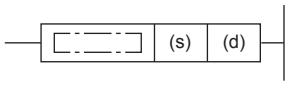
# Bit check of 16-bit data

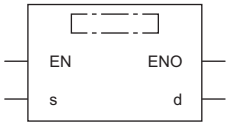
## SUM(P)

FX5S FX5UJ FX5U FX5UC

These instructions store the total bits of 1 in the binary 16-bit data of the device specified by (s) to the device specified by (d).

| Ladder diagram | Structured text |
|---|---|
|  | ENO:=SUM(EN,s,d);<br>ENO:=SUMP(EN,s,d); |

**FBD/LD**




### Setting data

#### ■Descriptions, ranges, and data types

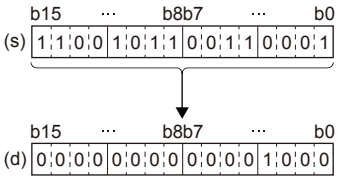
| Operand | Description | Range | Data type | Data type (label) |
|---|---|---|---|---|
| (s) | Head device number that counts the total bits of 1 | — | 16-bit signed binary | ANY16 |
| (d) | Head device number storing the total bits | — | 16-bit signed binary | ANY16 |
| EN | Execution condition | — | 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 | $ | |
| (s) | ○ | ○ | ○ | ○ | — | — | ○ | ○ | — | — | — |
| (d) | ○ | ○ | ○ | ○ | — | — | ○ | — | — | — | — |

### Processing details

- These instructions store the total bits of 1 in the binary 16-bit data of the device specified by (s) to the device specified by (d).




The total of 1 is stored in the binary data. (In the example shown on the left, the total is 8.)

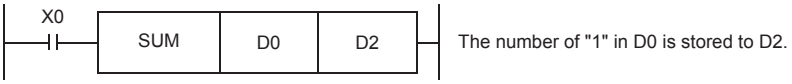
- When all binary 16-bit data of the device specified by (s) are 0 (off), the zero flag (SM8020) turns on.

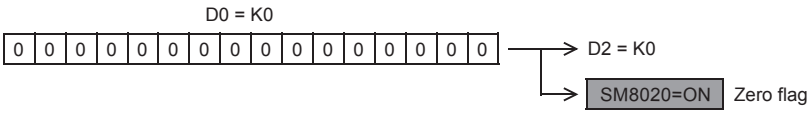
### Precautions

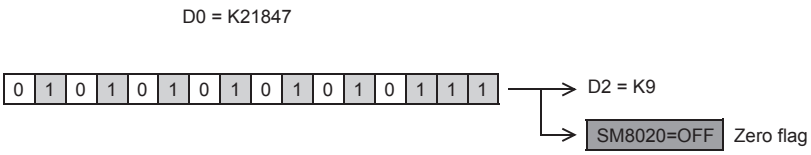
While the command input is off, the instruction is not executed. The output of the number of bits in the on status is latched in the previous status.

## Program example

In the program example shown below, when X0 is ON, the number of bits in the ON status in D0 is counted, and stored to D2.




## Operation error

There is no operation error.