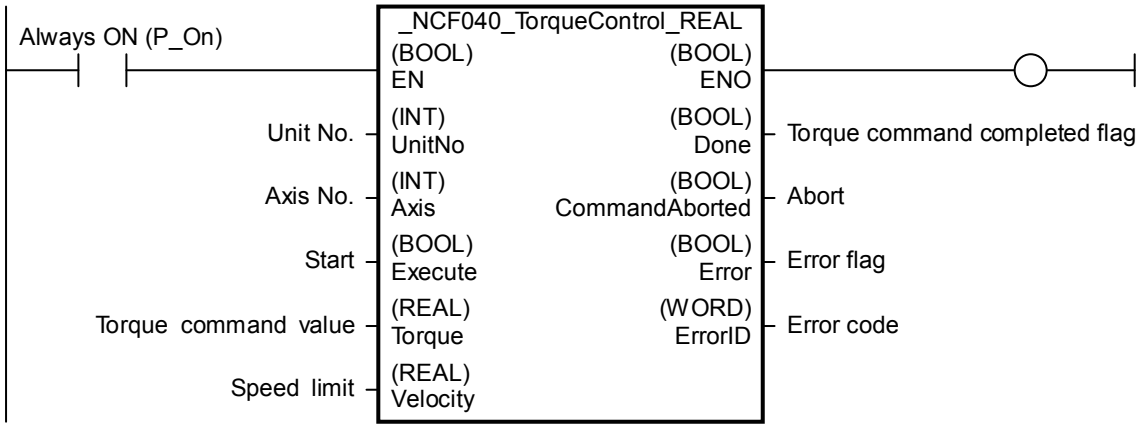
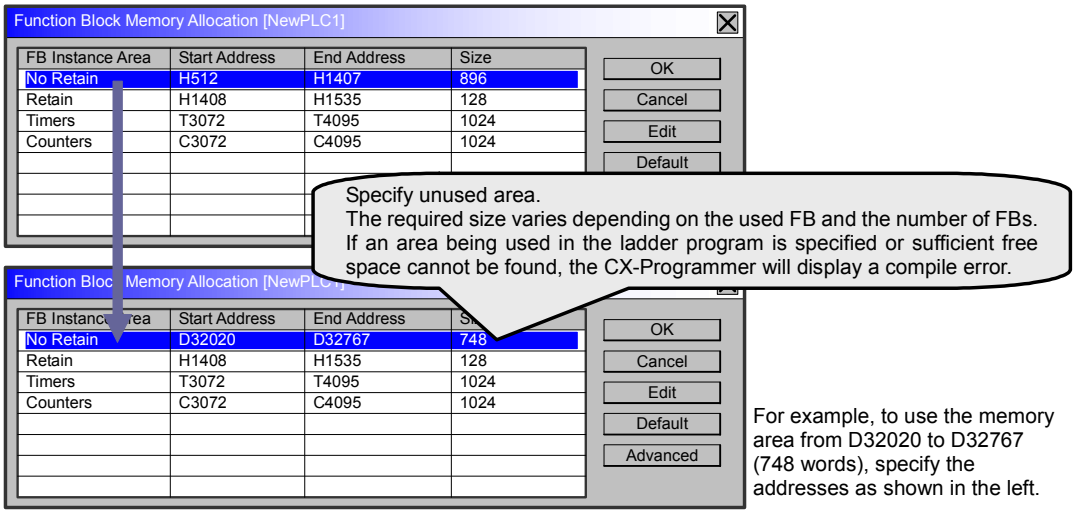
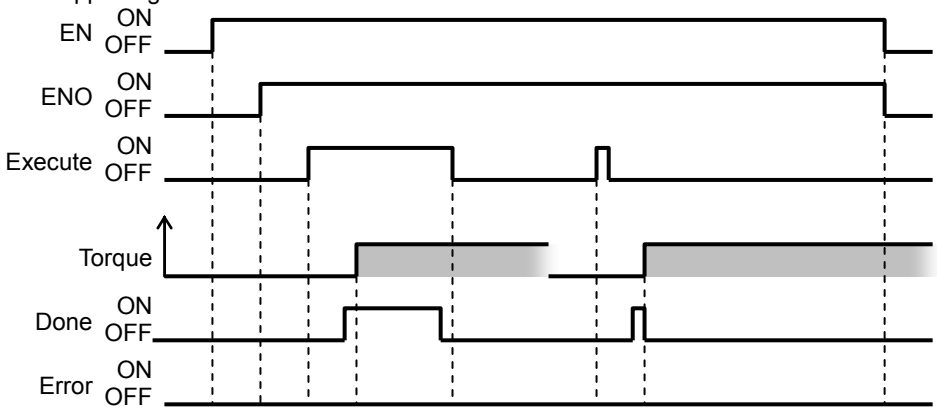
NCF 040	Torque Control (REAL) _NCF040_TorqueControl_REAL

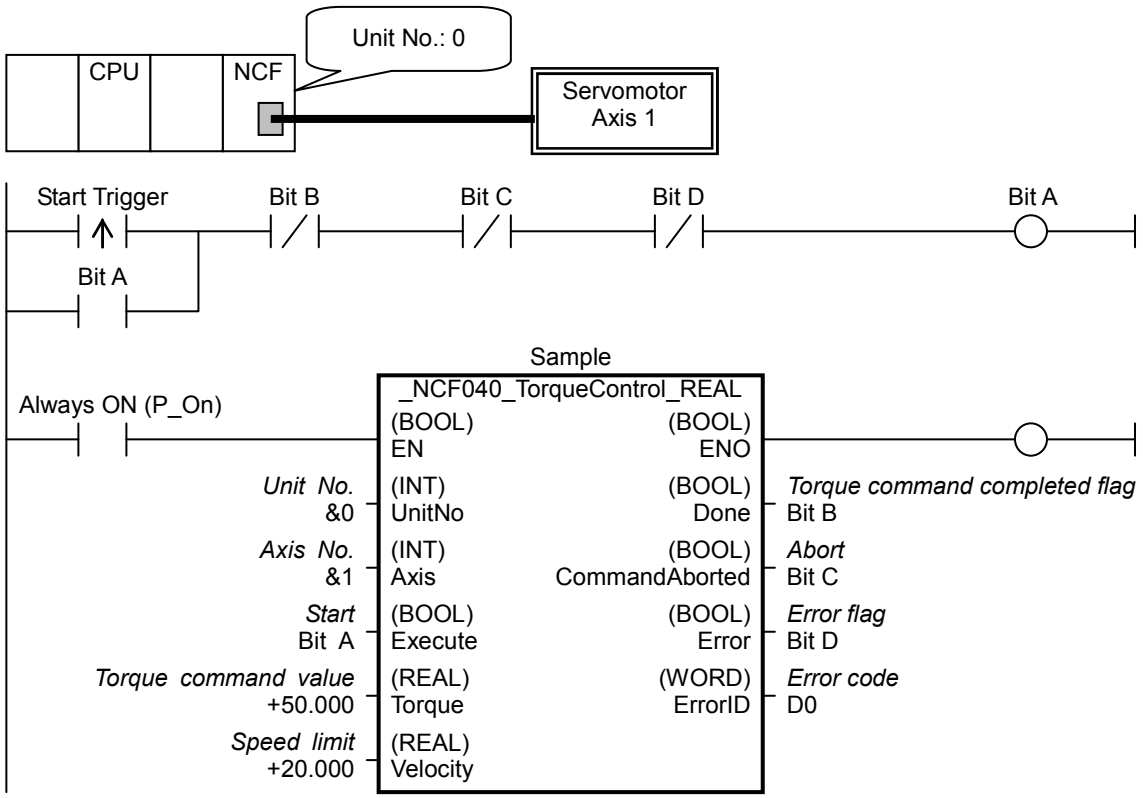
Basic function	Controls the torque.	
Symbol		
File name	Lib\FBL\omronlib\PositionController\NCF_NCF040_TorqueControl_REAL11.cxf	
Applicable models	Position Control Unit	CJ1W-NCF71, CS1W-NCF71
	CPU Unit	CS1*-CPU**H Unit Version 3.0 or later CJ1*-CPU**H Unit Version 3.0 or later CJ1M-CPU** Unit Version 3.0 or later CP1H
	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. (It will not be required in the Position Control Unit version 1.3 or later) ■CX-Programmer Setting 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	When the Start (Execute) turns ON, the Torque Control for the axis of the specified Unit No. (UnitNo) and Axis No. (Axis) is started using the specified Torque command value(Torque). The Speed limit (Velocity) can be used to specify the maximum speed during torque control. Changing the value of Torque command value(Torque) during the torque control by this FB will change the actual operation speed. The value of Torque command value(Torque) can be reflected while the Start (Execute) is turned ON even after the Torque command has been completed. The Torque command completed flag (Done) is turned ON when the Torque command value(Torque) in this FB has been accepted normally by the Servo Drive. 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. These statuses (Done/CommandAborted/Error/ErrorID) will be reset when the Start (Execute) turns OFF. If the Start (Execute) turns OFF before the operation has been completed, the status will be set for at least one cycle when supporting conditions have occurred. 
Kind of FB definition	Always execution type. Connect the EN input to the Always ON Flag (P_On). The same instance cannot be used in two or more places.
FB precautions	・Turning ON the Start (Execute) again after the Torque command has been completed will cause a multiple start and the torque control will be performed for the torque set in Torque command value(Torque) then. Refer to the Related Manuals for details.
EN input condition	・Connect the EN input to the Always ON Flag (P_On). If another bit is connected to EN, the FB outputs will be held when the connected bit turns OFF.
Restrictions Other	・Changing the Torque command value(Torque) while the Start (Execute) is ON after the Torque command has beem completed will change the actual operation speed. However, the speed will not be changed if the Torque command value(Torque) is less than -2.147483e+006 or exceeds +2.147483e+006. Ex.1) When changing the Torque command value +100.000(+100%) to +2.147483e+006 during the operation: The Torque command value for the Position Control Unit is changed to +2.147483e+006(+2147483%). Some Position Control Units may cause an error. Ex.2) When changing the Torque command value +100.000(+100%) to +2.147484e+006 during the operation: The Torque command value for the Position Control Unit remains +100.0(+100%) without any change. ・The Torque command value(Torque) can be reflected while the Start (Execute) is turned ON even after the Torque command has been competed. At that time, if more than one instance is executed, they will be operated with the command value of instance located in the bottom. ・The following cannot be specified for this FB: “Forward rotation current limit designation” and “Reverse rotation current limit designation”. If any of these functions is required, specify them in advance outside the FB. ・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 Torque Control 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). 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 ON from OFF will operate the Servomotor (axis1) connected to the Position Control Unit with a unit number 0 using the Torque Control command.
Related manuals	Position Control Units OPERATION MANUAL (W426-E1) 10-6 Torque Control 12-4 Error Codes



■Variable Tables

Input Variables

Name	Variable name	Data type	Default	Range	Description
EN	EN	BOOL			1 (ON): FB started 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 speed control.
Torque command value	Torque	REAL	+0.0	-199.999 to +199.999	Specify the target torque. The unit is % of the momentary max torque of the motor being used. Changing the value while this FB is in operation will change the actual torque command value.
Speed limit	Velocity	REAL	+0.0	+0.0 to +100.000	Specify the speed limit. The unit is % of the maximum speed of the motor being used. This value can be used as Speed limit value during torque control with the setting of Servo Parameter. W-Series: Pn002.1 --- Speed Command Input Change in Parameter Function Selection Application Switch 2 G-Series: Pn05B --- Speed limit selection Refer to the manual written on the *Related Manuals* for the details.

Output Variables

Name	Variable name	Data type	Range	Description
ENO	ENO	BOOL		1 (ON): FB operating normally 0 (OFF): FB not operating normally ・FB not started ・Input variable out of the range ・FB ended with error ・Common Parameters could not be read
Torque command completed flag	Done	BOOL		Turns ON when the torque command has been accepted.
Abort	CommandAborted	BOOL		1 (ON): Aborted It will be aborted when any of the following conditions is met during operation ・Turns ON when the other Move command done (Duplicate Move). ・Stopped with Decleration Stop or Emergency Stop. ・Executed Servo Unlock, Deviation Counter Reset on an operating axis. ・Attempted to execute FB while Servo Unlock, Deceleration Stop, Emergency Stop or Deviation Counter Reset Bit is ON. ・Detected the Stop Execution Flag is ON. ・The Torque Control Bit is changed by the other FB during Torque Control 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. A code of #0000 will be returned if any of the following conditions is satisfied. ・Input variable is out of range. ・The common parameters of the Position Control Units are out of range. ・Not established communications with a specified axis.

■Version History

Version	Date	Contents
1.00	2004.06.	Original production
1.10	2005.01.	Limitation about the setting timing with " Unit No. " and " Axis No. " was removed.

■The detailed contents of the upgrading

Version	Detailed Contents
1.10	In version 1.00, " Unit No. " and " Axis No. " must be set when EN was ON and " Start (Execute) " was OFF. This means not sometimes working normally when " Unit No. " and " Axis No. " are changed simultaneously with ON of " Start (Execute) ". In version 1.10, this limitation was removed.

■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.