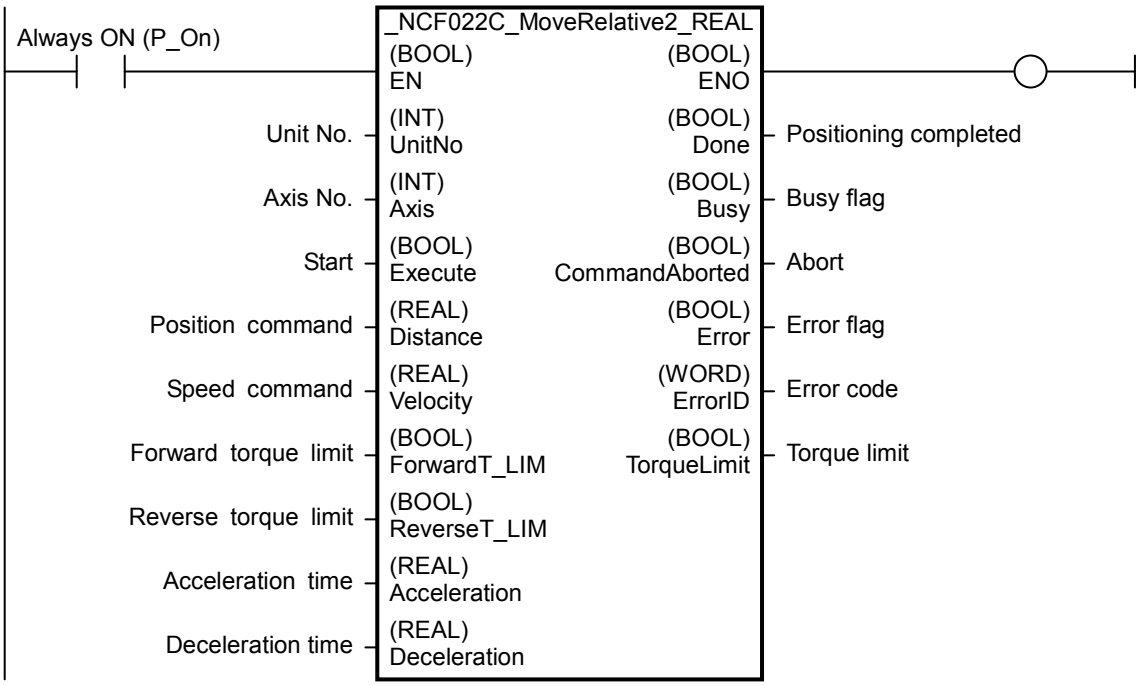
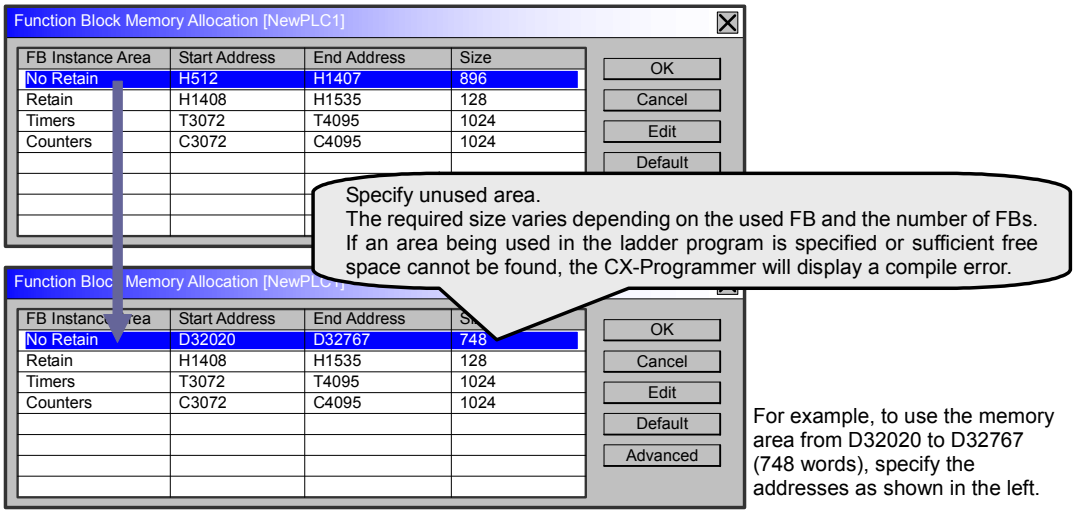
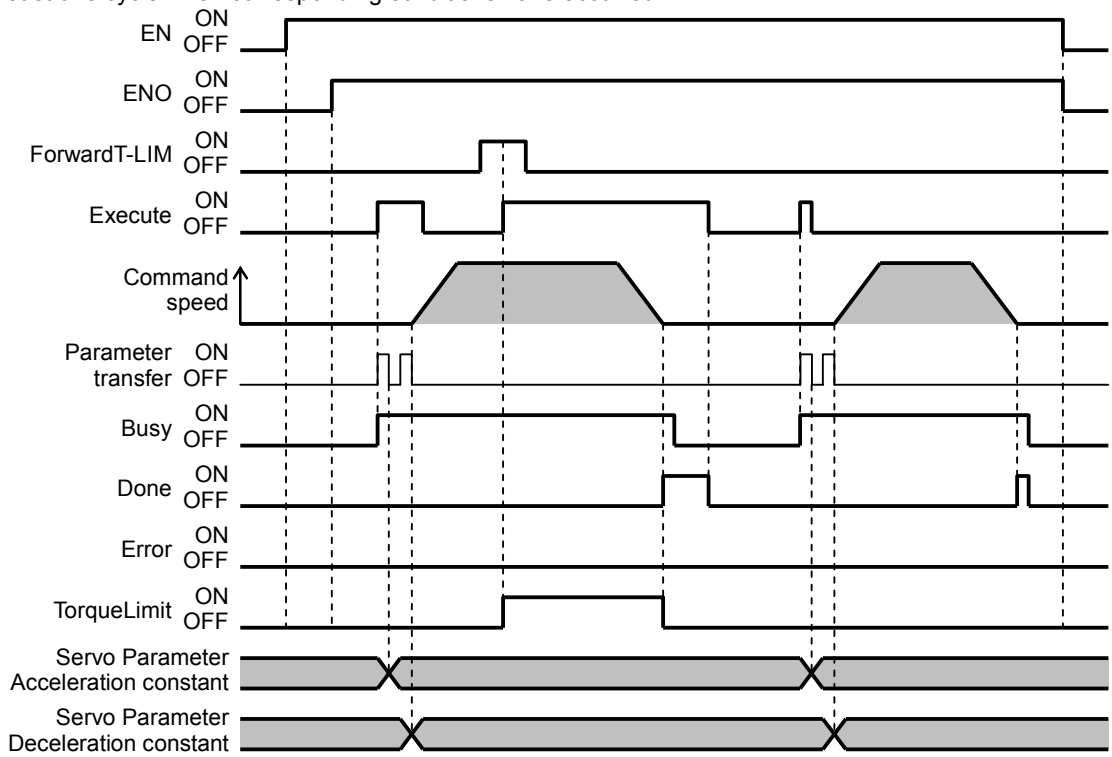
| NCF 022C | Move Relative with Torque-limit (REAL) _NCF022C_MoveRelative2_REAL |
|---|---|

| | |
|---|---|
| **Basic function** | Executes positioning with the relative movement during torque control. (Acceleration/Deceleration time setting, Busy attachment) |
| **Symbol** |  |
| **File name** | Lib\FBL\omronlib\PositionController\NCF_NCF022C_MoveRelative2_REAL10.cxf |
| **Applicable models** | Position Control Unit: CJ1W-NCF71, CS1W-NCF71<br>CPU Unit: CS1*-CPU**H Unit Version 3.0 or later<br>CJ1*-CPU**H Unit Version 3.0 or later<br>CJ1M-CPU** Unit Version 3.0 or later<br>CP1H<br>CX-Programmer: Version 5.0 or later |
| **Languages in function block definitions** | Ladder programming |
| **Conditions for usage** | The following conditions for usage should be the Position Control Unit version 1.2 or earlier.<br>(It will not be required in the Position Control Unit version 1.3 or later)<br>■CX-Programmer Setting<br>The function blocks related to the Position Control Units will not operate if the area H512 or higher (default setting) is specified as the Non Retain Area through the Function block memory allocation. Make sure to change the memory area to unused area (DM or EM, for example) from the CX-Programmer. To change this value, click ***PLC/Function Block Memory/Function Block Memory Allocation*** from the Menu Bar. |




For example, to use the memory area from D32020 to D32767 (748 words), specify the addresses as shown in the left.

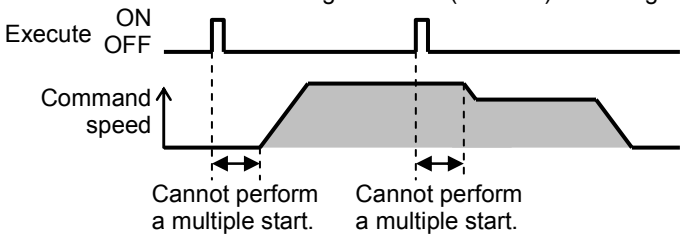
| | |
|---|---|
| **Function description** | The acceleration/deceleration time setting and Busy Output are added to the _NCF022_MoveRelative2_REAL in this FB.<br>When the Start (Execute) turns ON, a positioning operation for the axis of the specified Unit No. (UnitNo) and Axis No. (Axis) is started using the specified Position command (Distance) and Speed command (Velocity), Acceleration time (Acceleration) and Deceleration time (Deceleration).<br>When the Start (Execute) turns ON, the value set in Acceleration time (Acceleration) and Deceleration time (Deceleration) is written to “Acceleration constant” and “Deceleration constant” using the Transferring Servo Parameter function. Refer to the *Restrictions Other* for the details of Servo Parameter “Acceleration constant” and “Deceleration constant”.<br>Changing the Speed command (Velocity) during positioning by this FB will change the actual operation speed.<br>If Start (Execute) is turned ON with Forward torque limit (ForwardT-LIM) or Reverse torque limit (ReverseT-LIM) set, the torque limit values set in the Servo Parameters (Refer to the *Restrictions Other*) will be enabled.<br>When Start (Execute) is turned ON during axis operation, multistart can be performed. At this time, the setting of Acceleration time (Acceleration) and Deceleration time (Deceleration) is not reflected.<br>The Positioning completed (Done) is turned ON when the positioning operation for the FB has been completed. This flag will not be turned ON if the positioning operation is canceled because another operation has been started from a different instance, for a deceleration stop, or because an error has occurred.<br>The Busy flag (Busy) will be set when the Start (Execute) is turned ON.<br>The Busy flag (Busy) will be reset when any of the Positioning completed (Done), Abort (CommandAborted), or Error flag (Error) is turned ON.<br>Even if an error occurs when the input variable is out of the range, etc., the Busy flag (Busy) will be set for at least one cycle.<br>The Error flag (Error) will be turned ON and the Error code (ErrorID) will be output if an error occurs for the FB. This will not occur for error in other FBs or other instances of the FB.<br>Torque limit (TorqueLimit) will be turned ON while the output torque is being limited by the torque limits.<br>These statuses (Done/CommandAborted/Error/ErrorID) will be reset when the Start (Execute) turns OFF. If the Start (Execute) turns OFF before the positioning operation has been completed, the status will be set for at least one cycle when corresponding conditions have occurred.<br>  <br> |
| **Kind of FB definition** | Always execution type.<br>Connect the EN input to the Always ON Flag (P_On).<br>The same instance cannot be used in two or more places. |
| **FB precautions** | ・Executing this FB during the positioning operation will cause a duplicate start. Positioning operation will be performed at the distance set in Position command (Distance) from the point at which the last execution was started. Refer to the *Related Manuals* for details. |
| **EN input condition** | ・Connect the EN input to the Always ON Flag (P_On).<br>If another bit is connected to EN, the FB outputs will be held when the connected bit turns OFF. |

**Restrictions Other**

・The torque command value at torque limit can be set with the following Servo Parameters.
Setting of “Torque limit selections” is required to use G-Series Servo Drives. Torque limit functions do not operate if the setting is incorrect.

| Drive | PRM No. | Parameter name | Size | Unit | Setting range | Set value |
|---|---|---|---|---|---|---|
| W-Series | Pn404 | Forward rotation external current limit | 2 | % | 0 to 800 | Arbitrary value |
| | Pn405 | Reverse rotation external current limit | 2 | % | 0 to 800 | Arbitrary value |
| G-Series | Pn003 | Torque limit selection | 2 | % | 1 to 5 | 3:Switch limit by input signals |
| | Pn05F | No.2 torque limit | 2 | % | 0 to 500 | Arbitrary value |

・A multiple start cannot be performed by the same instance until the Positioning command is accepted by the Position Control Unit. Turning ON “Start (Execute)” will be ignored.




・Changing the Speed command (Velocity) during positioning by this FB will change the actual operation speed. However, the speed will not be changed if the Speed command (Velocity) is less than -2.147483e+009 or exceeds +2.147483e+009.

Ex.1) When changing the Speed command value +1000.0(+1000) to +2.147483e+009 during the operation: The speed command value for the Position Control Unit is changed to +2.147483e+009(+2147483000). Some Position Control Units may cause an error.

Ex.2) When changing the Speed command value +1000.0(+1000) to +2.147484e+009 during the operation: The Speed command value for the Position Control Unit remains +1000.0(+1000) without any change.

・The Acceleration/deceleration constants are calculated based on “Speed command (Velocity)” “Acceleration time (Acceleration)” and “Deceleration time (Deceleration)” in this FB. If the calculated value is out of Servo Parameter range, it will be adjusted to be within the range (1 to 65535). In this case, the specified acceleration/deceleration time may be altered.

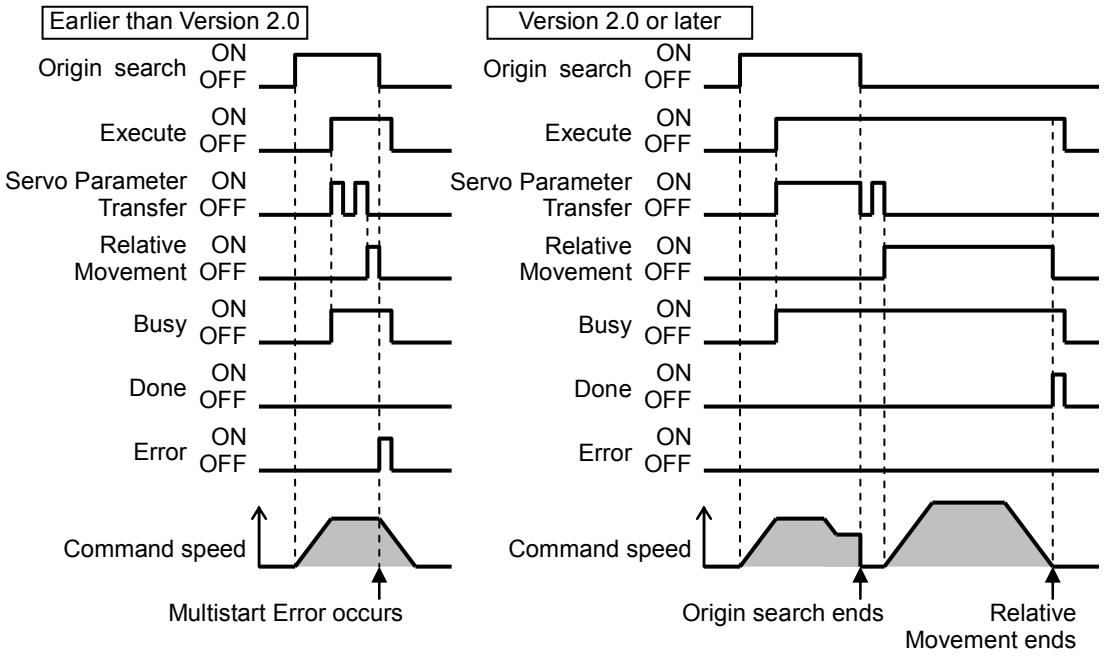
(Reference) Acceleration/Deceleration constant setting range of Servo Drive

| Drive | PRM No. | Parameter name | Size | Unit | Setting range |
|---|---|---|---|---|---|
| W-Series | Pn80B | Second-step linear acceleration constant | 2 | ×10000 command units/$s^2$ | 1 to 65535 |
| | Pn80E | Second-step linear deceleration constant | 2 | ×10000 command units/$s^2$ | 1 to 65535 |
| G-Series | Pn107 (80B) | Linear Acceleration constant | 2 | ×10000 command units/$s^2$ | 0 to 65535 (Note) |
| | Pn10A (80E) | Linear deceleration constant | 2 | ×10000 command units/$s^2$ | 0 to 65535 (Note) |

(Note) Setting 0 automatically changes to 1.

・The following cannot be specified for this FB: “Acceleration/deceleration curve designation”. If any of these functions is required, specify them in advance outside the FB.
・This FB may act differently according to unit versions of the Position Control Units when executing this FB during the Origin Search operation.

| | |
|---|---|
| Earlier than 2.0 | A Multistart error occurs right after parameters are transferred. Do not execute this FB during the Origin search operation. |
| 2.0 or later | The parameter transferring status is hold until the Origin search is completed. After the completion, the Move Relative command is executed. |

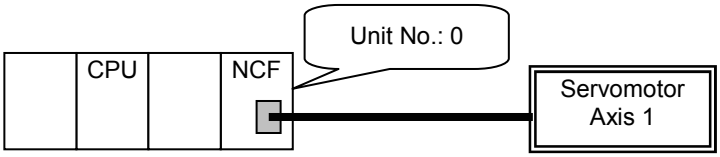


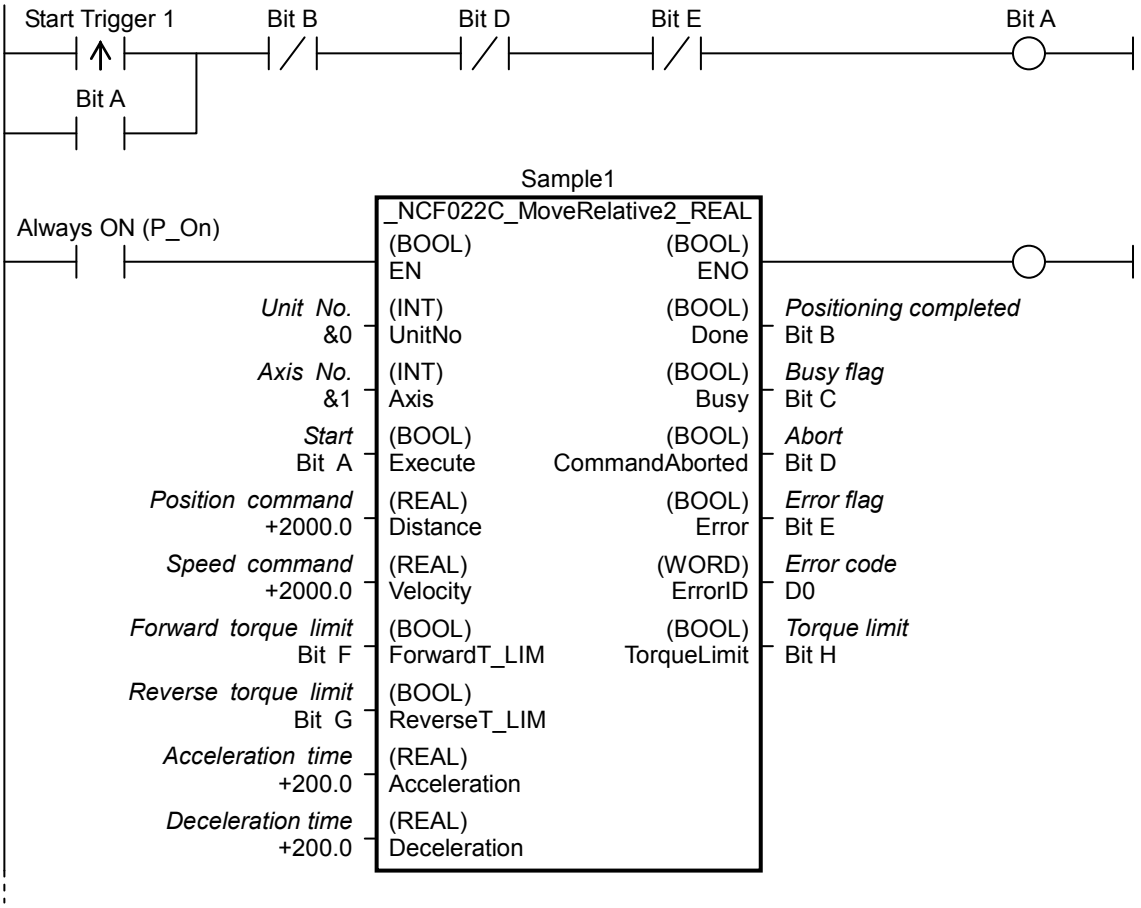

・This FB uses Unit Error Reset, Write Data, Read Data and Save Data Bits of the Position Control Unit (see Note). Therefore, do not turn these bits ON or OFF between the period from the rising edge of EN to the rising edge of ENO. For the same reason, do not use these bits for coil outputs (OUT commands).
・The output variable of FB may not change even if EN is turned ON. In that case, check if any of Unit Error Reset, Write Data, Read Data and Save Data Bit is left ON.
・This FB uses the Relative Movement Bit in the Axis Operating Output Memory Areas. Therefore, do not turn these bits ON or OFF until the operation is completed. For the same reason, do not use these bits for coil outputs (OUT commands).
・Starting this FB while the Interrupt Feeding Bit of Axis Operating Output Memory Areas is ON will cause an error.

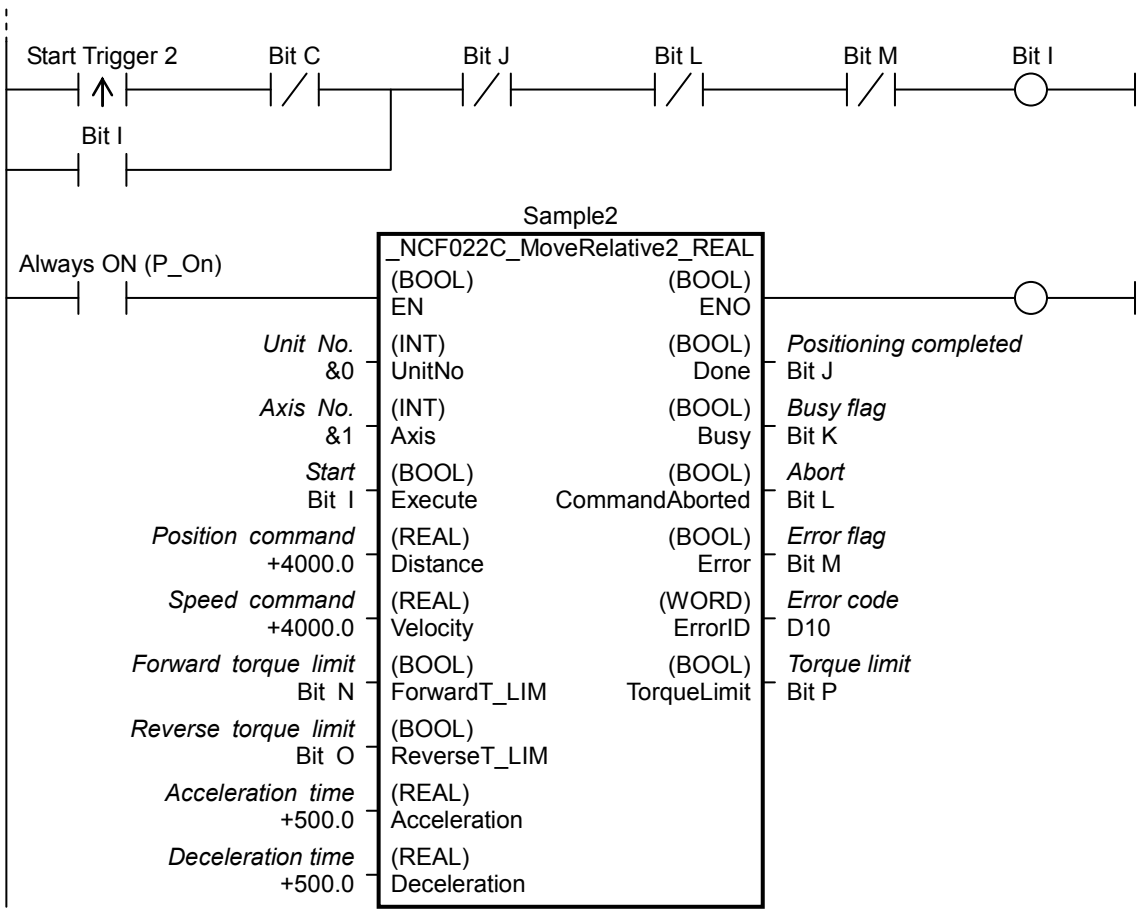
Note:
For calculation of bit addresses, these bits are referenced in this FB in the first execution of each instance, and when changing "Unit No. (UnitNo)", "Axis No. (Axis)" of the input variable and set "Start (Execute) ".

**Application example**

Turning the Start Trigger 1 ON from OFF will operate the Servomotor (axis1) connected to the Position Control Unit with a unit number 0 using the Move Relative command during torque control.
The Busy flag(Busy) can be used for not to operate the FB of the “Sample2” during the FB operation of the “Sample1”






| | |
|---|---|
| **Related manuals** | Position Control Units OPERATION MANUAL (W426-E1)<br>5-3 Transferring Servo Parameters<br>SECTION 9 Positioning<br>10-4 Torque Limits<br>12-4 Error Codes |

**■Variable Tables**

**Input Variables**

| Name | Variable name | Data type | Default | Range | Description |
|---|---|---|---|---|---|
| EN | EN | BOOL | | | 1 (ON): FB started<br>0 (OFF): FB not started |
| Unit No. | UnitNo | INT | &0 | &0 to &15 | Specify the unit number. |
| Axis No. | Axis | INT | &1 | &1 to &16 | Specify the axis number. |
| Start | Execute | BOOL | 0(OFF) | | ⊥↑: Starts the relative move. |
| Position command | Distance | REAL | +0.0 | -2.147483e+009 to +2.147483e+009 | Specify the distance for relative movement.<br>Unit: Command units/s |
| Speed command | Velocity | REAL | +0.0 | +0.0 to +2.147483e+009 | Specify the target speed.<br>Unit: Command units/s<br>Changing the value while this FB is in operation will change the actual operating speed. |
| Forward torque limit | ForwardT_LIM | BOOL | 0(OFF) | | Specify the torque limit in forward direction. |
| Reverse torque limit | ReverseT_LIM | BOOL | 0(OFF) | | Specify the torque limit in reverse direction. |
| Acceleration time | Acceleration | REAL | +0.0 | +0.0 to +65535.0 | Specify the acceleration time for the speed specified in “Speed command (Velocity)”.<br>Unit: ms |
| Deceleration time | Deceleration | REAL | +0.0 | +0.0 to +65535.0 | Specify the deceleration time for the speed specified in “Speed command (Velocity)”.<br>Unit: ms |

**Output Variables**

| Name | Variable name | Data type | Range | Description |
|---|---|---|---|---|
| ENO | ENO | BOOL | | 1 (ON): FB operating normally<br>0 (OFF): FB not operating normally<br>・FB not started<br>・Input variable out of the range<br>・FB ended with error<br>・Common Parameters could not be read |
| Positioning completed | Done | BOOL | | Turns ON when the positioning operation has been completed. |
| Busy flag | Busy | BOOL | | 1 (ON) indicates that the FB is in progress. |
| Abort | CommandAborted | BOOL | | 1 (ON): Aborted<br>It will be aborted when any of the following conditions is met during operation<br>・Turns ON when the other Move command done (Duplicate Move).<br>・Stopped with Decleration Stop or Emergency Stop.<br>・Executed Servo Unlock, Deviation Counter Reset on an operating axis.<br>・Attempted to execute FB while Servo Unlock, Deceleration Stop, Emergency Stop or Deviation Counter Reset Bit is ON.<br>・Detected the Stop Execution Flag is ON.<br>・The Relative Movement Bit is changed by the other FB during Relative Movement in operation. |
| Error flag | Error | BOOL | | Turns ON when an error has occurred in the FB. |
| Error code | ErrorID | WORD | | Returns the error code when an error has occurred in the FB. Refer to the *Related Manuals* for details on errors.<br>A code of #0000 will be returned if any of the following conditions is satisfied.<br>・Input variable is out of range.<br>・The common parameters of the Position Control Units are out of range.<br>・Not established communications with a specified axis.<br>・The Interrupt Feeding Bit of Axis Operating Output Memory Areas is ON before Relative Movement is executed by this FB.<br>・The Write Servo Parameter Bit is changed by the other FB during writing Servo parameters. |
| Torque limit | TorqueLimit | BOOL | | 1(ON) indicates that output torque is being limited. |

**■Version History**

| Version | Date | Contents |
|---|---|---|
| 1.01 | 2007.11. | Original production |

**■Note**

This document explains the function of the function block.
It does not provide information of restrictions on the use of Units and Components or combination of them. For actual applications, make sure to read the operation manuals of the applicable products.