

## 4 Direct data operation

Direct data operation is a method that allows overriding of data and start of operation to be executed at the same time.

It is suitable to frequently change operation data such as the position (travel amount) and velocity or to adjust the position finely.

Triggers to start operation at the same time as overriding of data are as follows.

- One of the following items: Operation data number, operation type, position, operating velocity, acceleration rate, deceleration rate, and torque limiting value
- The above seven items are collectively overridden

### ■ Application example of direct data operation

#### ● Example 1

The position (travel amount) or the operating velocity should be adjusted each time a load is changed because the feed rate is different in each load.

##### Setting example

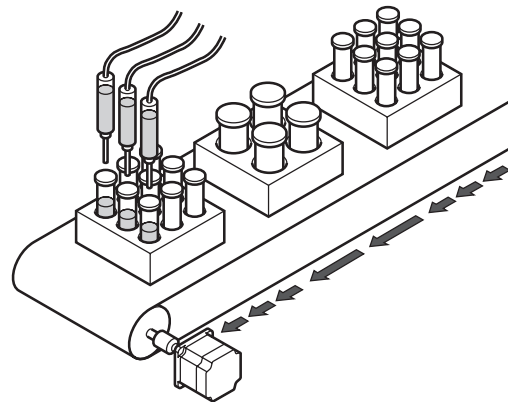
- Position (travel amount): Change as desired
- Operating velocity: Change as desired
- Trigger: All the items (setting value of trigger: 1)

##### Procedure

1. Write the position and the operating velocity.
2. Write "1" to the trigger.

##### Result

When the trigger is written, the changed value is updated immediately, and operation is performed with the new position and the operating velocity.



#### ● Example 2

The operating velocity should be changed immediately with the touch screen because a large load is inspected at a lower rate.

##### Setting example

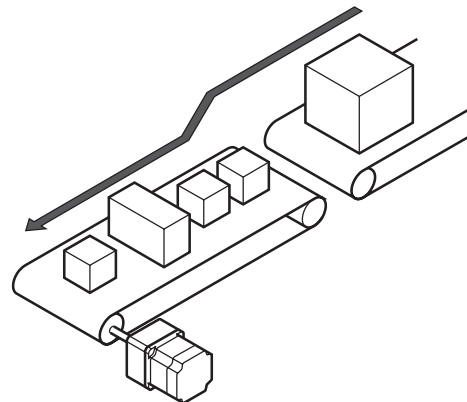
- Operating velocity: Change as desired
- Trigger: Operating velocity (setting value of trigger: -4)

##### Procedure

1. Write "-4" to the trigger.
2. Write the data of the operating velocity.

##### Result

If the operating velocity is written, the changed value is updated immediately, and the operation is performed at the new operating velocity.

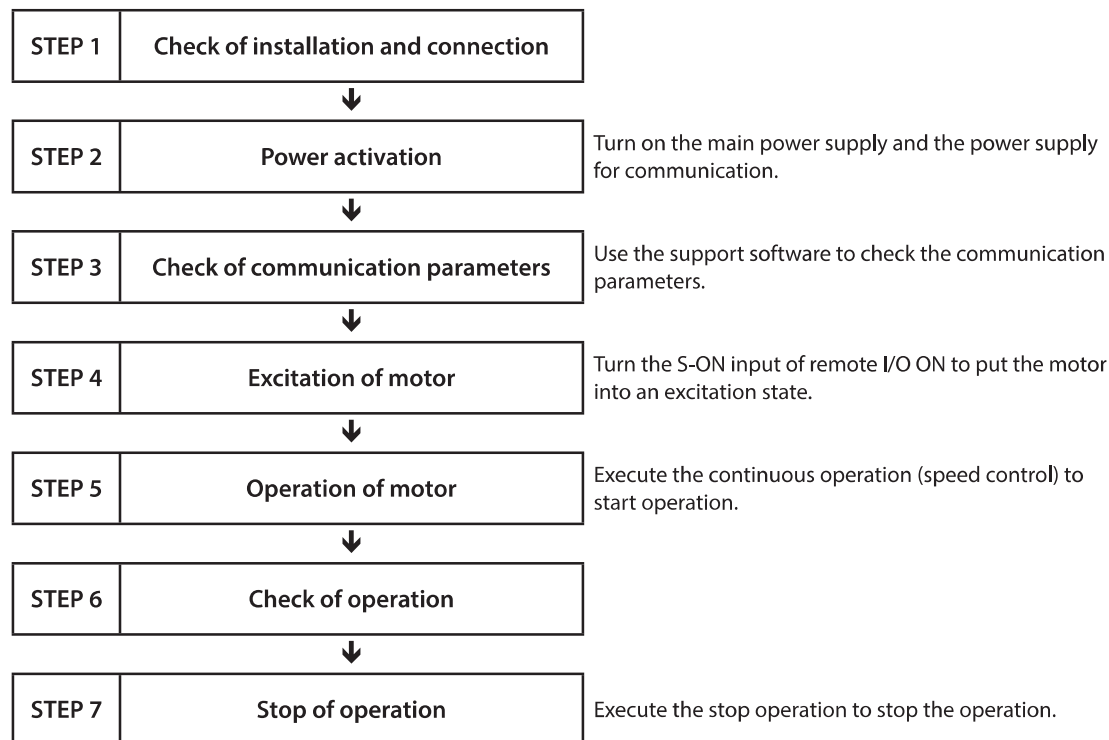


#### Note

To operate the motor, turn the S-ON input ON to put the motor into an excitation state.

## 4-1 Guidance

If you are new to this product, read this section to understand the operating methods along with the operation flow.



### ● Operating conditions

This operation is performed under the following conditions.

- Number of drivers connected: 1 unit
- Address number: 1
- Transmission rate: 230,400 bps
- Termination resistor: Set to enable

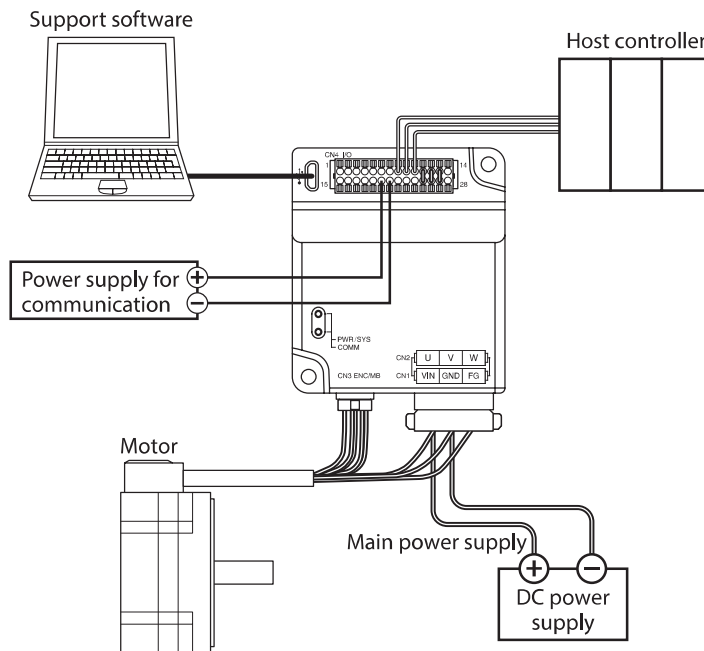


Before operating the motor, check the surrounding conditions to ensure safety.



This guidance is explained using **BLVD-KRD** as an example. For **BLVD-KBRD**, it is not necessary to connect a power supply for communication.

## STEP 1 Check of installation and connection



## STEP 2 Power activation

Turn on the main power supply and the power supply for communication.  
 Start the support software.  
 Execute "Communication port" to check the setting of the communication port.  
 Execute "Data reading" to read the driver data.

## STEP 3 Check of communication parameters

Start "Starts the simple setting." of the support software.

(m1) Communication setting

☒ Start the simple setting.

Communication function

COM Setting Condition: COMM-I/F mode selection: CANopen&Modbus RTU CANopen / Modbus RTU

Power supply for communication: OFF \* To communicate, the communication power supply is required to be turned on.  
Communication power supply lost action: Disable

ID-SEL(Applicable value): 0 ☐ ID-SEL0 ☐ ID-SEL1 ☐ ID-SEL2 ☐ ID-SEL3  
ID-SEL(Present value): 0 ☐ ID-SEL0 ☐ ID-SEL1 ☐ ID-SEL2 ☐ ID-SEL3

CANopen Communication setting

Node-ID: Follow ID-SEL input (Input value) 1 (Present value) Reflecting on the driver.  
Baudrate: 500 kbps (Input value) 500 kbps (Present value)

☒ Statusword - remote CANopen com. status

Communication status: Initialization  
Communication error: No error  
Reception count: 0  
Transmission count: 0

Modbus Communication setting

Slave address: Follow ID-SEL input (Input value) 1 (Present value) Reflecting on the driver.  
Baudrate: 230400 bps (Input value) 230400 bps (Present value)  
Communication parity: Even (Input value) Even (Present value) RS-485 com. status  
Termination resistor: Enable When Slave address=4 (Input value) Disable (Present value)

Communication stop bit: 1 bit  
Transmission waiting time [ms]: 3.0  
Communication error detection: 3  
Communication timeout [ms]: 0  
Silent interval [ms]: 0.0

Communication error condition: 00:Communication error not present  
Reception byte: 0  
Transmission byte: 0  
Normal reception frame (Only own): 0  
Transmission frame: 0  
Communication interval [ms]: 0

Set the following communication parameters according to the communication parameters of the host controller.

Modbus Communication setting

Slave address: Follow ID-SEL input (Input value) 1 (Present value) Reflecting on the driver.  
Baudrate: 230400 bps (Input value) 230400 bps (Present value)  
Communication parity: Even (Input value) Even (Present value) RS-485 com. status  
Termination resistor: Enable When Slave address=4 (Input value) Disable (Present value)

If the values are different, change the value of the "Input value" and execute "Reflecting on the driver."

If the following communication parameters are different from those of the host controller, execute "Detailed setting..." to change the parameters.

| Parameter name                  | Setting                             |
|---------------------------------|-------------------------------------|
| Byte & word order (Modbus)      | Even Address-High Word & Big-Endian |
| Communication stop bit (Modbus) | 1 bit                               |

## STEP 4      Excitation of motor

Send the following query to turn the S-ON input of remote I/O ON.  
Turning the S-ON input ON causes the motor to put into an excitation state.

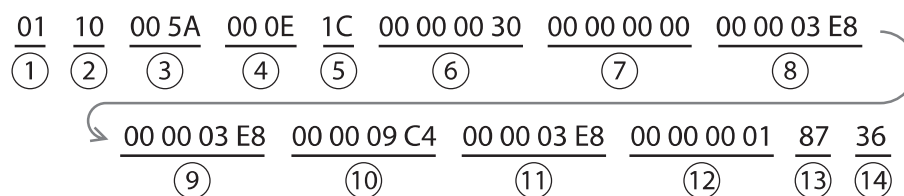
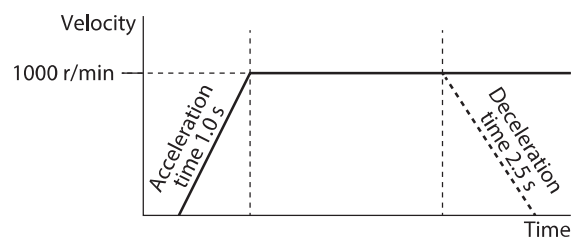
01   10   00 7C   00 02   04   00 00 00 01   35   1E  
 ①   ②   ③   ④   ⑤   ⑥   ⑦   ⑧

| Number | Communication data (HEX) | Description   |
|--------|--------------------------|---|
| ①      | 01                       | Address number=1  |
| ②      | 10                       | Function code=10h   |
| ③      | 00 7C                    | Write register lead address=007Ch                               |
| ④      | 00 02                    | Number of write registers=2 registers                           |
| ⑤      | 04                       | Number of write data bytes=4 bytes                              |
| ⑥      | 00 00 00 01              | Turn the S-ON input ON (put the motor into an excitation state) |
| ⑦      | 35                       | Error check (lower)   |
| ⑧      | 1E                       | Error check (upper)   |

## STEP 5 Operation of motor

As an example, this section explains how to execute the following operation. The trigger is assumed to be overridden collectively.

### [Operation profile]



1. Send the operation data and the trigger with the following query. Operation is started at the same time as the send.

| Number | Communication data (HEX) | Description  |
|--------|--------------------------|--|
| ①      | 01                       | Address number=1   |
| ②      | 10                       | Function code=10h  |
| ③      | 00 5A                    | Write register lead address=005Ah  |
| ④      | 00 0E                    | Number of write registers=14 registers                                     |
| ⑤      | 1C                       | Number of write data bytes=28 bytes  |
| ⑥      | 00 00 00 30              | Operation type=48: (Motion extension) continuous operation (speed control) |
| ⑦      | 00 00 00 00              | Position=0 step  |
| ⑧      | 00 00 03 E8              | Operating velocity=1000 r/min  |
| ⑨      | 00 00 03 E8              | Acceleration rate=1,000 ms   |
| ⑩      | 00 00 09 C4              | Deceleration rate=2,500 ms   |
| ⑪      | 00 00 03 E8              | Torque limiting value=100.0%   |
| ⑫      | 00 00 00 01              | Trigger=1: Normal start, Lifetime disable                                  |
| ⑬      | 87                       | Error check (lower)  |
| ⑭      | 36                       | Error check (upper)  |

Setting of operation profile

2. Check the motor rotates without any problem.



**Note** When combining a 400 W motor with a gear, use the motion extension mode. When the 400 W motor with a gear is used in a normal state, the motor may be damaged if it rapidly decelerates while the demand velocity is significantly different from the actual velocity.

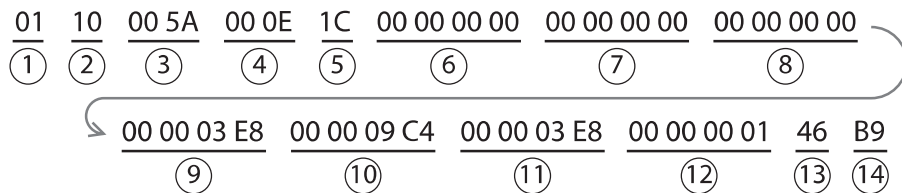
**STEP 6 Check of operation**

How did it go? Were you able to operate the motor properly? If the motor does not operate, check the following points.

- Is any alarm present?
- Are the power supply, the motor, and the RS-485 communication cable connected securely?
- Is the power supply for communication turned on?
- Are the slave addresses, the transmission rate, and the termination resistor set correctly?
- Is the COMM LED unlit? Or is it lit in red? (A communication error occurs)
- Is an unintended input signal is turned ON?

**STEP 7 Stop of operation**

1. Send the operation data and the trigger with the following query. Operation is stopped at the same time as the send.



| Number | Communication data (HEX) | Description  |
|--------|--------------------------|--|
| ①      | 01                       | Address number=1   |
| ②      | 10                       | Function code=10h  |
| ③      | 00 5A                    | Write register lead address=005Ah  |
| ④      | 00 0E                    | Number of write registers=14 registers   |
| ⑤      | 1C                       | Number of write data bytes=28 bytes  |
| ⑥      | 00 00 00 00              | Operation type=0: Deceleration rate stop<br>(according to the specified operation profile) |
| ⑦      | 00 00 00 00              | Position=0 step  |
| ⑧      | 00 00 00 00              | Operating velocity=0 r/min   |
| ⑨      | 00 00 03 E8              | Acceleration rate=1,000 ms   |
| ⑩      | 00 00 09 C4              | Deceleration rate=2,500 ms   |
| ⑪      | 00 00 03 E8              | Torque limiting value=100.0%   |
| ⑫      | 00 00 00 01              | Trigger=1: Normal start, Lifetime disable  |
| ⑬      | 46                       | Error check (lower)  |
| ⑭      | B9                       | Error check (upper)  |

2. Check the motor stops without any problem.

## 4-2 Command necessary for direct data operation

| Register address |                | Name  | Description   | Initial setting |        |
|------------------|----------------|---|---|-----------------|--------|
| Upper            | Lower          |   |   | Initial value   | Unit   |
| 88<br>(0058h)    | 89<br>(0059h)  | Direct data operation operation data number | <p>The operation data of the specified operation data number is transferred to the direct data operation command.</p> <p>Writing a value of the operation data number executes the data transfer.</p> <p>Commands to be transferred are as follows.</p> <ul style="list-style-type: none"> <li>• Direct data operation operation type</li> <li>• Direct data operation position</li> <li>• Direct data operation operating velocity</li> <li>• Direct data operation acceleration rate</li> <li>• Direct data operation deceleration rate</li> <li>• Direct data operation torque limiting value</li> </ul> <p><b>[Setting range]</b><br/>0 to 255: Operation data No.0 to No.255</p> | 0 *1            | —      |
| 90<br>(005Ah)    | 91<br>(005Bh)  | Direct data operation operation type        | <p>Sets the operation type for direct data operation.</p> <p><b>[Setting range]</b><br/>Refer to "3-4 Selecting the operation type" on p.65.</p>  | 0 *2            | —      |
| 92<br>(005Ch)    | 93<br>(005Dh)  | Direct data operation position              | <p>Sets the target position for direct data operation.</p> <p><b>[Setting range]</b><br/>–2,147,483,648 to 2,147,483,647<br/>(User-defined position unit)</p>   | 0 *2            | step   |
| 94<br>(005Eh)    | 95<br>(005Fh)  | Direct data operation operating velocity    | <p>Sets the operating velocity for direct data operation.</p> <p><b>[Setting range]</b><br/>–4,000,000 to 4,000,000 (User-defined velocity unit)</p>  | 0 *2            | r/min  |
| 96<br>(0060h)    | 97<br>(0061h)  | Direct data operation acceleration rate     | <p>Sets the acceleration rate (acceleration time) for direct data operation.</p> <p><b>[Setting range]</b><br/>1 to 1,000,000,000<br/>(User-defined acceleration/deceleration unit)</p>   | 1,000 *2        | ms     |
| 98<br>(0062h)    | 99<br>(0063h)  | Direct data operation deceleration rate     | <p>Sets the deceleration rate (deceleration time) for direct data operation.</p> <p><b>[Setting range]</b><br/>1 to 1,000,000,000<br/>(User-defined acceleration/deceleration unit)</p>   | 1,000 *2        | ms     |
| 100<br>(0064h)   | 101<br>(0065h) | Direct data operation torque limiting value | <p>Sets the torque limiting value for direct data operation.</p> <p><b>[Setting range]</b><br/>0 to 10,000 (1=0.1%) *3</p>  | 10,000 *2       | 1=0.1% |



| Register address |                | Name   | Description  | Initial setting |      |
|------------------|----------------|--|--|-----------------|------|
| Upper            | Lower          |  |  | Initial value   | Unit |
| 102<br>(0066h)   | 103<br>(0067h) | Direct data operation trigger                | <p>Sets the trigger and the lifetime for direct data operation.</p> <p><b>[Setting range]</b><br/>           &lt;Upper 16 bits&gt; Lifetime setting *4<br/>           –1, 0: Direct data operation lifetime disable<br/>           1 to 32767: Direct data operation lifetime setting value [ms]<br/>           &lt;Lower 16 bits&gt; Trigger setting<br/>           –7: Operation data number<br/>           –6: Operation type<br/>           –5: Position<br/>           –4: Operating velocity<br/>           –3: Acceleration rate<br/>           –2: Deceleration rate<br/>           –1: Torque limiting value<br/>           0: Disable<br/>           1 to 3: Normal start<br/>           4, 5: Unit specified start (acceleration/deceleration: rate)<br/>           6, 7: Unit specified start (acceleration/deceleration: time)<br/>           8, 9: Unit specified start (velocity: step/s)<br/>           10, 11: Unit specified start (velocity: step/s, acceleration/deceleration: rate)<br/>           12, 13: Unit specified start (velocity: step/s, acceleration/deceleration: time)<br/>           14, 15: Unit specified start (velocity: r/min)<br/>           16, 17: Unit specified start (velocity: r/min, acceleration/deceleration: rate)<br/>           18, 19: Unit specified start (velocity: r/min, acceleration/deceleration: time)</p> | 0               | –    |
| 104<br>(0068h)   | 105<br>(0069h) | Direct data operation forwarding destination | <p>Selects the stored area when the next direct data is transferred during direct data operation.<br/>           (Data destination ⇒ p.83)</p> <p><b>[Setting range]</b><br/>           0: Execution memory<br/>           1: Buffer memory</p>  | 0               | –    |

\*1 The value set in the "Direct data operation operation parameter initial value reference data number" parameter will be the initial value.

\*2 The operation data of the operation data number set in the "Direct data operation operation parameter initial value reference data number" parameter will be the initial value.

\*3 The maximum torque limiting value varies depending on the motor. Refer to p.41 for the maximum value of each motor.

\*4 It is effective for the driver version 3.00 or later.

## ■ Related parameters

| Register address |                | Name  | Description   | Initial setting |      |
|------------------|----------------|---|---|-----------------|------|
| Upper            | Lower          |   |   | Initial value   | Unit |
| 544<br>(0220h)   | 545<br>(0221h) | Direct data operation zero speed command action                               | When "0" is written to the operating velocity, selects whether to decelerate the motor to a stop or to change only the velocity to "0" in an operating status. *1<br>[Setting range]<br>0: Deceleration stop command<br>1: Velocity zero command  | 0               | —    |
| 546<br>(0222h)   | 547<br>(0223h) | Direct data operation trigger initial value                                   | Sets the initial value of the trigger (lower 16 bits).<br>[Setting range]<br>–7: Operation data number update<br>–6: Operation type update<br>–5: Position update<br>–4: Operating velocity update<br>–3: Acceleration rate update<br>–2: Deceleration rate update<br>–1: Torque limiting value update<br>0: The trigger is used  | 0               | —    |
| 548<br>(0224h)   | 549<br>(0225h) | Direct data operation data destination initial value                          | Sets the initial value of the data destination.<br>[Setting range]<br>0: Execution memory<br>1: Buffer memory   | 0               | —    |
| 550<br>(0226h)   | 551<br>(0227h) | Direct data operation operation parameter initial value reference data number | Sets the operation data number to be used as the initial value for direct data operation.<br>[Setting range]<br>0 to 255: Operation data number   | 0               | —    |
| 552<br>(0228h)   | 553<br>(0229h) | Direct data operation trigger automatic clear                                 | Sets the movement when setting "Direct data operation trigger" which is set the trigger factor to transfer or update the data in the direct data operation memory area as execution data. When this parameter is set to enable, if direct data operation is started by writing to "Direct data operation trigger," the trigger (lower 16 bits) of "Direct data operation trigger" is automatically cleared to "0" regardless of whether it is successful or not. Therefore, if the same data is written, direct data operation can be started as many times as written. When this parameter is set to disable, "Direct data operation trigger" is not cleared to 0 even if it is written. Therefore, direct data operation is not started even if the same data is written in succession. To restart, one of the following is required.<br>• Write "0" to "Direct data operation trigger" and then write the value for starting.<br>• Write a different value to "Direct data operation trigger."<br>[Setting range]<br>0: Disable<br>1: Enable | 1               | —    |
| 572<br>(023Ch)   | 573<br>(023Dh) | Direct data operation lifetime initial value *2                               | Sets the initial value for direct data operation lifetime.<br>[Setting range]<br>0: Disable<br>1 to 32,767 ms   | 0               | ms   |

\*1 Although the motor does not rotate because the velocity is "0," the output signals are in an operating status.

\*2 It is effective for the driver version 3.00 or later.

## 4-3 Trigger and lifetime

Sets the trigger and the lifetime for direct data operation.

Upper 16 bits: Direct data operation lifetime

Lower 16 bits: Trigger

**Note** If either the direct data operation lifetime or the trigger is out of the range, a communication error of "Out of setting range" occurs. In this case, both the upper and lower values are not applied.

### ■ Lower 16 bits Trigger

This is a trigger to start operation at the same time as overriding of data in direct data operation.

### ■ When the trigger setting is "0" to "19"

When the following value is written, all data is written in the selected unit, and simultaneously direct data operation is started. It is not started if the same value is written. If the "Direct data operation trigger automatic clear" parameter is set to "Enable," the trigger (lower 16 bits) will automatically return to "0" regardless of whether the operation is started or not (initial value: Enable).

xxxx: If the lifetime is not used, set 0000h or FFFFh.

Set the lifetime when using it.

| Setting value |  | Starting mode   | Starting method                            |   |
|---------------|--|---|--|---|
| Dec *         | Hex  |   | Velocity unit                              | Acceleration/<br>deceleration unit                        |
| 0             | xxxx 0000h                                 | Not start   | —  | —   |
| 1 (or 2, 3)   | xxxx 0001h<br>(xxxx 0002h)<br>(xxxx 0003h) | Normal start  | User-defined velocity unit                 | User-defined<br>acceleration/<br>deceleration unit        |
| 4 (or 5)      | xxxx 0004h<br>(xxxx 0005h)                 | Unit specified start<br>(acceleration/<br>deceleration)           | User-defined velocity unit                 | (Velocity unit)/s<br>(acceleration/<br>deceleration rate) |
| 6 (or 7)      | xxxx 0006h<br>(xxxx 0007h)                 | Unit specified start<br>(acceleration/<br>deceleration)           | User-defined velocity unit                 | ms<br>(acceleration/<br>deceleration time)                |
| 8 (or 9)      | xxxx 0008h<br>(xxxx 0009h)                 | Unit specified start<br>(velocity)                                | step/s<br>((User-defined position unit)/s) | User-defined<br>acceleration/<br>deceleration unit        |
| 10 (or 11)    | xxxx 000Ah<br>(xxxx 000Bh)                 | Unit specified start<br>(velocity, acceleration/<br>deceleration) | step/s<br>((User-defined position unit)/s) | (Velocity unit)/s<br>(acceleration/<br>deceleration rate) |
| 12 (or 13)    | xxxx 000Ch<br>(xxxx 000Dh)                 | Unit specified start<br>(velocity, acceleration/<br>deceleration) | step/s<br>((User-defined position unit)/s) | ms<br>(acceleration/<br>deceleration time)                |
| 14 (or 15)    | xxxx 000Eh<br>(xxxx 000Fh)                 | Unit specified start<br>(velocity)                                | r/min (motor shaft)                        | User-defined<br>acceleration/<br>deceleration unit        |
| 16 (or 17)    | xxxx 0010h<br>(xxxx 0011h)                 | Unit specified start<br>(velocity, acceleration/<br>deceleration) | r/min (motor shaft)                        | (Velocity unit)/s<br>(acceleration/<br>deceleration rate) |
| 18 (or 19)    | xxxx 0012h<br>(xxxx 0013h)                 | Unit specified start<br>(velocity, acceleration/<br>deceleration) | r/min (motor shaft)                        | ms<br>(acceleration/<br>deceleration time)                |

\* This is the value when the lifetime is not used.

**Note** If the operation is started in a state where the setting value is "8" to "19" (Unit specified start (velocity) or Unit specified start (velocity, acceleration/deceleration)), the monitor unit of the target velocity will be the same as the specified unit only when the operation is being performed. Therefore, the target velocity is the value having commanded.

## ■ When the trigger setting is "-1" to "-7"

Direct data operation is started when the data corresponding to the trigger is written. Even if operation is started, the setting value of the trigger is retained.

xxxx: If the lifetime is not used, set 0000h or FFFFh.

Set the lifetime when using it.

| Setting value |            | Starting mode                            | Starting method            |   |
|---------------|------------|--|----------------------------|---|
| Dec *         | Hex        |  | Velocity unit              | Acceleration/deceleration unit              |
| -7            | xxxx FFF9h | Start when writing operation data number | User-defined velocity unit | User-defined acceleration/deceleration unit |
| -6            | xxxx FFFAh | Start when writing operation type        | User-defined velocity unit | User-defined acceleration/deceleration unit |
| -5            | xxxx FFFBh | Start when writing position              | User-defined velocity unit | User-defined acceleration/deceleration unit |
| -4            | xxxx FFFCh | Start when writing velocity              | User-defined velocity unit | User-defined acceleration/deceleration unit |
| -3            | xxxx FFFDh | Start when writing acceleration rate     | User-defined velocity unit | User-defined acceleration/deceleration unit |
| -2            | xxxx FFFEh | Start when writing deceleration rate     | User-defined velocity unit | User-defined acceleration/deceleration unit |
| -1            | xxxx FFFFh | Start when writing torque limiting value | User-defined velocity unit | User-defined acceleration/deceleration unit |

\* This is the value when the lifetime is not used.

## ■ Setting value of xxxx (setting value of lifetime)

| Setting value |       | Direct data operation lifetime action | Description   |
|---------------|-------|---------------------------------------|---|
| Dec           | Hex   |                                       |   |
| -32768        | 8000h | Out of setting range                  | The direct data operation lifetime is out of the setting range. The lifetime is continued counting while being counted. |
| •             | •     |                                       |   |
| •             | •     |                                       |   |
| -2            | FFFEh | Stop                                  | The direct data operation lifetime is disabled. The lifetime is stopped counting when already counting.                 |
| -1            | FFFFh |                                       |   |
| 0             | 0000h |                                       |   |
| 1             | 0001h | Start                                 | The setting value will be the direct data operation lifetime [ms]. The lifetime is updated when already counting.       |
| 2             | 0002h |                                       |   |
| •             | •     |                                       |   |
| •             | •     |                                       |   |
| 32767         | 7FFFh |                                       |   |

## ■ Upper 16 bits Direct data operation lifetime

### ● Direct data operation lifetime

The lifetime for direct data operation can be set.

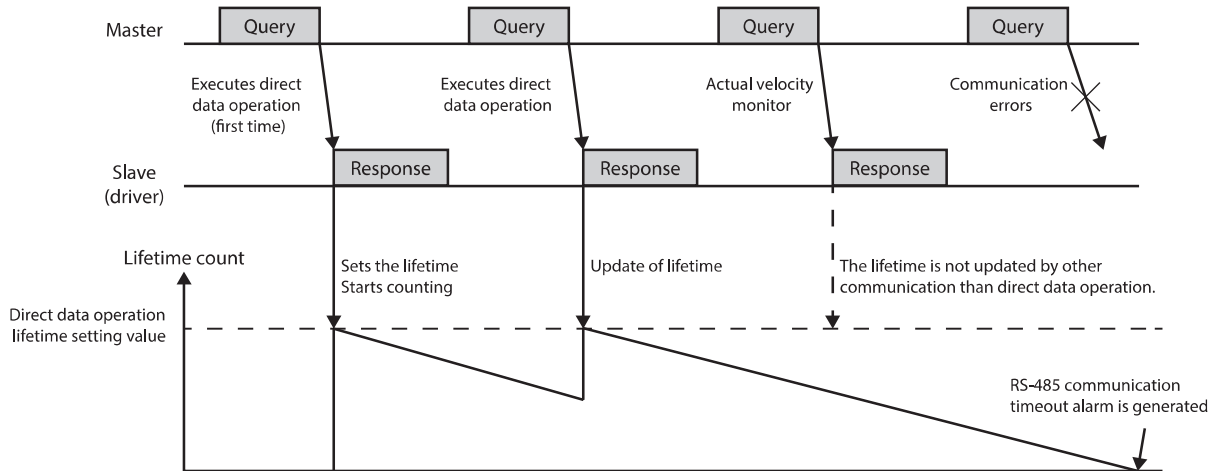
Use the lifetime when direct data operation is periodically executed.

If the lifetime is set, the timer inside the driver starts counting (countdown) when direct data operation is executed.

When the count value reaches "0," an alarm of "RS-485 communication timeout" is generated, and the motor stops.

The lifetime is updated when the direct data operation is executed.

It is not updated by other communication than direct data operation.



### ● Update of lifetime

The lifetime is stopped counting to set again.

The lifetime is updated at the following.

- When direct data operation is executed
- When the "Direct data operation trigger" command is written

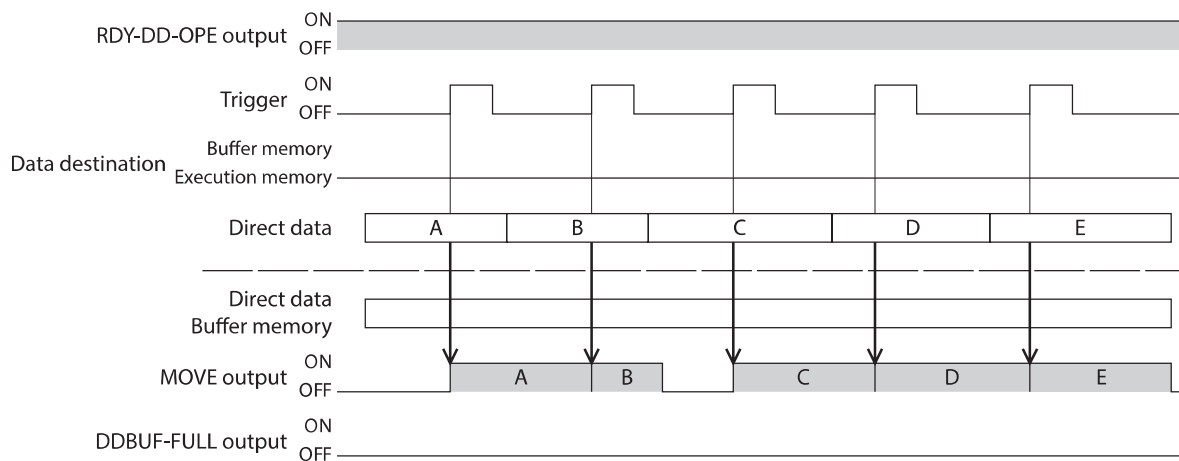
## 4-4 Data destination

During direct data operation, the stored area when the next direct data is transferred can be selected.

| Setting value |            | Data destination |
|---------------|------------|------------------|
| Dec           | Hex        |                  |
| 0             | 0000 0000h | Execution memory |
| 1             | 0000 0001h | Buffer memory    |

### ■ When the data destination is set to "Execution memory"

When the trigger is written, the data in operation can be overridden to the next direct data.

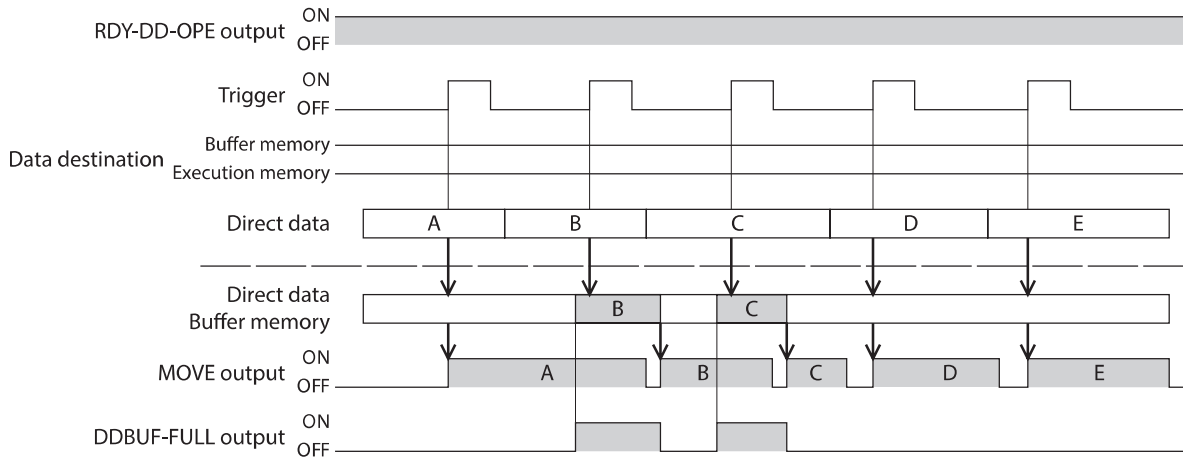


## ■ When the data destination is set to "Buffer memory"

If the trigger is written, the next direct data is stored in the buffer memory. When the data during operation is completed, operation of the buffer memory is automatically started. One direct data can be stored in the buffer memory. If the next direct data is written to the buffer memory, the DDBUF-FULL output is turned ON. During stop or continuous operation, if "Buffer memory" is specified, the data is not stored in the buffer memory and it is overridden to the next direct data immediately.

In the following cases, even if "Buffer memory" is specified, the direct data is not stored in the buffer memory. It is rewritten to the next direct data immediately.

- When stopped (when operation is already ended)
- During continuous operation
- While instructing execution of stop operation



### Note

If the trigger is written in a state where the DDBUF-FULL output is ON, the following is applied.  
 When the data destination is set to "Buffer memory": The direct data is not applied.  
 When the data destination is set to "Execution memory": The written data is applied.  
 The data in the buffer memory is cleared.

## 4-5 Transfer of operation data

The value is transferred from the operation data of the direct data operation operation data number to each command at the following time.

- When the main power supply is turned on or when Configuration is executed.
- When writing to the direct data operation operation data number is executed

Operation data (data source) and direct data operation command (data destination) are as follows.

| Operation data (data source)            | Direct data operation command (data destination) |
|---|--|
| Operation type                          | Direct data operation operation type             |
| Position                                | Direct data operation position                   |
| Velocity                                | Direct data operation operating velocity         |
| Acceleration rate / Acceleration time * | Direct data operation acceleration rate          |
| Deceleration rate / Deceleration time * | Direct data operation deceleration rate          |
| Torque limiting value                   | Direct data operation torque limiting value      |

\* The operation data of the data source varies depending on the setting of the "User-defined acceleration/ deceleration unit setting (DD, FWRV, SD, HOME operation)" parameter.  
 (User-defined velocity unit)/s: Acceleration rate and deceleration rate  
 ms: Acceleration time and deceleration time

## 4-6 Operation example when operation data was overridden

This is operation when the data destination was set to "Execution memory" and the operation data was overridden (override).

(Operation example)

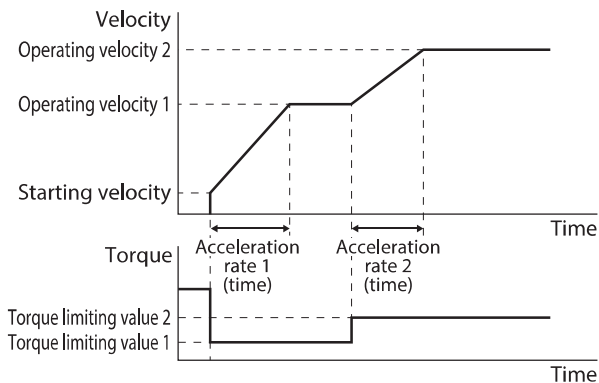
Operation when having overridden to the direct data operation 2 while the direct data operation 1 is executed

### Example 1

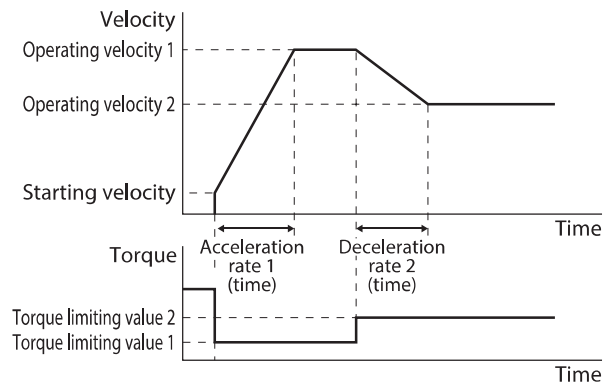
Direct data operation 1: Continuous operation

Direct data operation 2: Continuous operation

When operating velocity 2 is faster than operating velocity 1



When operating velocity 1 is faster than operating velocity 2

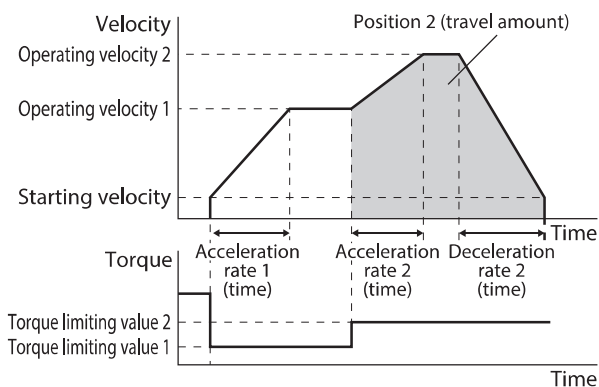


### Example 2

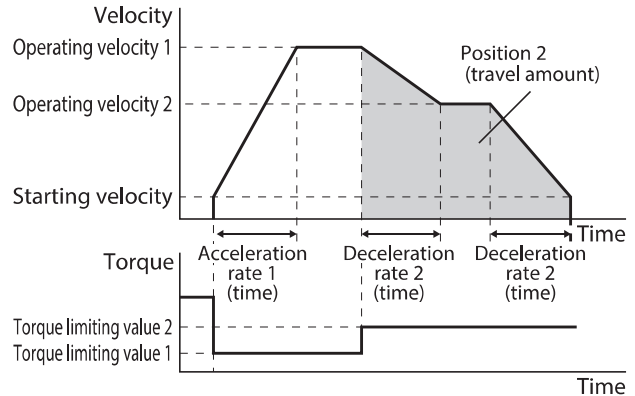
Direct data operation 1: Positioning operation

Direct data operation 2: Positioning operation

When operating velocity 2 is faster than operating velocity 1



When operating velocity 1 is faster than operating velocity 2

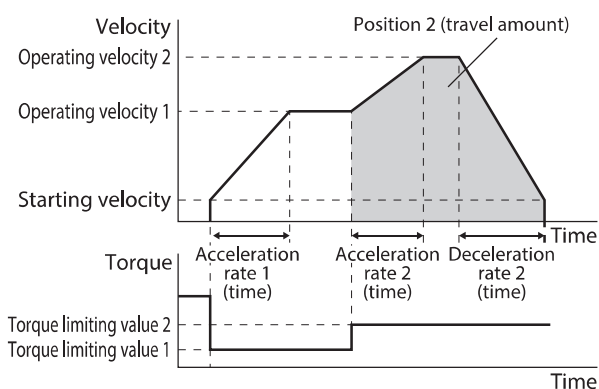


### Example 3

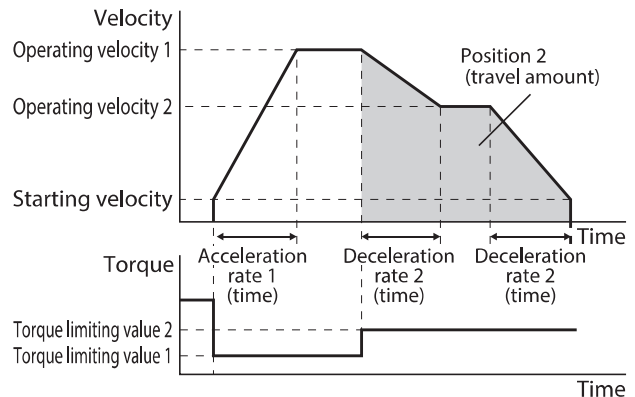
Direct data operation 1: Continuous operation

Direct data operation 2: Positioning operation

When operating velocity 2 is faster than operating velocity 1



When operating velocity 1 is faster than operating velocity 2





**Note**

When the user-defined acceleration/deceleration unit is "ms" (time), the slope of acceleration/deceleration is calculated based on the time from when the writing was performed. Therefore, when the same data is redundantly written, the slope of acceleration/deceleration will be smaller than that when it was written the first time even if the same data is written. (\*1, \*2)

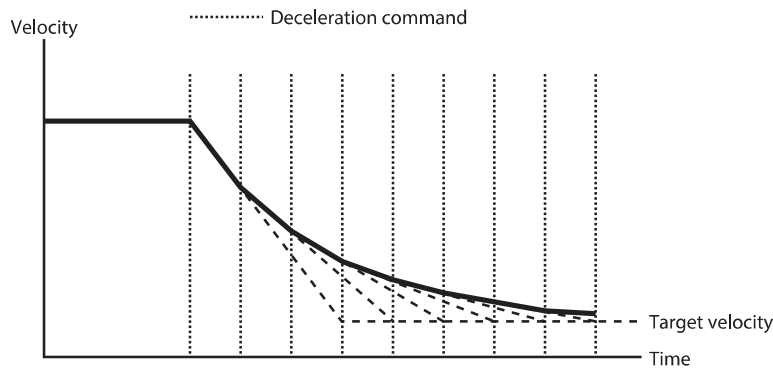
\*1 When the demand velocity does not reach the target velocity.

\*2 Stp operation is excluded.

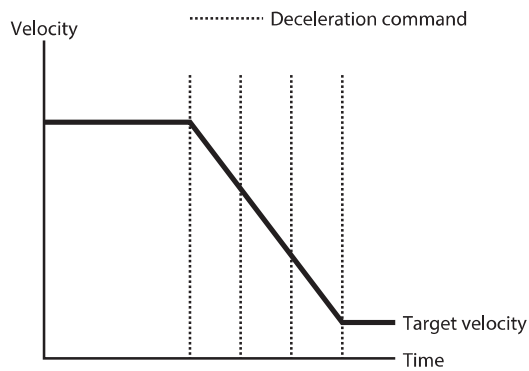
When the same data is redundantly written, setting the acceleration/deceleration unit to "(User-defined velocity unit)/s" (acceleration/deceleration rate) is recommended.

**Example: If the same data is written multiple times when decelerating from high speed to low speed.**

- User-defined acceleration/deceleration unit: ms

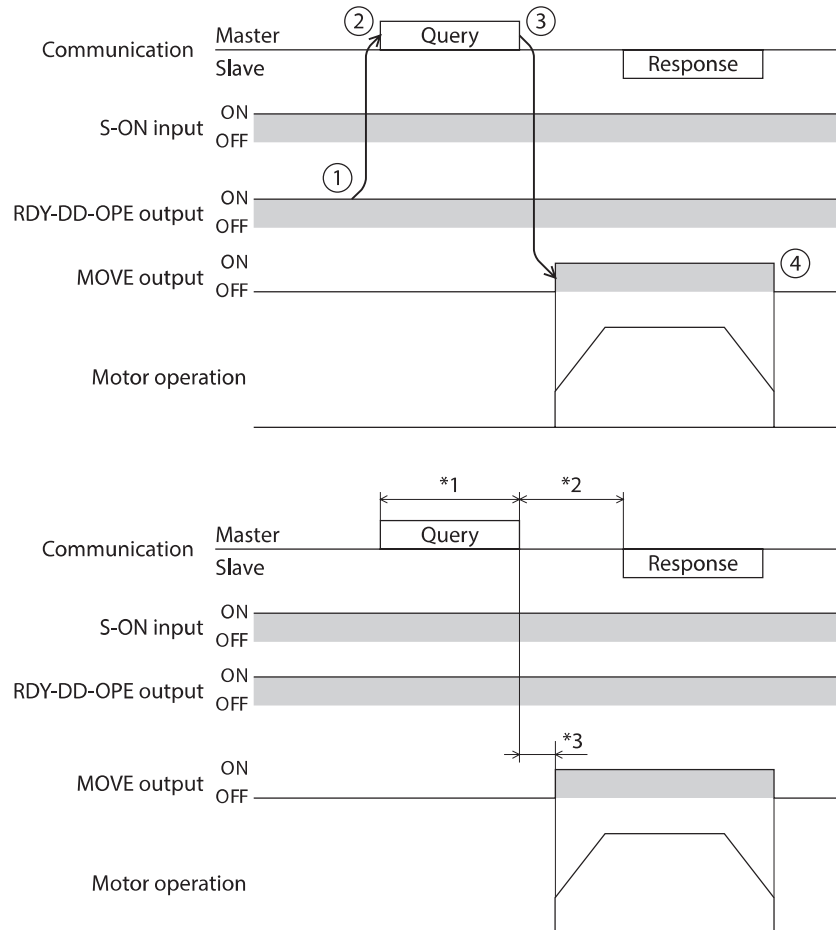


- User-defined acceleration/deceleration unit: (User-defined velocity unit)/s



## 4-7 Timing chart

1. Check the RDY-DD-OPE output is being ON.
2. Send a query (including the trigger and data) to execute direct data operation.
3. When the master sends a query, the MOVE output is turned ON and operation is started.
4. When the motor stops, the MOVE output is turned OFF.



\*1 Query via RS-485 communication

\*2 C3.5 (silent interval) + Longer one from among Tb4 (query processing time) and Tb2 (transmission waiting time)

\*3 C3.5 (silent interval) + Tb4 (query processing time) + 2 ms or less