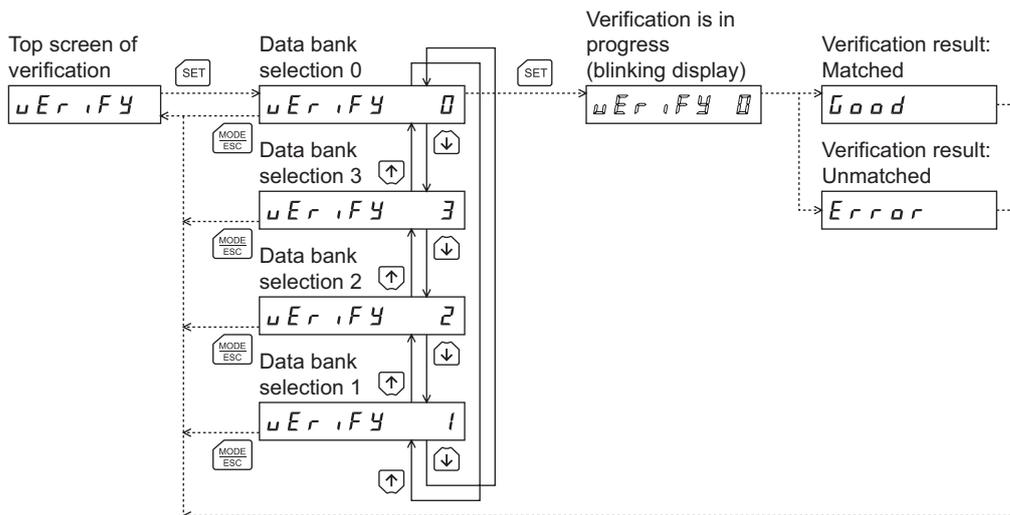
If a verification error occurs, a code indicating the nature of the error will blink on the display.
Verification will not be performed and the display will return to the top screen of verification.

Blinking display	Description	Action
$Prod-Err$	The product series of the driver against which data is verified is wrong.	• Check the product series of the driver. • Check the data bank number on the **OPX-2A**.
$HEAd-Err$ $bcc-Err$	An error occurred while data was being verified.	Perform verification again. If the same error occurs, the data saved in the **OPX-2A** may be damaged. Upload the applicable data to set the **OPX-2A** data again.
$no-dAtA$	The specified data bank number does not contain data.	Check the data bank number.

10-6   Initializing driver data

In this operation, data saved in the driver are reverted to their initial values.
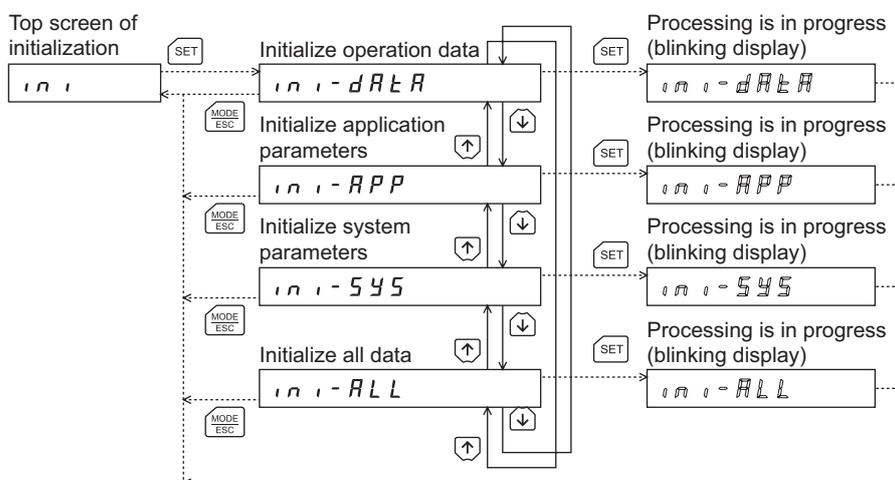
Note • System parameters that have been changed will become effective after the power is cycled. If the system parameters have been changed as a result of the initialization, cycle the driver power.
• Do not turn off the driver power while the initialization is still in progress (=while the display is blinking). Doing so may damage the data.

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