

16 HIGH-SPEED COUNTER INSTRUCTION

16.1 High-speed Processing Instruction

Setting 32-bit data comparison

DHSCS

FX5S FX5UJ FX5U FX5UC

This instruction compares the value counted by a high-speed counter with a specified value, and immediately sets a bit device if the two values are equivalent to each other.

The high-speed pulse input/output module is not supported.

Ladder diagram	Structured text ^{*1}
	ENO:=DHSCS(EN,s1,s2,d); ENO:=DHSCS_I(EN,s1,s2,Pn);

FBD/LD ^{*1}

*1 When the interrupt pointer (I) is specified in operand (d) by ST language and the FBD/LD language, use the DHSCS_I instruction.

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Setting data

■Descriptions, ranges, and data types

Operand	Description	Range	Data type	Data type (label)
(s1)	Data to be compared with the current value of a high-speed counter or word device number storing the data to be compared	-2147483648 to +2147483647	32-bit signed binary	ANY32
(s2)	Channel number of a high-speed counter	K1 to 8	32-bit signed binary	ANY32
(d) DHSCS DHSCS_I ^{*1}	Bit device number to be set to ON when the compared two values are equivalent to each other	—	Bit	ANY_BOOL
			—	POINTER
EN	Execution condition	—	Bit	BOOL
ENO	Execution result	—	Bit	BOOL

*1 In the case of the ST language and the FBD/LD language, d displays as Pn.

■Applicable devices

Operand	Bit	Word			Double word		Indirect specification	Constant			Others (I)
		X, Y, M, L, SM, F, B, SB, S	T, ST, C, D, W, SD, SW, R	U□\G□	Z	LC		K, H	E	\$	
(s1)	○	○	○	○	○	○	○	○	—	—	—
(s2)	○	○	○	○	○ ^{*1}	○	○	○	—	—	—
(d)	○	—	—	—	—	—	—	—	—	—	○ ^{*2}

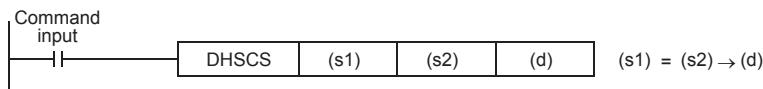
*1 Enable the FX3 compatible function, and specify a device between LC35 and 55 that is designated as an FX3 compatible high-speed counter.

For FX3 compatible function, refer to [MELSEC iQ-F FX5 User's Manual \(Application\)](#).

*2 I16 to I23 can be used.

Processing details

- When the current value of a high-speed counter of the channel specified in (s2) becomes the comparison value (s1) (for example, when the current value changes from "199" to "200" or from "201" to "200" if the comparison value is K200), the bit device (d) is set to ON regardless of the scan time. In this instruction, the comparison processing is executed after the count processing in the high-speed counter. For details, refer to [MELSEC iQ-F FX5 User's Manual \(Application\)](#).

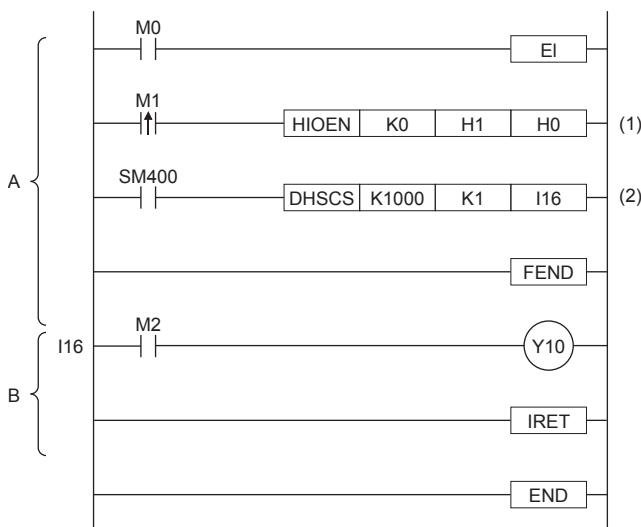


Point

Use DHSCS if the output should be given when the counting result becomes equivalent to the comparison value regardless of the scan time of the CPU module.

When the number of instructions that can be simultaneously used is exceeded, use a general-purpose comparison instruction.

If using the high-speed comparison match interrupt, the corresponding interrupt programs can be executed by setting the interrupt pointers (I16 to I23) to (d) as shown below.



A: Main routine program

B: I16 Interrupt Program

(1): Start the high-speed counter CH1.

(2): When the current value of the high-speed counter CH1 reaches 1000, the interrupt program (I16) is executed.

Precautions

The value specified in (s2) should only be the channel of high-speed counter number (1 to 8) set by the parameter.

An operation error occurs in the following cases.

- When a channel which is not set by the parameter or a value other than K1 to 8 is specified
- When an LC device number which is not set by the parameter is specified

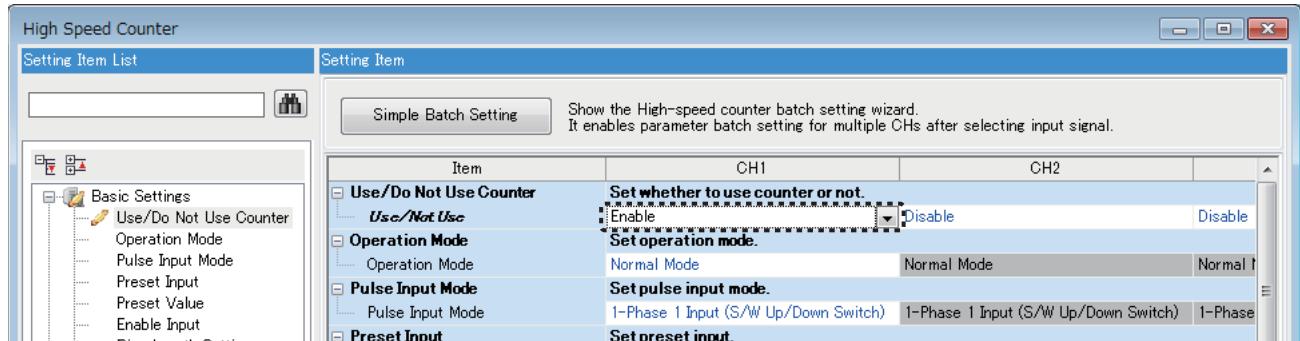
For other precautions, refer to [MELSEC iQ-F FX5 User's Manual \(Application\)](#).

Program example

- Parameter

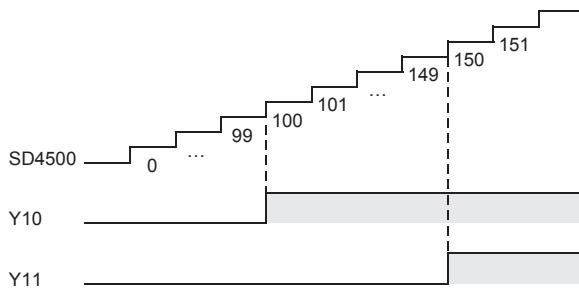
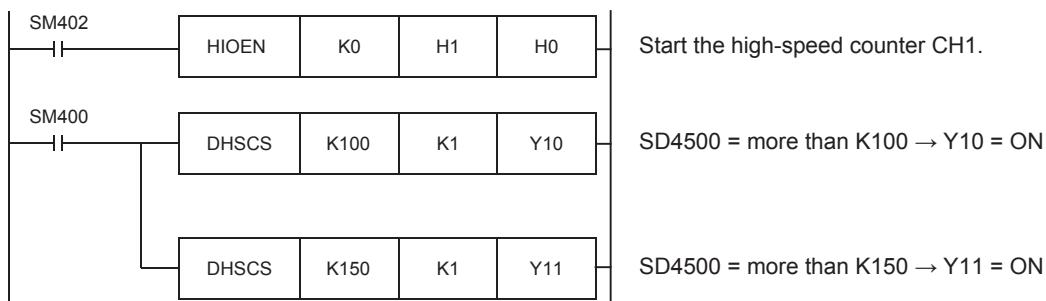
When using the data comparison by the high-speed counter, set "Use/Do Not Use Counter" of CH1 to "Enable" with the following parameter.

Navigation window \Rightarrow [Parameter] \Rightarrow Module model name \Rightarrow [Module Parameter] \Rightarrow [High Speed I/O] \Rightarrow "Input Function" \Rightarrow "High Speed Counter" \Rightarrow "Detailed Setting" \Rightarrow "Basic Settings"



- Program

In the program example shown below, with regard to the current value of a counter, different outputs (Y10 and Y11) are arbitrarily set to ON by two values.



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Operation error

Error code (SD0/SD8067)	Description
1810H	The channel specified by instructions using communication functions or built-in I/O is already used by other instructions.
2820H	A device used as an instruction operand is outside the allowable device range.
3405H	A channel number LC device, or device (I) number outside the range is specified.
3582H	The DHSCS instruction is executed in an interrupt program
3600H	A channel number for which the channel setting is not set is specified in the operand for channel number specification of the high-speed counter.
3780H	The DHSCS, DHSCR, and DHSZ instructions are used exceeding the maximum limit of the number of these instructions.