Oriental motor

HM-60219-2

Data Setter OPX-2A

AR Series FLEX

Built-in Controller Type

OPERATING MANUAL

Thank you for purchasing an Oriental Motor product.
This Operating 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.

Table of contents

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

- To dispose of the data setter, disassemble it into parts and components as much as possible and dispose of individual parts/components as industrial waste.

2 Introduction

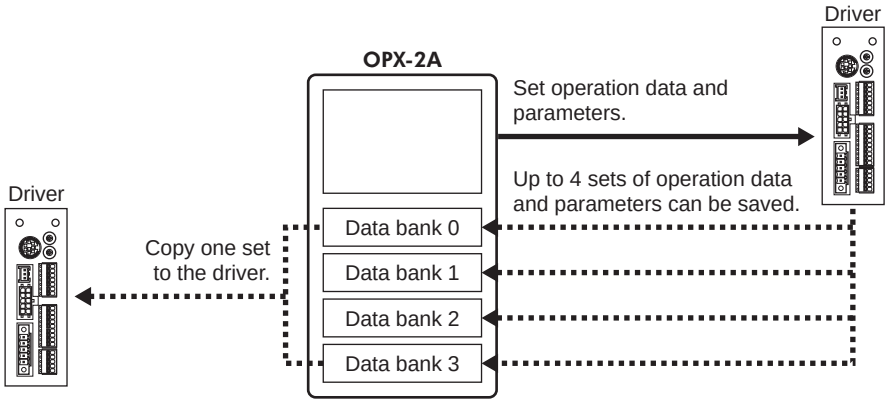
Only qualified personnel should work with the product. Use the product correctly after thoroughly reading the section “1 Safety precautions” on p.3.
The product described in this manual has been designed and manufactured for use in general industrial machinery, and must not be used for any other purpose. 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 "**AR** 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)

■ Hazardous substances

RoHS (Directive 2002/95/EC 27Jan.2003) compliant

3 Preparation

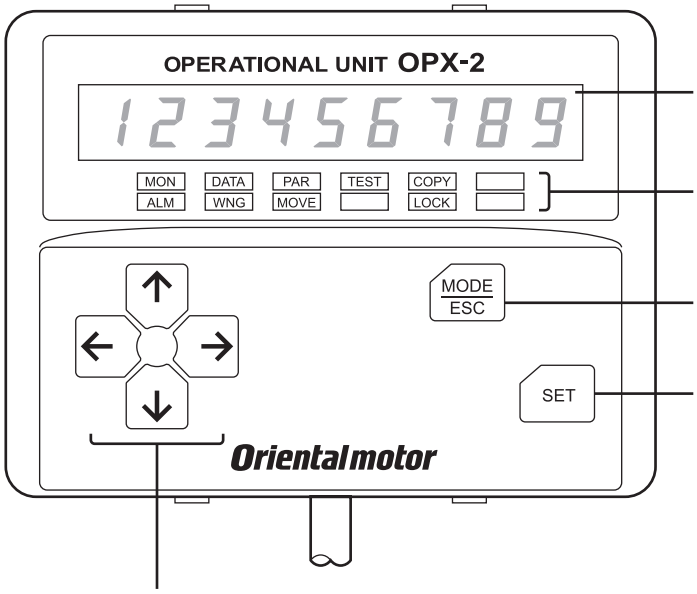
This chapter explains the items you should know before using the **OPX-2A**.

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
- OPERATING MANUAL (CD-ROM).....1 pc.
- 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.

Use this button to change the operation mode or move to the upper level.

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

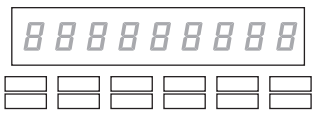
Use these buttons to change the selected item or set data and parameters.

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

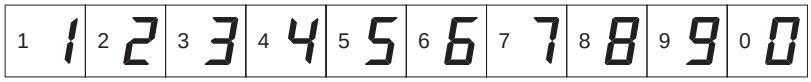
In this manual, keys are denoted by symbols, such as 【MODE/ESC】【SET】【↑】【↓】【←】【→】.
In figures, a simplified illustration of the display and LED indicators is used, as shown below.



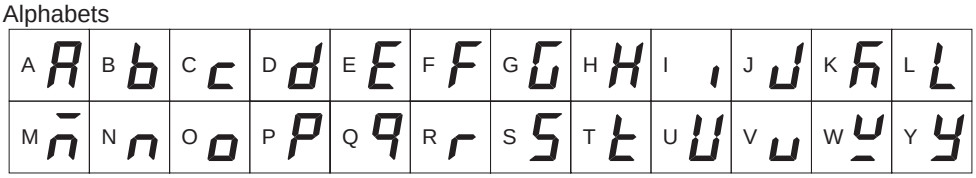
3.3 How to read the display

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

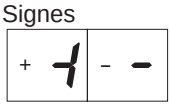
• Numbers



• Alphabets

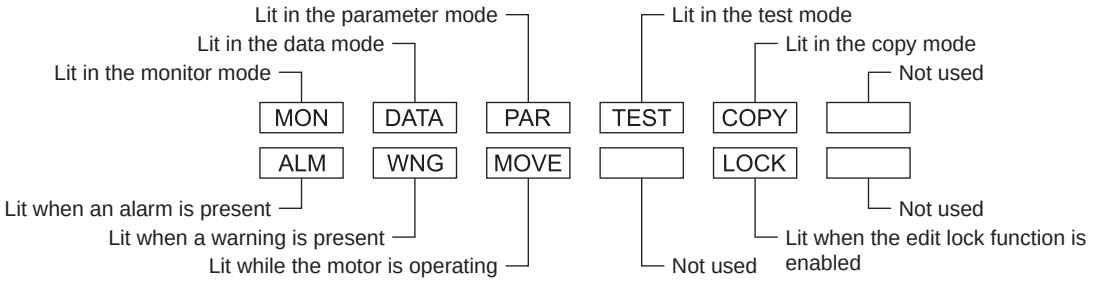


• Signes



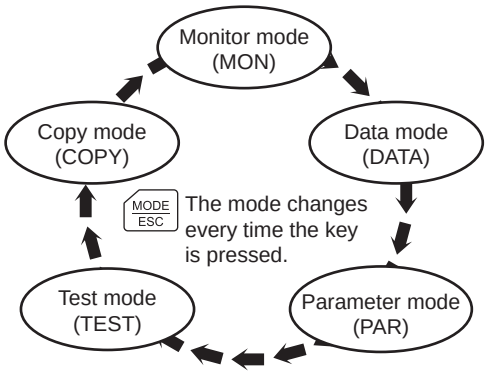
3.4 How to read the LED indicators

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.



3.5 Types of operation modes

The **OPX-2A** has multiple operation modes. The operation mode will change every time the 【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.

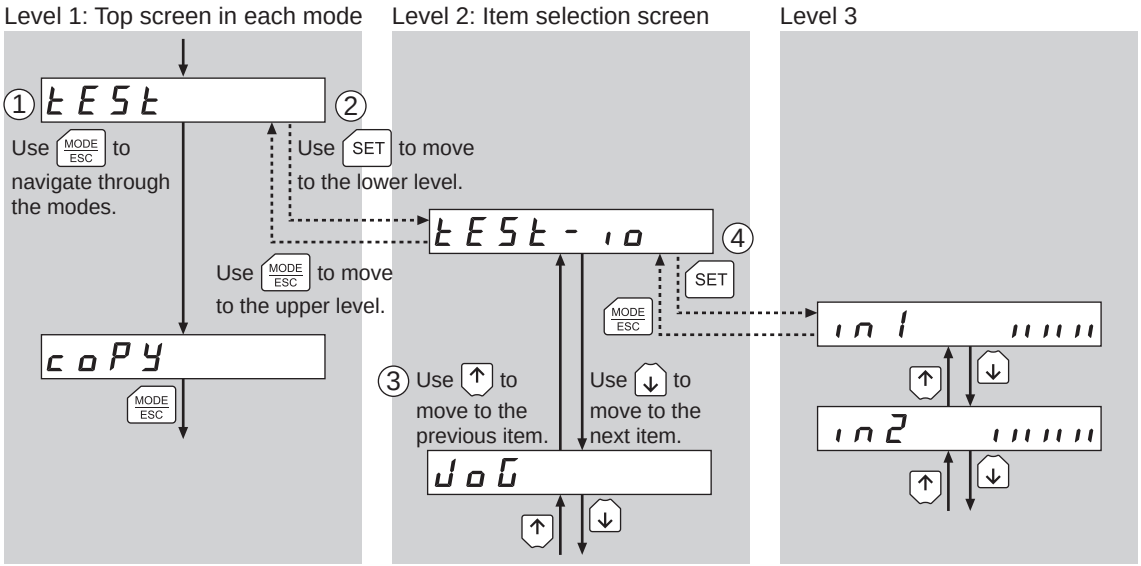


3.6 Basic operations of the OPX-2A

Use the six keys 【MODE/ESC】【SET】【↑】【↓】【←】【→】 to set data and operate the motor.

■ Operation flow

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



1. Use the 【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 【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 【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.

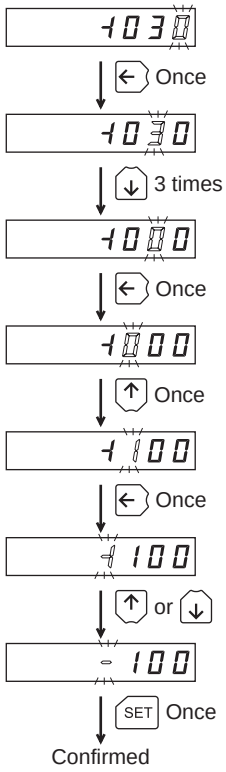
■ How to input values

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.
2. Press the【↓】key three times to change the value to “0”.
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.
4. Press the【↑】key to change the value to “1”.
5. Next, change the sign.
   Press the【←】key once to move to the sign digit you want to edit.
6. Press the【↑】or【↓】key once to change the sign to “−”.
7. After all digits have been changed, press the【SET】key to confirm the value.
   All digits comprising the value blink for approx. 2 seconds.



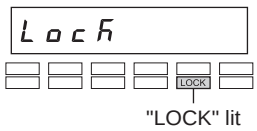
Note If the value you have input is outside the setting range, “Error” will be displayed for 1 second. If this error display appears, input a different value that falls within the setting range.

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【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.



- Canceling the edit lock function

Again in the top screen of each operation mode, press the【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.

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

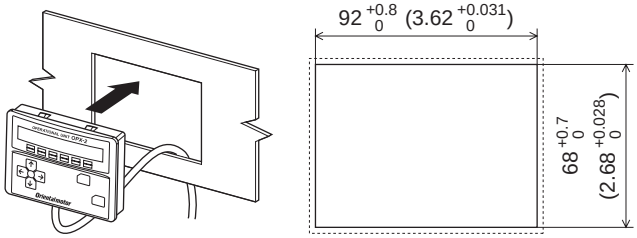
The **OPX-2A** is designed and manufactured for installation in equipment. Install it in a well-ventilated location that provides easy access for inspection. The location must also satisfy the following conditions:

- 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

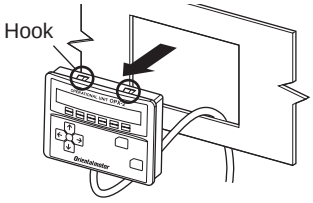
Using a metal plate of 1 to 3 mm (0.04 to 0.12 in.) in thickness, insert the **OPX-2A** into the mounting hole from the front side and securely affix the **OPX-2A**.

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



Removing method

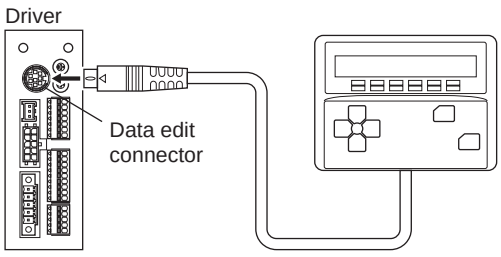
Press all of the four hooks provided on top and bottom of the **OPX-2A**. In this condition, press the **OPX-2A** forward to release.



4.3 Connecting to the driver

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

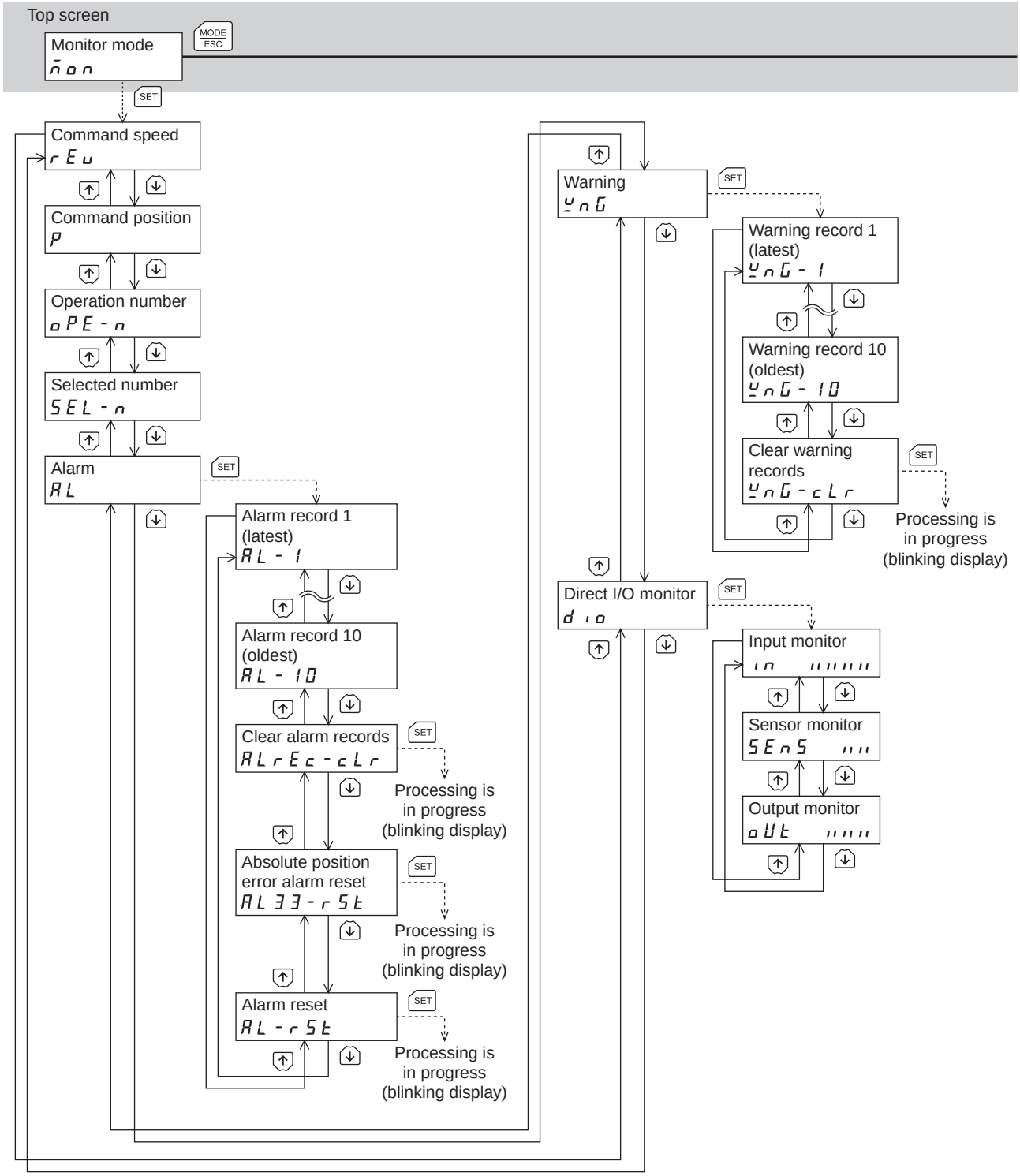
∗ Illustration shows ARD-KD.



Note

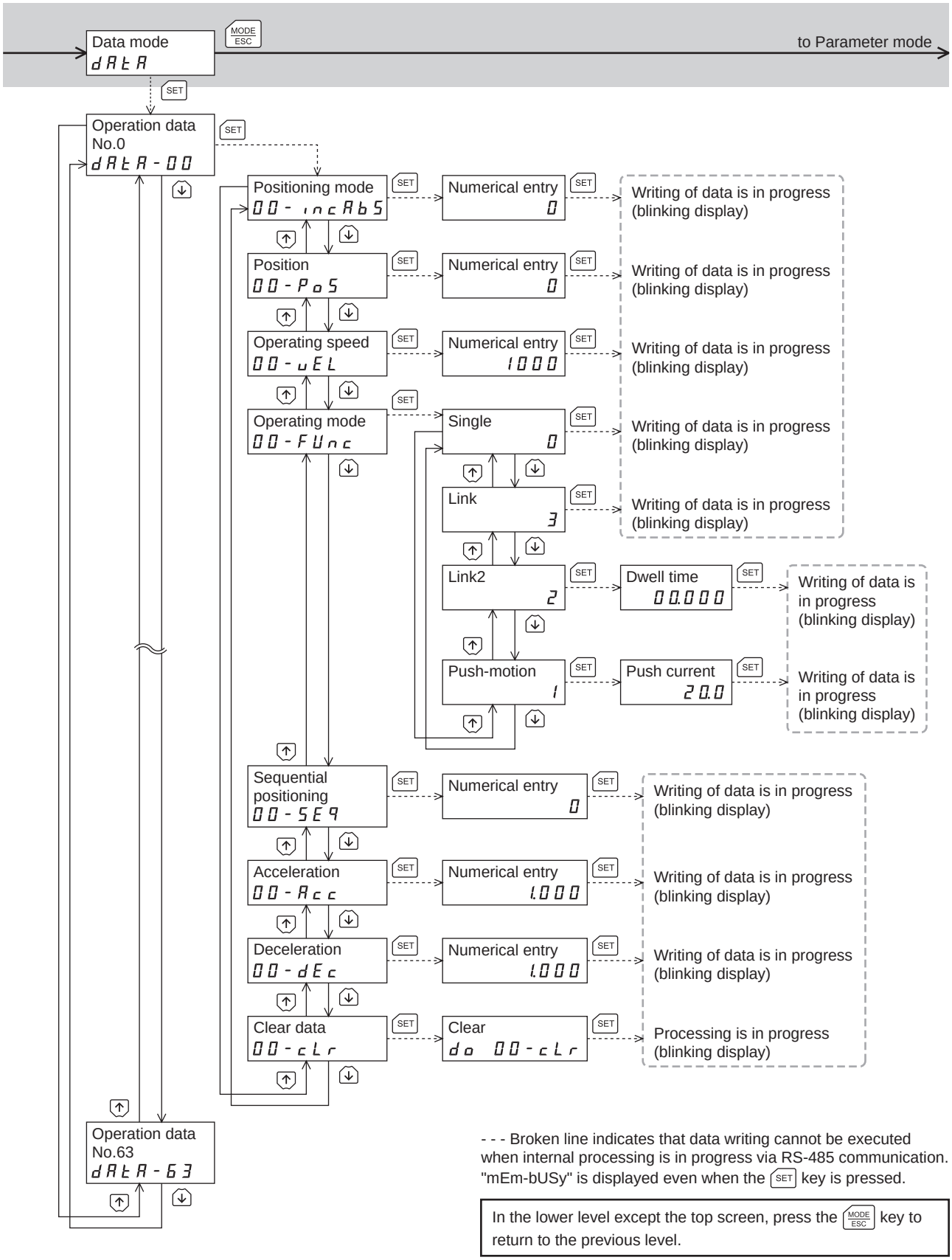
- When operation data and parameters are set on the **OPX-2A**, they will be stored in the driver. Once stored in the driver, the data will not be cleared even after the **OPX-2A** is disconnected from the driver.
- Turning on the power to the driver will also turn on the power to the **OPX-2A**. Turning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



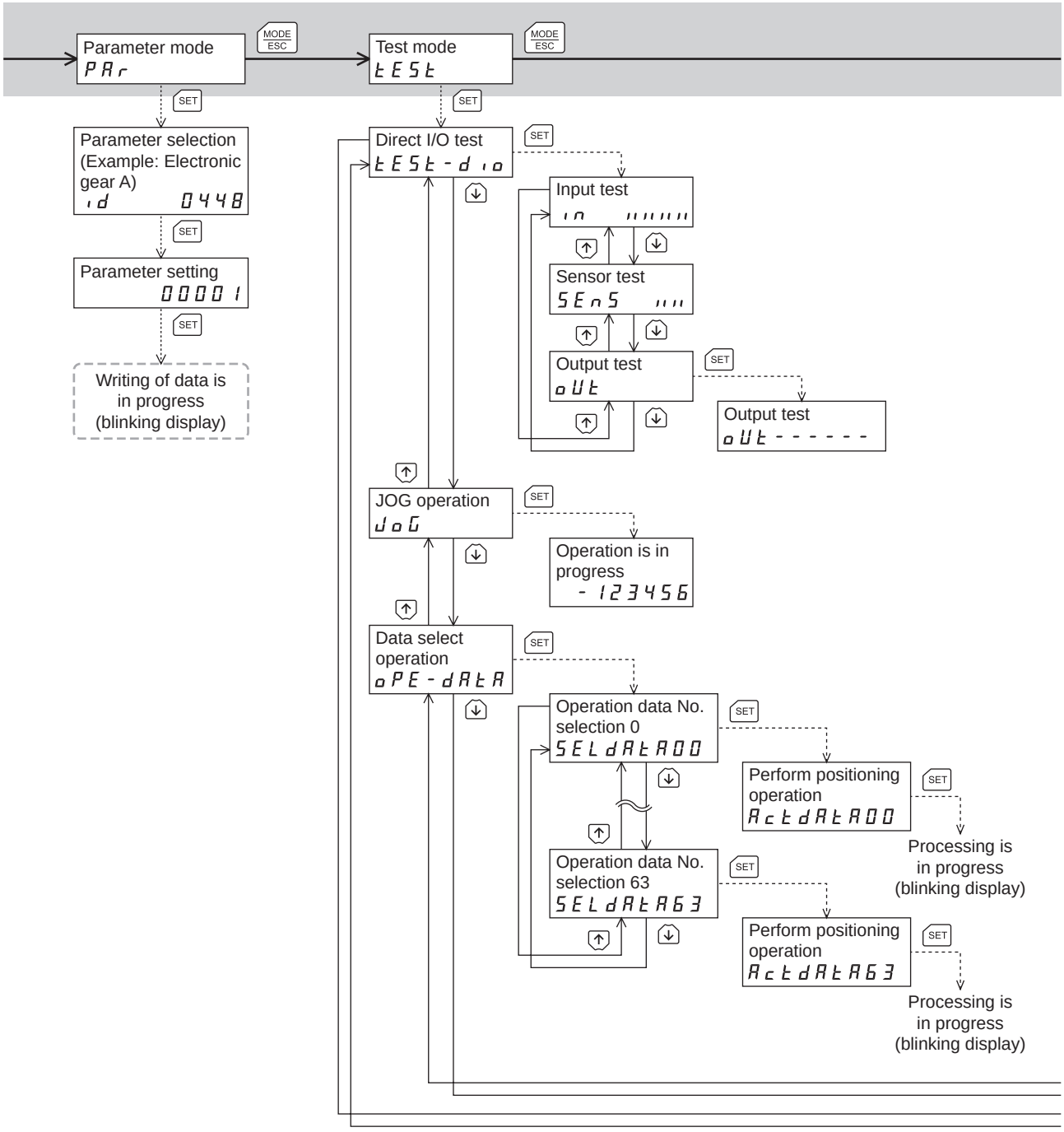
Note

- There are the following restrictions while the edit lock function is effective.
  · Data mode, parameter mode: Although they are displayed on the screen, they are unable to operate.
  · Clearing the alarm and warning records, clear data, position preset, teaching, copy mode: They are not displayed on the screen.
- When the HMI input is OFF, you can operate all functions of the monitor mode, uploading and verification of the copy mode, and viewing of the parameter mode.

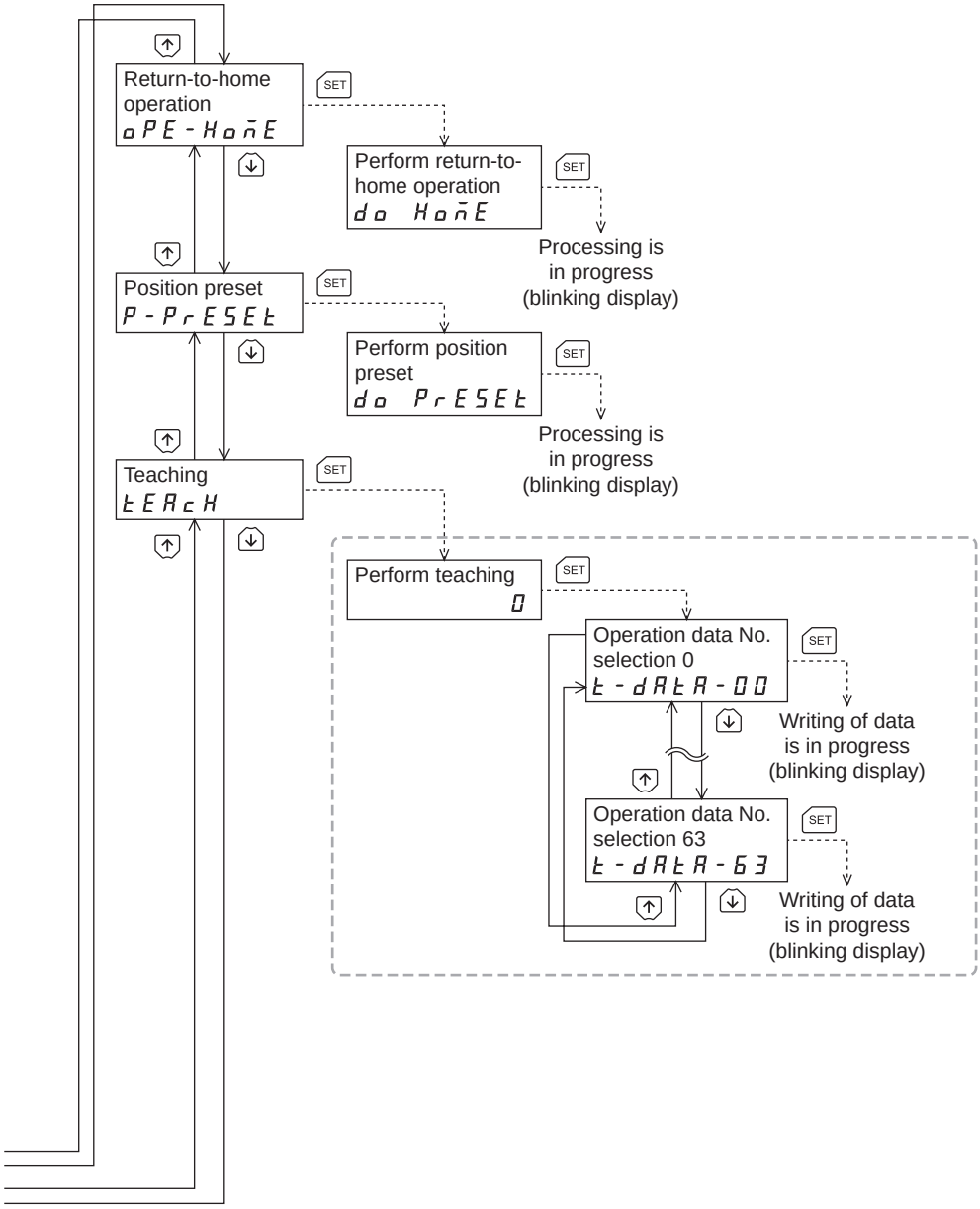


- - - Broken line indicates that data writing cannot be executed when internal processing is in progress via RS-485 communication. "mEm-bUSy" is displayed even when the SET key is pressed.

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


Parameter mode
PAr
MODE ESC
Test mode
tESt
MODE ESC
SET
Parameter selection (Example: Electronic gear A)
id 0448
SET
Parameter setting
0000 1
SET
Writing of data is in progress (blinking display)
SET
Direct I/O test
tESt-dio
Input test
in
Sensor test
SEnS
Output test
oUt
SET
Output test
oUt------
JOG operation
JoG
SET
Operation is in progress
-123456
Data select operation
oPE-dAtA
SET
Operation data No. selection 0
SELdAtA00
SET
Perform positioning operation
ActdAtA00
SET
Processing is in progress (blinking display)
Operation data No. selection 63
SELdAtA63
SET
Perform positioning operation
ActdAtA63
SET
Processing is in progress (blinking display)

to Copy mode



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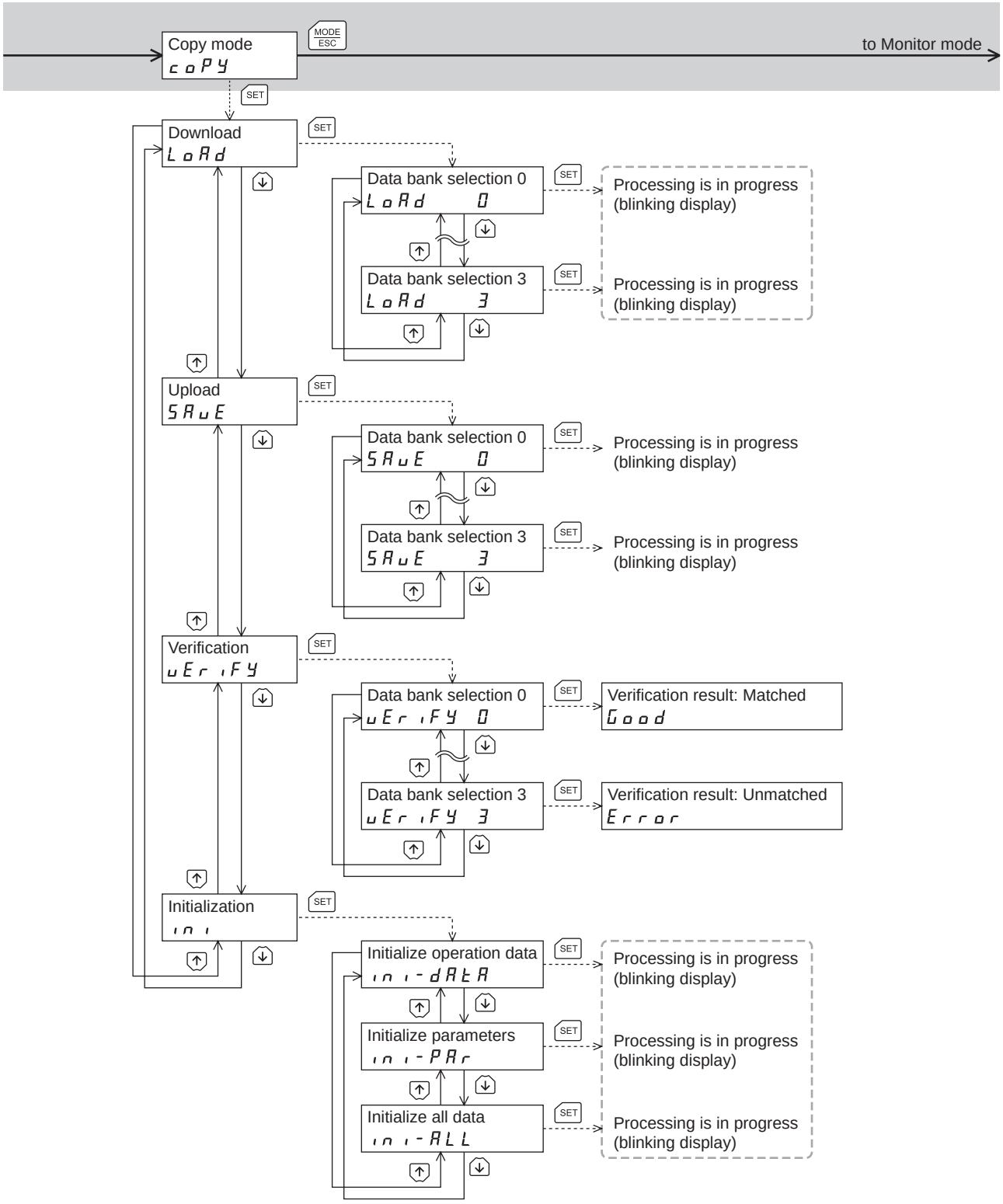
In the lower level except the top screen, press the MODE ESC key to return to the previous level.



- - - Broken line indicates that data writing cannot be executed when internal processing is in progress via RS-485 communication. "mEm-bUSy" is displayed even when the SET key is pressed.

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 motor speed, command position, operation data number corresponding to the current operation, and operation data number currently selected in real time.

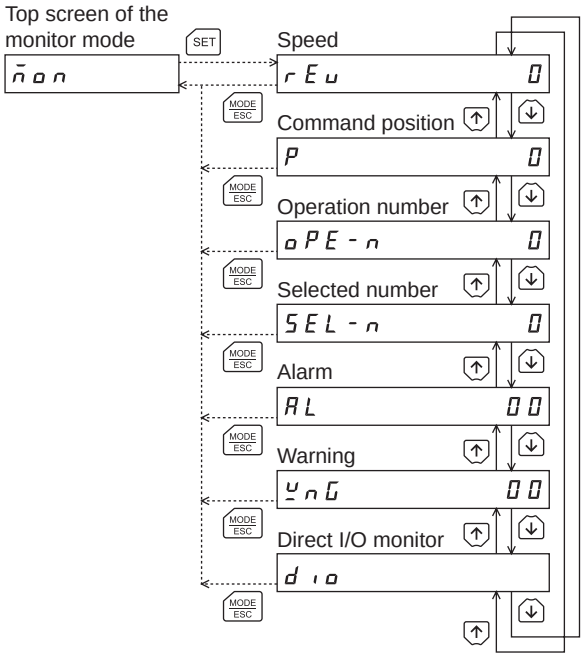
- Checking alarms/warnings, clearing alarm/warning records, and resetting alarms
  - If an alarm or warning generates, a corresponding alarm code or warning code will be displayed. You can check the code to identify the details of the alarm/warning.
  - Up to ten most recent alarms/warnings can be displayed, 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

■ Motor speed

You can check the command speed of the motor (unit: r/min).
While the motor is rotating in the CCW 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 [ID: 480].

■ 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.

■ Operation number

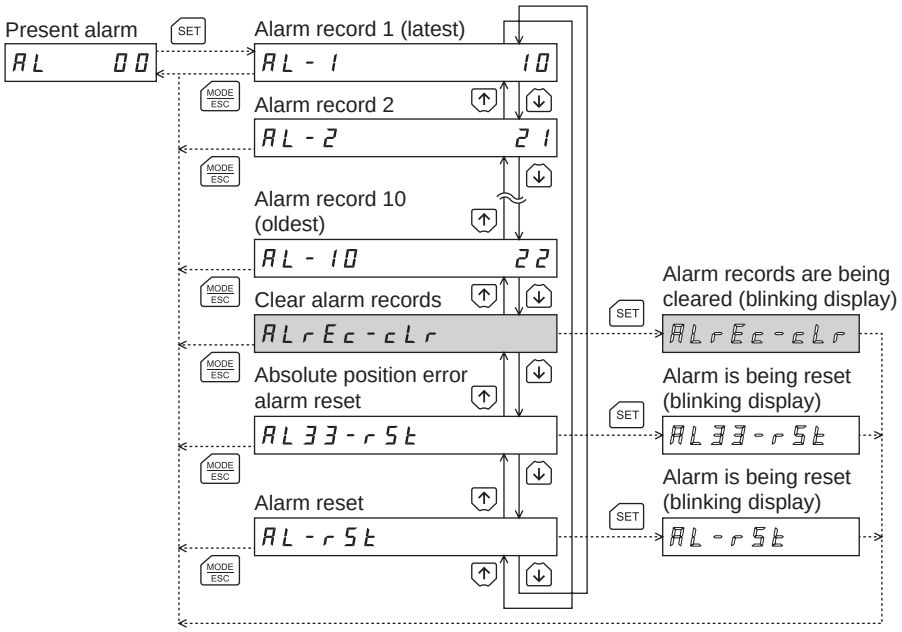
You can check the operation data number corresponding to the data used in the current positioning operation.

■ 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
10	Excessive position deviation	Possible	4
12	Excessive position deviation during current OFF		
20	Overcurrent*1	Not possible	5
21	Main circuit overheat	Possible	2
22	Overvoltage	ARD-KD: Possible ARD-AD, ARD-CD: Not possible	3
23	Main power off*1	Possible	
25	Undervoltage		
27	Backup battery undervoltage		7
28	Sensor error	Not possible	8
29	CPU peripheral circuit error		9
2D	Main circuit output error *1		5
30	Overload	Possible	2
31	Overspeed		
33	Absolute position error	Possible*2	7
34	Command pulse error	Possible	2
41	EEPROM error	Not possible	9
42	Initial sensor error		8
43	Initial rotor rotation error		
45	Motor combination error		
4A	Return-to-home incomplete	Possible	7
51	Regeneration unit overheat *1	Not possible	2
60	±LS both sides active	Possible	7
61	Reverse limit sensor connection		
62	Home seeking error		
63	No HOMES		
64	TIM, Z, SLIT input error		
66	Overtravel		
67	Software overtravel		
6A	Home seeking offset error		
70	Invalid operation data		
71	Electronic gear setting error	Not possible	
72	Wrap setting error		
81	Network bus error	Possible	
83	Communication switch setting error	Not possible	
84	RS-485 communication error	Possible	
85	RS-485 communication timeout		
8E	Network converter error		
F0	CPU error	Not possible	Lit

∗1 ARD-AD and ARD-CD only.

∗2 This alarm cannot be released by the "alarm reset (AL-rSt)." Release the alarm by the "absolute position error alarm reset (AL33-rSt)."

- 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 to select the alarm reset screen.
3. Press the【SET】key.
   The alarm is reset.

- How to reset an absolute position error

1. While an alarm is displayed, press the【SET】key to move to the lower level.
2. Press the【↑】key twice to select the absolute position error alarm reset screen.
3. Press the【SET】key.
   The absolute position error 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.

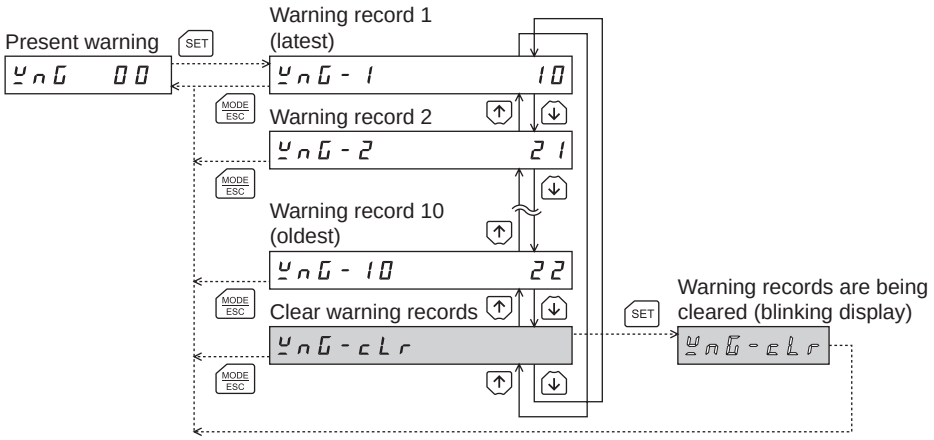
- How to clear all alarm records

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 three times 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
10	Excessive position deviation
12	Excessive position deviation during current OFF
21	Main circuit overheat
22	Overvoltage
25	Undervoltage
30	Overload

Code	Warning name
31	Overspeed
48	Battery connection error
71	Electronic gear setting error
72	Wrap setting error
84	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.

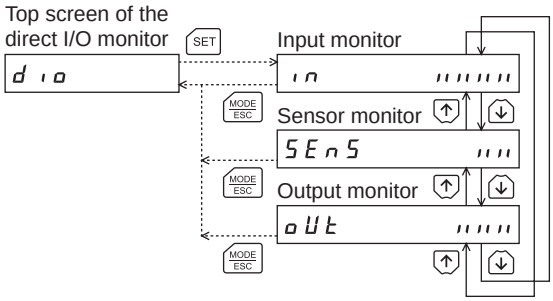
- How to clear all warning records

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.

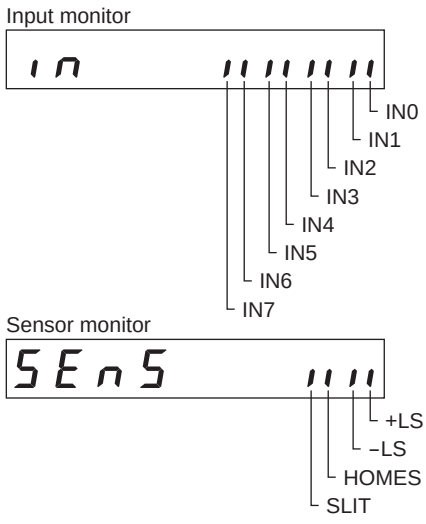
■ Direct I/O monitor

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

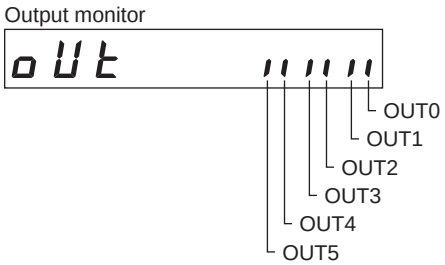


Each digit on the 7-segment LED display corresponds to a signal. If the signal is ON, the corresponding digit is lit. If the signal is OFF, the digit is unlit.

- Input signals



- Output signals



7 Data mode

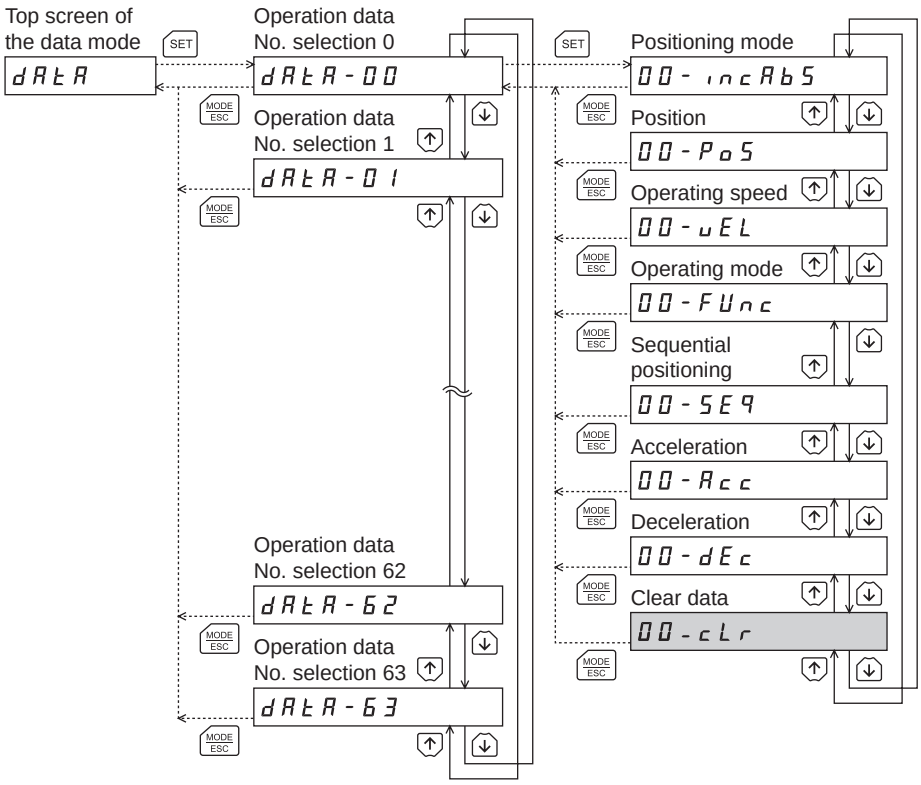
Up to 64 sets of motor operation data can be set. Once set, the operation data is stored in the driver. The data will not be lost even after the **OPX-2A** is disconnected from the driver.
Before setting operation data, read the "**AR** Series FLEX Built-in Controller type USER MANUAL" carefully to understand 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 or HMI input, operation data cannot be edited.
- Operation data can also be set by selecting the ID with the parameter mode.
- 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【SET】key is pressed while executing the internal processing via RS-485 communication, "mEm-bUSy" may be displayed. Check “5 Screen transitions” on p.10 when "mEm-bUSy" is displayed. Be sure to wait until all internal processing is completed, before pressing the【SET】key.

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.

7.2 Setting items

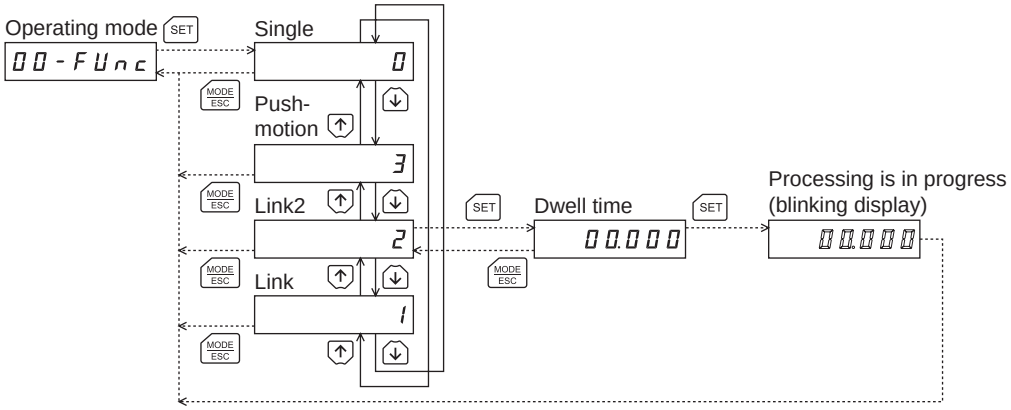
When a data has been changed, the new data will become effective after stopping the operation.

Setting item	Setting range	Initial value	Description
Positioning mode	0: Incremental mode 1: Absolute mode	0	Selects how to specify the position (travel amount) in positioning operation (absolute mode or incremental mode).
Position	−8,388,608 to +8,388,607 step	0	Sets the position (distance) for positioning operation.
Operating speed	1 to 1,000,000 Hz	1000	Sets the operating speed in positioning operation and continuous operation.
Operating mode	0: Single 1: Link 2: Link2 3: Push-motion	0	Sets perform positioning operation as single-motion, linked-motion or push-motion operation.
Sequential positioning	0: Disable 1: Enable	0	Sets enable or disable sequential positioning operation.
Acceleration	0.001 to 1000.000 (ms/kHz or s)	1.000	Sets the acceleration rate in positioning operation and continuous operation.*
Deceleration			Sets the deceleration rate in positioning operation and continuous operation.*
Push current	0.0 to 50.0%	20.0	Sets the current value of push-motion operation.
Dwell time	0.000 to 50.000 s	0.000	Sets the dwell time to be used in linked-motion operation 2.

* This item is effective when the “acceleration (deceleration) rate type” parameter [ID: 326] is set to “separate”. If this parameter is set to “common”, the values of the “common acceleration rate” [ID: 320] and “common deceleration rate” [ID: 321] parameters will be used.

■ 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.



7.3 Setting example

This section explains how to change the the positioning mode and position of the operation data No.0.

- 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.

2. Press the【SET】key on the top screen of the data mode.
   The display changes to the operation data No.0 screen.

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

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

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

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.

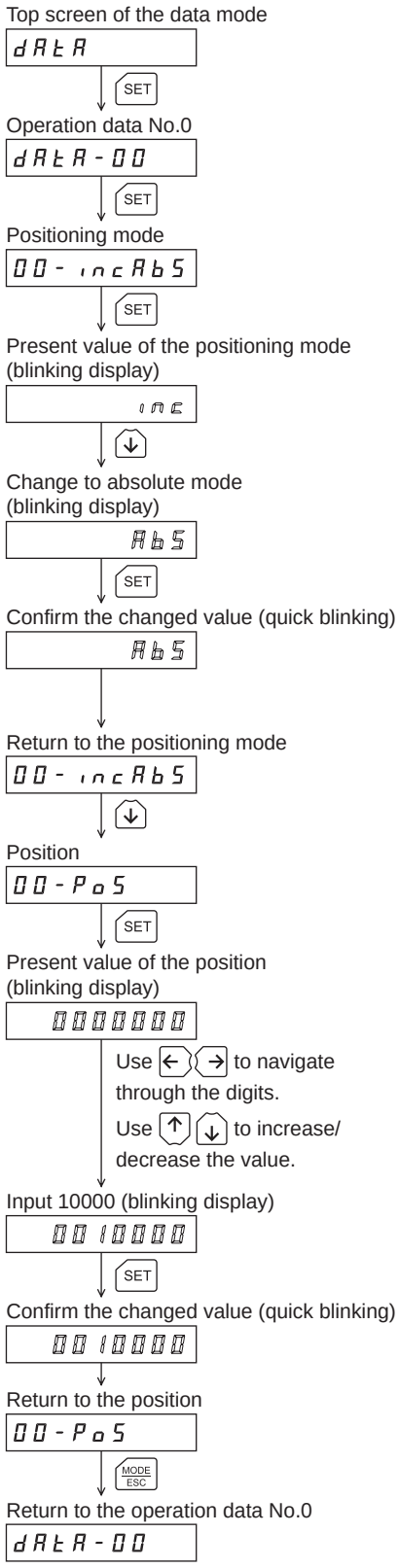
7. Press the【↓】key.
   The display changes to the position screen.

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

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

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.

11. Press the【MODE/ESC】key.
    The display returns to the operation data No.0 screen.



7.4 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.

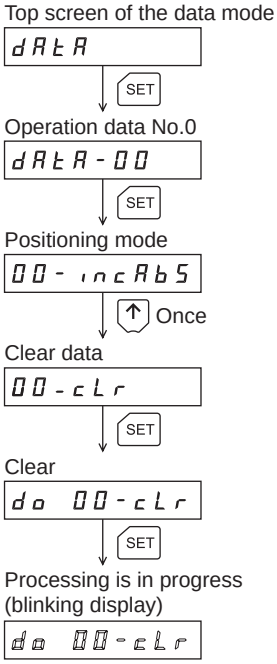
2. Press the【SET】key on the top screen of the data mode.
   The display changes to the operation data No.0 screen.

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

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

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

6. Press the【SET】key.
   The display blinks and the operation data No.0 is cleared.



7.5 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.14, 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 "**AR** Series FLEX Built-in Controller type USER MANUAL" 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 or HMI input, parameters cannot be edited.
- 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【SET】key is pressed while executing the internal processing via RS-485 communication, "mEm-bUSy" may be displayed. Check “5 Screen transitions” on p.10 when "mEm-bUSy" is displayed. Be sure to wait until all internal processing is completed, before pressing the【SET】key.
- If a nonexistent parameter ID is entered, "id-Error" will be displayed for 1 second. Check the ID and enter the correct one.

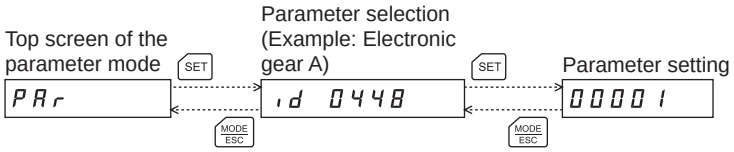
■ Timing for the setting value to become effective

When a parameter is changed, the timing for the new value to become effective varies depending on the parameters, which are the following four types.

- Effective immediately
  Executes the recalculation and setup immediately when writing the parameter.
- Effective after stopping the operation
  Executes the recalculation and setup after stopping the operation.
- Effective after executing the configuration
  Executes the recalculation and setup after executing the configuration.
- Effective after turning the power ON again
  Executes the recalculation and setup after turning the power ON again.

8.1 Operation in the parameter mode

1. Use the【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 enter the parameter ID.
4. Press the【SET】key.
   The display changes to the parameter setting screen.
5. Use the【↑】【↓】【←】【→】keys to enter the value.



8.2 Setting example

This section explains how to assign the TIM output to the OUT1 output.

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

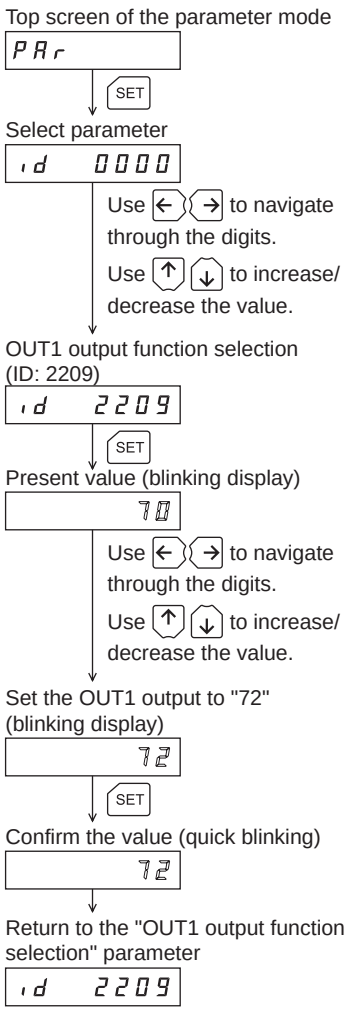
2. Press the【SET】key on the top screen of the parameter mode.

3. Use the【↑】【↓】【←】【→】keys to enter [ID: 2209] in the "OUT1 output function selection" parameter.

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

5. Use the【↑】【↓】【←】【→】keys to enter “72”.
   “72” indicates the TIM output.

6. 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.



8.3 Parameter list

There is an unique ID in each parameter. With the **OPX-2A**, set the parameter selecting the ID.

■ Operation data

Operation data can also be set by selecting the data mode.
Executes the recalculation and setup after changing the operation data.

ID	Parameter name	Description	Setting range	Initial value
640 to 703	Positioning mode No.0 to Positioning mode No.63	Selects how to specify the position (travel amount) in positioning operation (absolute mode or incremental mode).	0: Incremental mode 1: Absolute mode	0
512 to 575	Position No.0 to Position No.63	Sets the position (distance) for positioning operation.	−8,388,608 to +8,388,607 step	0
576 to 639	Operating speed No.0 to Operating speed No.63	Sets the operating speed in positioning operation and continuous operation.	0 to 1,000,000 Hz	1000
704 to 767	Operating mode No.0 to Operating mode No.63	Sets perform positioning operation as single-motion, linked-motion or push-motion operation.	0: Single 1: Link 2: Link2 3: Push-motion	0
960 to 1023	Sequential positioning No.0 to Sequential positioning No.63	Sets whether to enable or disable sequential positioning operation.	0: Disable 1: Enable	0
768 to 831	Acceleration No.0 to Acceleration No.63	Sets the acceleration rate in positioning operation and continuous operation.*	0.001 to 1000.000 (ms/kHz or s)	1.000
832 to 895	Deceleration No.0 to Deceleration No.63	Sets the deceleration rate in positioning operation and continuous operation.*		
896 to 959	Push current No.0 to Push current No.63	Sets the current value of push-motion operation.	0.0 to 50.0%	20.0
1024 to 1087	Dwell time No.0 to Dwell time No.63	Sets the dwell time to be used in linked-motion operation 2.	0.000 to 50.000 s	0.000

* This item is effective when the “acceleration (deceleration) rate type” parameter [ID: 326] is set to “separate”.
If this parameter is set to “common”, the values of the “common acceleration rate” [ID: 320] and “common deceleration rate” [ID: 321] parameters will be used.

■ Parameters

ID	Parameter name	Description	Setting range	Initial value	Effective*
256	STOP input action	Sets how the motor should stop when a STOP input is turned ON.	0: Immediate stop 1: Deceleration stop 2: Immediate stop & Current OFF 3: Deceleration stop & Current OFF	1	A
257	Hardware overtravel	Sets whether to enable or disable hardware overtravel detection using ±LS inputs.	0: Disable 1: Enable	1	
258	Overtravel action	Sets the motor action to take place upon the occurrence of overtravel.	0: Immediate stop 1: Deceleration stop	0	
259	Positioning completion signal range	Sets the output range of the END signal (the motor operation converges within this angular range).	0.0 to 18.0°	1.8	
260	Positioning completion signal offset	Sets the offset for the END signal (the offset for converging angular range).	−1.8 to 1.8°	0.0	
261	AREA1 positive direction position	Sets the position of AREA1 positive direction.	−8,388,608 to 8,388,607 step	0	
262	AREA1 negative direction position	Sets the position of AREA1 negative direction.			
263	AREA2 positive direction position	Sets the position of AREA2 positive direction.			
264	AREA2 negative direction position	Sets the position of AREA2 negative direction.			
265	AREA3 positive direction position	Sets the position of AREA3 positive direction.			
266	AREA3 negative direction position	Sets the position of AREA3 negative direction.			
267	Minimum ON time for MOVE output	Sets the minimum time during which the MOVE output remains ON	0 to 255 ms	0	
268	LS logic level	Sets the±LS input logic.	0: Normally open 1: Normally closed	0	C
269	HOMES logic level	Sets the HOMES input logic.			
270	SLIT logic level	Sets the SLIT input logic.			
288	RUN current	Sets the motor operating current based on the rated current being 100%.	0.0 to 100.0%	100.0	A
289	STOP current	Sets the motor standstill current as a percentage of the rated current, based on the rated current being 100%.	0.0 to 50.0%	50.0	
290	Position loop gain	Adjusts the motor response in reaction to the position deviation.	1 to 50	10	
291	Speed loop gain	Adjusts the motor response in reaction to the speed deviation.	10 to 200	180	
292	Speed loop integral time constant	Sets the decreases the deviation that cannot be adjusted with the speed loop gain.	10.0 to 200.0 ms	100.0	
293	Speed filter	Adjusts the motor response.	0 to 200 ms	1	B
294	Moving average time	Sets the time constant for the moving average filter.	1 to 200 ms	1	
320	Common acceleration	Sets the common acceleration (rate or time) in positioning operation and continuous operation.	0.001 to 1000.000 (ms/kHz or s)	1.000	
321	Common deceleration	Sest the common deceleration (rate or time) in positioning operation and continuous operation.			
322	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.	0 to 1,000,000 Hz	500	

* Indicates the timing for the data to become effective. (A: Effective immediately, B: Effective after stopping the operation, C: Effective after executing the configuration)

ID	Parameter name	Description	Setting range	Initial value	Effective*
323	JOG operation speed	Sets the operating speed for JOG operation.	1 to 1,000,000 Hz	1000	B
324	Acceleration/deceleration of JOG	Sets the acceleration/deceleration (rate or time) for JOG operation.	0.001 to 1000.000 (ms/kHz or s)	1.000	
325	JOG starting speed	Sets the starting speed for JOG operation.	0 to 1,000,000 Hz	500	
326	Acceleration/deceleration type	Sets whether to use the common acceleration/ deceleration or the acceleration/deceleration specified for the operation data.	0: Common 1: Separate	1	
327	Acceleration/deceleration unit	Sets the acceleration/deceleration unit.	0: ms/kHz 1: s	0	C
352	Home-seeking mode	Sets the mode for return-to-home operation.	0: 2-sensor mode 1: 3-sensor mode 2: Push mode	1	B
353	Operation speed of home-seeking	Sets the operating speed for return-to-home operation.	1 to 1,000,000 Hz	1000	
354	Acceleration/deceleration of home-seeking	Sets the acceleration/ deceleration (rate or time) for return-to-home operation.	0.001 to 1000.000 (ms/kHz or s)	1.000	
355	Starting speed of home-seeking	Sets the starting speed for return-to-home operation.	1 to 1,000,000 Hz	500	
356	Position offset of home-seeking	Sets the amount of offset from mechanical home.	−8,388,608 to 8,388,607 step	0	
357	Starting direction of home-seeking	Sets the starting direction for home detection.	0: Negative direction 1: Positive direction	1	
358	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	
359	TIM signal detection with home-seeking	Sets whether or not to concurrently use the TIM signal for return-to-home operation.			
360	Operation current of push-motion home-seeking	Sets the operating current for push-motion return-to-home operation based on the rated current being 100%.	0.0 to 100.0%	100.0	
384	Overload alarm	Sets the condition in which an overload alarm generates.	0.1 to 30.0 s	5.0	A
385	Overflow rotation alarm during current ON	Sets the condition that an excessive position deviation alarm generates when the motor is in a state of current ON.	0.01 to 300.00 rev	3.00	
388	Return-to-home incomplete alarm	Sets whether to enable or disable return-to-home incomplete alarm	0: Disable 1: Enable	0	C
416	Overheat warning	Sets the temperature at which a main circuit overheat warning generates.	40 to 85 °C (104 to 185 °F)	85	A
417	Overload warning	Sets the condition that an overload warning generates.	0.1 to 30.0 s	5.0	
418	Overspeed warning	Sets the condition that an overspeed warning generates.	1 to 5000 r/min	4500	
419	Overvoltage warning	Sets the voltage at which an overvoltage warning generates.	ARD-KD: 15.0 to 63.0 V	63.0	
			ARD-AD, ARD-CD: 120 to 450 V	435	
420	Undervoltage warning	Sets the voltage at which an undervoltage warning generates.	ARD-KD: 15.0 to 63.0 V	18.0	
			ARD-AD, ARD-CD: 120 to 280 V	120	
421	Overflow rotation warning during current ON	Setse the condition that an excessive position deviation warning generates when the motor is in a state of current ON.	0.01 to 300.00 rev	3.00	

* Indicates the timing for the data to become effective. (A: Effective immediately, B: Effective after stopping the operation, C: Effective after executing the configuration)

ID	Parameter name	Description	Setting range	Initial value	Effective*
448	Electronic gear A	Sets the denominator of electric gear.	1 to 65535	1	C
449	Electronic gear B	Sets the numerator of electric gear.			
450	Motor rotation direction	Sets the rotation direction of motor output shaft.	0: Positive direction =CCW 1: Positive direction =CW	1	
451	Software overtravel	Sets whether to enable or disable software overtravel detection using soft limits.	0: Disable 1: Enable	1	A
452	Positive software limit	Sets the value of soft limit in positive direction.	−8,388,608 to 8,388,607 step	8,388,607	
453	Negative software limit	Sets the value of soft limit in negative direction.		−8,388,608	
454	Preset position	Sets the preset position.		0	
455	Wrap setting	Sets whether to enable or disable wrap function.	0: Disable 1: Enable	0	C
456	Wrap setting range	Sets the wrap setting range.	1 to 8,388,607 step	1000	
480	Data setter speed display	Sets the display method of the speed monitor for the **OPX-2A**.	0: Signed 1: Absolute value	0	A
482	Absolute-position backup system	Sets whether to enable or disable absolute-position backup system.	0: Disable 1: Enable	0	C
2048	MS0 operation No. selection	Sets the operation data No. corresponding to MS0 to MS5 input.	0 to 63	0	B
2049	MS1 operation No. selection			1	
2050	MS2 operation No. selection			2	
2051	MS3 operation No. selection			3	
2052	MS4 operation No. selection			4	
2053	MS5 operation No. selection			5	
2054	HOME-P function selection	Sets the timing to output the HOME-P output.	0: Home output 1: Return-to-home complete output	0	A
2064	ARD-KD: Moving average	Sets whether to enable or disable moving average.	0: Disable 1: Enable	0	C
	ARD-AD, ARD-CD: Filter selection	Sets the filter function to adjust the motor response.	0: Speed filter 1: Moving average	0	
2065	Speed error gain 1	Adjusts vibration during operation.	0 to 500	45	A
2066	Speed error gain 2	Adjusts vibration during acceleration/ deceleration.			
2067	Control mode	Sets the control mode of the driver.	0: Normal mode 1: Current control mode	0	C
2068	Smooth driver	Sets whether to enable or disable smooth drive function.	0: Disable 1: Enable	1	
2080	Automatic return action	Sets whether to enable or disable automatic return operation.		0	
2081	Operation speed of automatic return	Sets the operating speed for automatic return operation.	1 to 1,000,000 Hz	1000	B
2082	Acceleration/deceleration of automatic return	Sets the acceleration/deceleration (rate or time) for automatic return operation.	0.001 to 1000.000 (ms/kHz or s)	1.000	
2083	Starting speed of automatic return	Sets the starting speed for automatic return operation.	0 to 1,000,000 Hz	500	
2084	JOG travel amount	Sets the travel amount for JOG operation.	1 to 8,388,607 step	1	

* Indicates the timing for the data to become effective. (A: Effective immediately, B: Effective after stopping the operation, C: Effective after executing the configuration)

ID	Parameter name	Description	Setting range	Initial value	Effective*
2112	Overflow rotation alarm during current OFF	Sets the condition that an excessive position deviation alarm generates when the motor is in a state of current OFF.	0.01 to 300.00 rev	100.00	A
2176	IN0 input function selection	Sets the function of input terminals IN0 to IN7.	See table on p.32.	3	C
2177	IN1 input function selection			4	
2178	IN2 input function selection			48	
2179	IN3 input function selection			49	
2180	IN4 input function selection			50	
2181	IN5 input function selection			16	
2182	IN6 input function selection			18	
2183	IN7 input function selection			24	
2192	IN0 input logic level setting	Sets the IN0 to IN7 input logic.	0: Normally open 1: Normally closed	0	
2193	IN1 input logic level setting				
2194	IN2 input logic level setting				
2195	IN3 input logic level setting				
2196	IN4 input logic level setting				
2197	IN5 input logic level setting				
2198	IN6 input logic level setting				
2199	IN7 input logic level setting				
2208	OUT0 output function selection	Sets the function of output terminals OUT0 to OUT5.	See table on p.32.	70	
2209	OUT1 output function selection			69	
2210	OUT2 output function selection			73	
2211	OUT3 output function selection			67	
2212	OUT4 output function selection			66	
2213	OUT5 output function selection			65	
2224	NET-IN0 input function selection	Sets the function of NET-IN0 to NET-IN6.	See table on p.32.	48	
2225	NET-IN1 input function selection			49	
2226	NET-IN2 input function selection			50	
2227	NET-IN3 input function selection			4	
2228	NET-IN4 input function selection			3	
2229	NET-IN5 input function selection			18	
2230	NET-IN6 input function selection			16	

* Indicates the timing for the data to become effective. (A: Effective immediately, C: Effective after executing the configuration)

ID	Parameter name	Description	Setting range	Initial value	Effective*
2231	NET-IN7 input function selection	Sets the function of NET-IN7 to NET-IN15.	See table on p.32.	0	
2232	NET-IN8 input function selection			8	
2233	NET-IN9 input function selection			9	
2234	NET-IN10 input function selection			10	
2235	NET-IN11 input function selection			5	
2236	NET-IN12 input function selection			6	
2237	NET-IN13 input function selection			7	
2238	NET-IN14 input function selection			1	
2239	NET-IN15 input function selection			2	
2240	NET-OUT0 output function selection	Sets the function of NET-OUT0 to NET-OUT15.	See table on p.32.	48	C
2241	NET-OUT1 output function selection			49	
2242	NET-OUT2 output function selection			50	
2243	NET-OUT3 output function selection			4	
2244	NET-OUT4 output function selection			70	
2245	NET-OUT5 output function selection			67	
2246	NET-OUT6 output function selection			66	
2247	NET-OUT7 output function selection			65	
2248	NET-OUT8 output function selection			80	
2249	NET-OUT9 output function selection			73	
2250	NET-OUT10 output function selection			74	
2251	NET-OUT11 output function selection			75	
2252	NET-OUT12 output function selection			72	
2253	NET-OUT13 output function selection			68	
2254	NET-OUT14 output function selection			69	
2255	NET-OUT15 output function selection			71	
2304	Communication timeout	Sets the condition in which a communication timeout occurs in RS-485 communication.	0: Not monitored 0 to 10000 ms	0	A
2305	Communication error alarm	Sets the condition in which a RS-485 communication error alarm generates.	1 to 10 times	3	
2563	Communication parity	Sets the parity of RS-485 communication.	0: None 1: Even number 2: Odd number	1	D
2564	Communication stop bit	Sets the stop bit of RS-485 communication.	0: 1 bit 1: 2 bit	0	
2565	Transmission waiting time	Sets the transmission waiting time of RS-485 communication.	0.0 to 1000.0 ms	10.0	

* Indicates the timing for the data to become effective. (A: Effective immediately, C: Effective after executing the configuration, D: Effective after turning the power ON again)

■ Setting range of function selection parameters

- IN input function selection parameters

0: Not used	8: MS0	18: STOP	35: R3	43: R11	51: M3
1: FWD	9: MS1	24: ALM-RST	36: R4	44: R12	52: M4
2: RVS	10: MS2	25: P-PRESET	37: R5	45: R13	53: M5
3: HOME	11: MS3	26: P-CLR	38: R6	46: R14	
4: START	12: MS4	27: HMI	39: R7	47: R15	
5: SSTART	13: MS5	32: R0	40: R8	48: M0	
6: +JOG	16: FREE	33: R1	41: R9	49: M1	
7: −JOG	17: C-ON	34: R2	42: R10	50: M2	

- OUT output function selection parameters

0: Not used	10: MS2_R	35: R3	45: R13	61: −LS_R	72: TIM
1: FWD_R	11: MS3_R	36: R4	46: R14	62: HOMES_R	73: AREA1
2: RVS_R	12: MS4_R	37: R5	47: R15	63: SLIT_R	74: AREA2
3: HOME_R	13: MS5_R	38: R6	48: M0_R	65: ALM	75: AREA3
4: START_R	16: FREE_R	39: R7	49: M1_R	66: WNG	80: S-BSY
5: SSTART_R	17: C-ON_R	40: R8	50: M2_R	67: READY	82: MPS*
6: +JOG_R	18: STOP_R	41: R9	51: M3_R	68: MOVE	
7: −JOG_R	32: R0	42: R10	52: M4_R	69: END	
8: MS0_R	33: R1	43: R11	53: M5_R	70: HOME-P	
9: MS1_R	34: R2	44: R12	60: +LS_R	71: TLC	

* ARD-AD and ARD-CD only.

- NET-IN input function selection parameters

0: Not used	7: −JOG	16: FREE	35: R3	42: R10	49: M1
1: FWD	8: MS0	17: C-ON	36: R4	43: R11	50: M2
2: RVS	9: MS1	18: STOP	37: R5	44: R12	51: M3
3: HOME	10: MS2	27: HMI	38: R6	45: R13	52: M4
4: START	11: MS3	32: R0	39: R7	46: R14	53: M5
5: SSTART	12: MS4	33: R1	40: R8	47: R15	
6: +JOG	13: MS5	34: R2	41: R9	48: M0	

- NET-OUT output function selection parameters

0: Not used	10: MS2_R	35: R3	45: R13	61: −LS_R	72: TIM
1: FWD_R	11: MS3_R	36: R4	46: R14	62: HOMES_R	73: AREA1
2: RVS_R	12: MS4_R	37: R5	47: R15	63: SLIT_R	74: AREA2
3: HOME_R	13: MS5_R	38: R6	48: M0_R	65: ALM	75: AREA3
4: START_R	16: FREE_R	39: R7	49: M1_R	66: WNG	80: S-BSY
5: SSTART_R	17: C-ON_R	40: R8	50: M2_R	67: READY	82: MPS*
6: +JOG_R	18: STOP_R	41: R9	51: M3_R	68: MOVE	
7: −JOG_R	32: R0	42: R10	52: M4_R	69: END	
8: MS0_R	33: R1	43: R11	53: M5_R	70: HOME-P	
9: MS1_R	34: R2	44: R12	60: +LS_R	71: TLC	

* ARD-AD and ARD-CD only.

8.4 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.14, or "10.6 Initializing driver data" on p.41.

9 Test mode

9.1 Overview of the test mode

- Direct 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 a direct 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**.

- Data select 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.

- Teaching

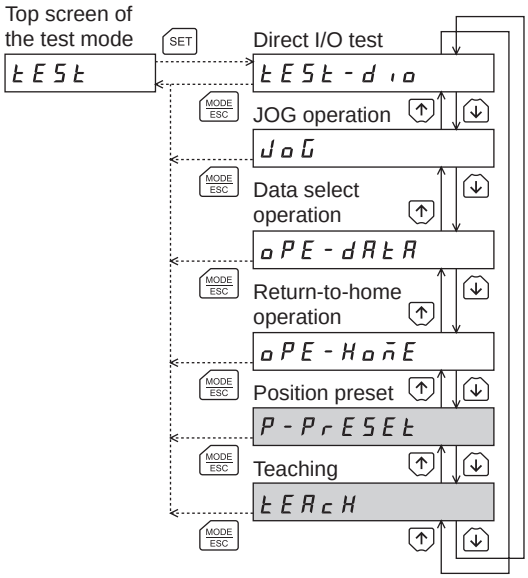
  You can operate the motor using the keys on the **OPX-2A** and reflect the attained position in the operation data.

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, the following inputs will be disabled.
  START, SSTART, HOME, ±JOG, FWD, RVS and MS0 to MS5.
- In the direct I/O test, if the screen moves to the lower level, all of I/O signals and operation will be disabled.
- If the【SET】key is pressed while executing the internal processing via RS-485 communication, "mEm-bUSy" may be displayed. Check “5 Screen transitions” on p.10 when "mEm-bUSy" is displayed. Be sure to wait until all internal processing is completed, before pressing the【SET】key.
- If "Error" is displayed when data select operation, return-to-home operation, position preset or teaching function is performed, check whether an alarm generates.
- When the HMI input is OFF, test mode cannot be executed.

9.2 Operation in the test mode

1. Use the 【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.

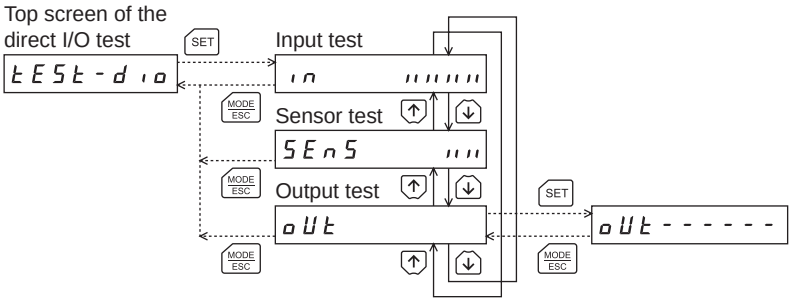
- What happens when the 【SET】 key is pressed while the motor is operating

  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

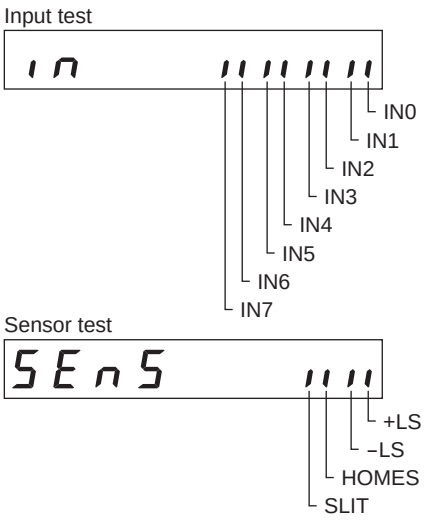
9.3 Direct I/O test

When checking the connection condition of the driver, perform the direct I/O test.

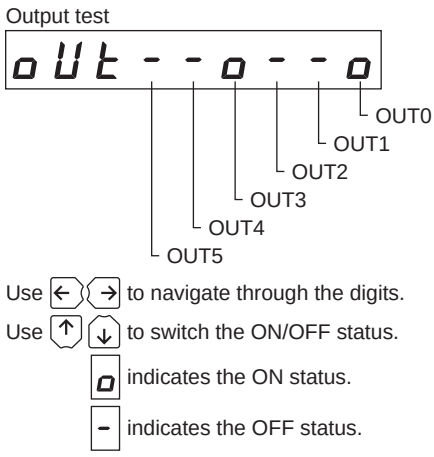


Each digit on the 7-segment LED display corresponds to a signal. The LED is lit when the input signal is ON, and it is unlit when the input signal is OFF.
Use the【↑】【↓】keys to switch the ON-OFF state of the output signal. "▫" is displayed when the signal is ON, while "−" is displayed when the signal is OFF.

- Input signals

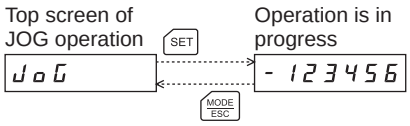


- Output signals



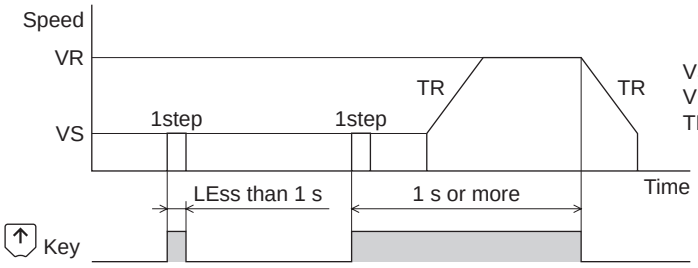
9.4 JOG operation

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



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.

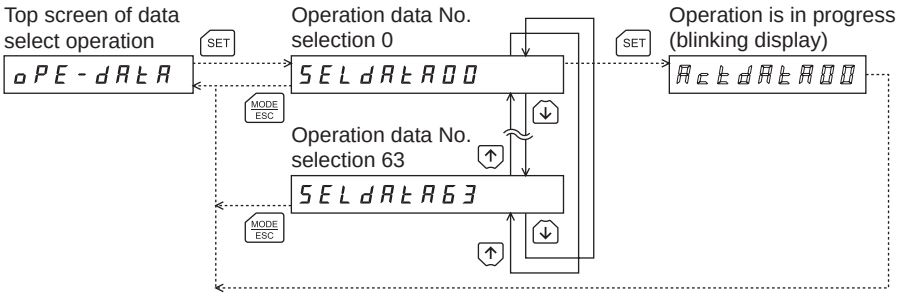
The operating speed corresponds to the value set in the “JOG operating speed” parameter [ID: 323].
Take note that when the value set in the “JOG starting speed” parameter [ID: 325] is greater than the value set in the “JOG operating speed” parameter [ID: 323], the Jog starting speed will become effective.



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 Data select operation

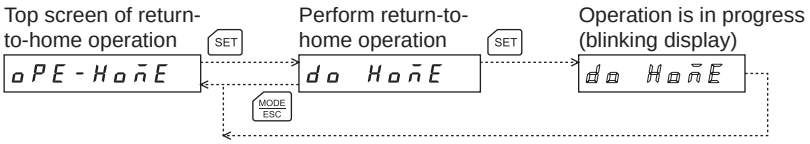
Select a desired operation data number and then press the【SET】key, and positioning operation will be performed.



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

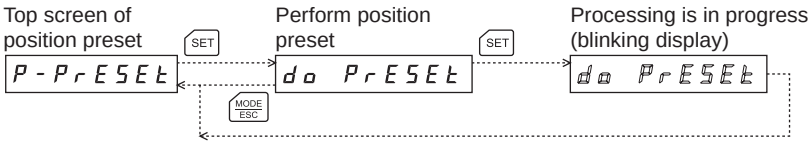
You can perform a return-to-home operation.
The operating speed corresponds to the value set in the “operating speed of home-seeking” parameter [ID: 353].



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

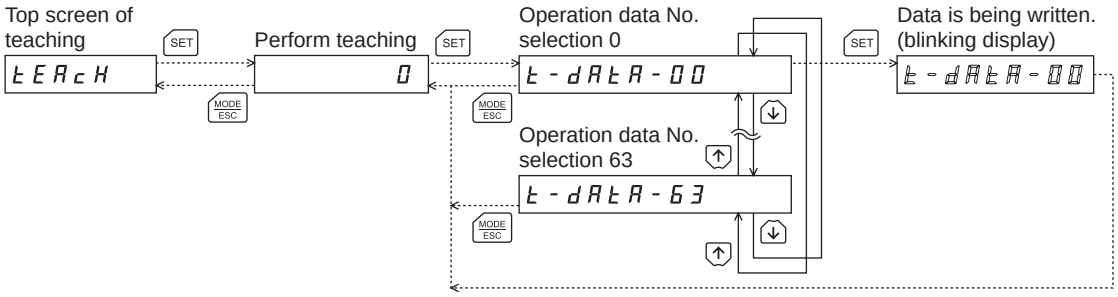
In this operation, the command position is preset by rewriting the value in the “preset position” parameter [ID: 454].



Note If operations are limited by the edit lock function, the preset function cannot be performed.

9.8 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

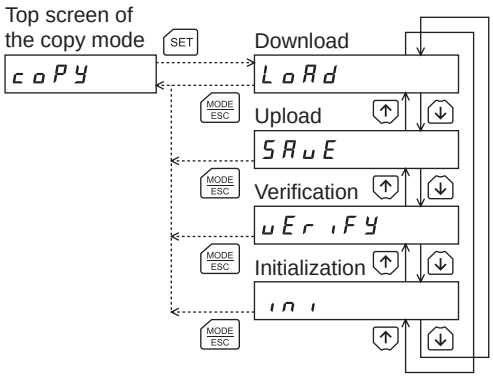
- Download
  Copy data saved in the **OPX-2A** to the driver.
- Upload
  Copy data saved in the driver to the **OPX-2A**.
- Verification
  Verify data in the **OPX-2A** against the corresponding data in the driver.
- Initializing driver data
  Revert data saved in the driver to their initial values.

Note

- Stop the motor operation before changing to the copy mode.
- When moving from the top screen of the copy mode to the lower level, the following inputs will be disabled.
  START, SSTART, HOME, ±JOG, FWD, RVS and MS0 to MS5.
- If the【SET】key is pressed while executing the internal processing via RS-485 communication, "mEm-bUSy" may be displayed. Check “5 Screen transitions” on p.10 when "mEm-bUSy" is displayed. Be sure to wait until all internal processing is completed, before pressing the【SET】key.
- When operations are limited by the edit lock function, copy mode cannot be operated.
- When the HMI input is OFF, uploading and verification can only be executed.

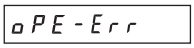
10.2 Operation in the copy mode

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.



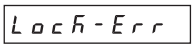
- What happens when the【SET】key is pressed while the motor is operating

Downloading and initialization cannot be executed during operation.
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.



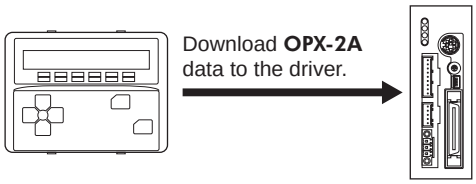
- What happens when the【SET】key is pressed while the edit lock is enabled

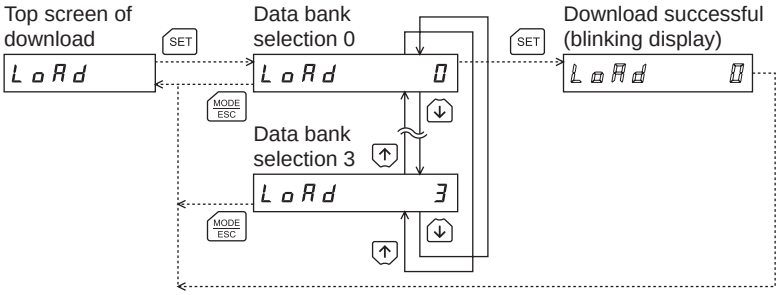
While the edit lock is enabled, you cannot move to any lower level from the top screen of the copy mode. Pressing the【SET】key will generate an error, and "LocK-Err" will be shown.
Be sure to cancel the edit lock before pressing the【SET】key.
Refer to "OPERATING MANUAL Before Use" for the procedure to cancel the edit lock.



10.3 Downloading to the driver

In this operation, data in the specified data bank number are downloaded to the driver.





Note

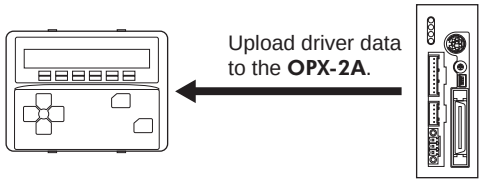
- Some parameters will become effective after cycling the power or executing a configuration. When these parameters were changed by downloading, cycle the driver power or execute a configuration.
- Do not turn off the driver power while the download is still in progress (=while the display is blinking). Doing so may damage the data.

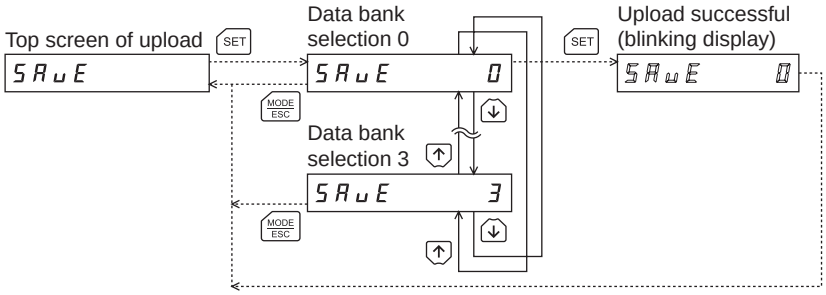
If a download error occurs, a code indicating the nature of the error will blink on the display.
Download will not be performed and the display will return to the top screen of download.

Blinking display	Description	Action
Prod-Err	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**.
HEAd-Err bcc-Err	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.
no-dAtA	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.

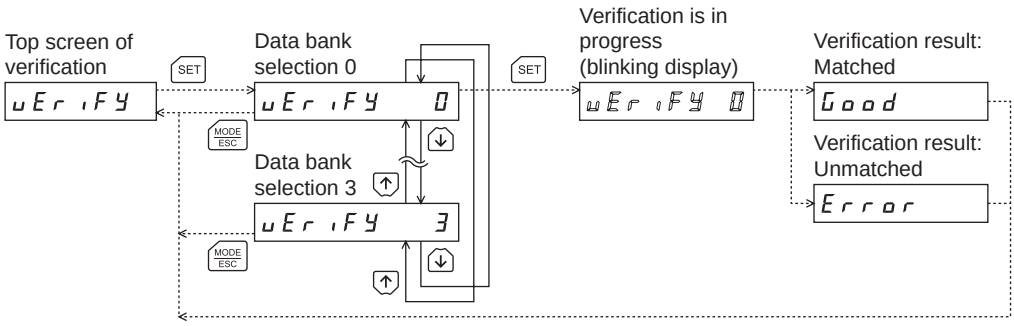




Note Do not turn off the driver power while the upload is still in progress (=while the display is blinking). Doing so may damage the data.

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.

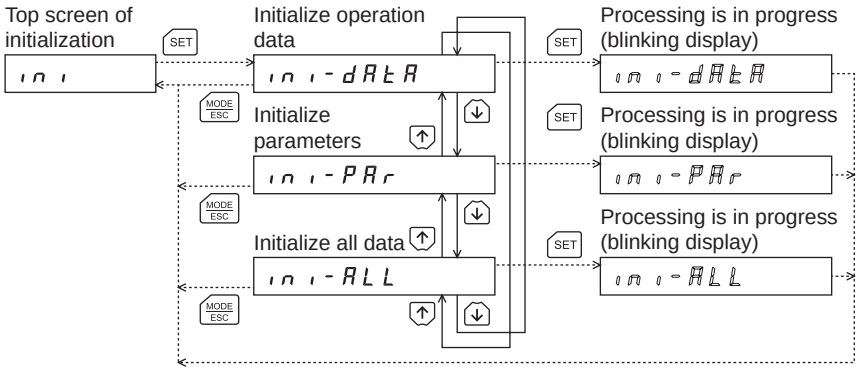


If a verification error occurs, a code indicating the nature of the error will blink on the display. Verification will not be performed and the display will return to the top screen of verification.

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

- Some parameters will become effective after cycling the power or executing a configuration. When these parameters were changed by initializing, cycle the driver power or execute a configuration.
- 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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