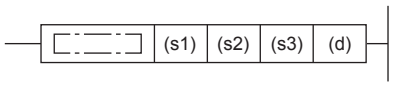
Comparison of 32-bit data band

DHSZ

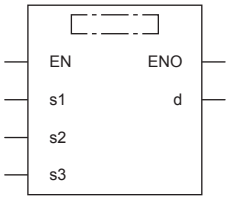
FX5S FX5UJ FX5U FX5UC

This instruction compares the current value of a high-speed counter with two values (one zone), and outputs the comparison result (refresh).

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

Ladder diagram	Structured text
	ENO:=DHSZ(EN,s1,s2,s3,d);

FBD/LD



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 data to be compared (comparison value 1)	-2147483648 to +2147483647	32-bit signed binary	ANY32
(s2)	Data to be compared with the current value of a high-speed counter or word device number storing data to be compared (comparison value 2)	-2147483648 to +2147483647	32-bit signed binary	ANY32
(s3)	Channel number of a high-speed counter	K1 to 8	32-bit signed binary	ANY32
(d)	Head bit device number to which the comparison result is output based on the comparison value 1 and the comparison value 2	—	Bit	ANYBIT_ARRAY (Number of elements: 3)
EN	Execution condition	—	Bit	BOOL
ENO	Execution result	—	Bit	BOOL

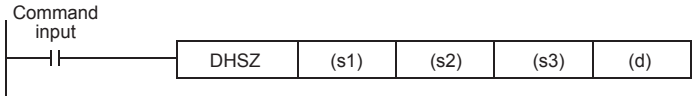
■Applicable devices

Operand	Bit	Word			Double word		Indirect specification	Constant			Others
	X, Y, M, L, SM, F, B, SB, S	T, ST, C, D, W, SD, SW, R	U□\G□	Z	LC	LZ		K, H	E	$	
(s1)	○	○	○	○	○	○	○	○	—	—	—
(s2)	○	○	○	○	○	○	○	○	—	—	—
(s3)	○	○	○	○	○*1	○	○	○	—	—	—
(d)	○	—	—	—	—	—	—	—	—	—	—

*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).

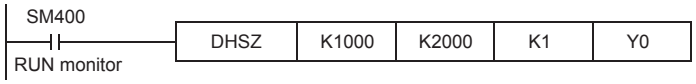
Processing details

- The current value of a high-speed counter specified in (s3) is compared with two comparison points (comparison value 1 and comparison value 2). Based on the zone comparison result, "smaller than the lower comparison value", "inside the comparison zone" or "larger than the upper comparison value", one among (d), (d)+1 and (d)+2 is set to ON regardless of the scan time. For details, refer to MELSEC iQ-F FX5 User's Manual (Application).



(s1) > (s3) → (d)
(s1) ≤ (s3) ≤ (s2) → (d) +1
(s3) > (s2) → (d) +2

- Make sure that the comparison value 1 and the comparison value 2 have the following relationship: [Comparison value 1] ≤ [Comparison value 2]. When the setting differs from the above, an operation error occurs and the DHSZ instruction will not perform any operation.
- When the current value of the high-speed counter CH1 changes (counts) as shown below, the comparison result is turn on to one of the outputs Y0, Y1 or Y2.



ON
K1000 > CH1 current value → Y0
K1000 ≤ CH1 current value ≤ K2000 → Y1
CH1 current value > K2000 → Y2

Comparison pattern	Current value of CH1 (s3)	Change of output contact (Y)		
		Y0	Y1	Y2
(s1)>(s3)	1000>(s3)	ON	OFF	OFF
	999→1000	ON→OFF	OFF→ON	OFF
	1000→999	OFF→ON	ON→OFF	OFF
(s1) ≤ (s3) ≤ (s2)	999→1000	ON→OFF	OFF→ON	OFF
	1000→999	OFF→ON	ON→OFF	OFF
	1000 ≤ (s3) ≤ 2000	OFF	ON	OFF
	2000→2001	OFF	ON→OFF	OFF→ON
	2001→2000	OFF	OFF→ON	ON→OFF
(s3)>(s2)	2000→2001	OFF	ON→OFF	OFF→ON
	2001→2000	OFF	OFF→ON	ON→OFF
	(s3)>2000	OFF	OFF	ON

Point

It is used when 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.

Precautions

An operation error occurs in the following cases.

- When a channel which is not set to (s3) 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

Three devices are occupied from the device specified in (d). Make sure that these devices are not used in other controls.
When designating a Y device, do not set a device that crosses over a module or a device No. that is a multiple of 16

Ex.

Example: Designating Y36 or Y37 when using FX5U-64M□.

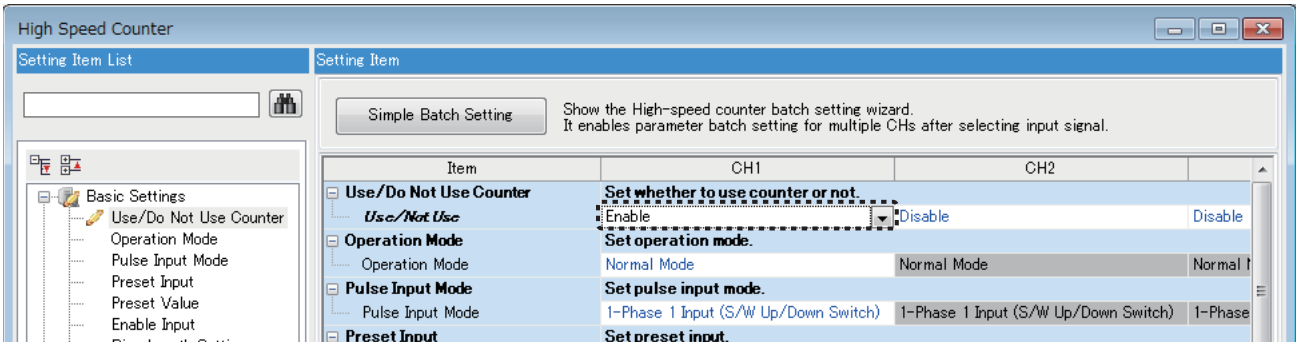
For other precautions, refer to MELSEC iQ-F FX5 User's Manual (Application).

Program example

• Parameter

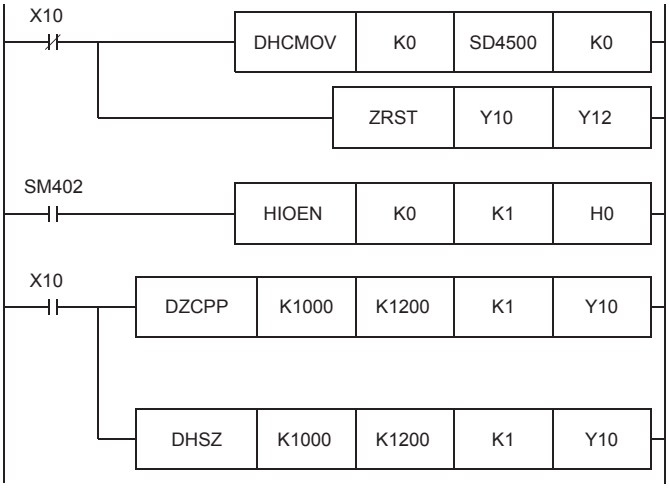
When using the data band comparison by the high-speed counter, set "Use/Do Not Use Counter" of CH1 to "Enable" with the following parameter.

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



• Program

In the program shown below, the data range (K1000 to K1200) specified for the current value of the counter is compared, and the output (Y10 to Y12) is set (ON) according to the comparison results.



Y10 to Y12 are reset.

Start the high-speed counter CH1.

When X10 turns ON, comparison is executed only once.
K1000>SD4500 : Y10 ON
K1000≤SD4500≤K1200 : Y11 ON
K1200<SD4500 : Y12 ON

When X10 turns ON, comparison is executed when each pulse is input from X0.
K1000>SD4500 : Y10 ON
K1000≤SD4500≤K1200 : Y11 ON
K1200<SD4500 : Y12 ON

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	The number of devices is insufficient.
3405H	A channel number or LC device outside the range is specified.
	The comparison value 1 is greater than the comparison value 2.
3582H	The DHSZ 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.