Batch-reading the status of steps
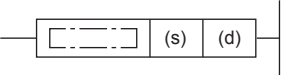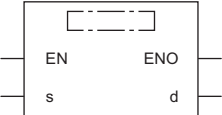
MOV(P) [KnS□/BL□\KnS□]

FX5S FX5UJ FX5U FX5UC

These instructions batch-read (in units of 16-bit binary data) the status (active or inactive) of steps in the specified block, and store the read data in the specified device. (Kn: K1 to K4)

Ladder diagram	Structured text
▯◌◌◌◌▯ (s) (d)	ENO:=MOV(EN,s,d); ENO:=MOVP(EN,s,d);

FBD/LD
▯◌◌◌▯ EN   ENO s   d

Setting data

■Descriptions, ranges, and data types

Operand	Description	Range	Data type	Data type (label)
(s)	Device number where the transfer source data is stored	—	16-bit signed binary	ANY16
(d)	Transfer destination device number	—	16-bit signed binary	ANY16
EN	Execution condition	—	Bit	BOOL
ENO	Execution result	—	Bit	BOOL

■Applicable devices

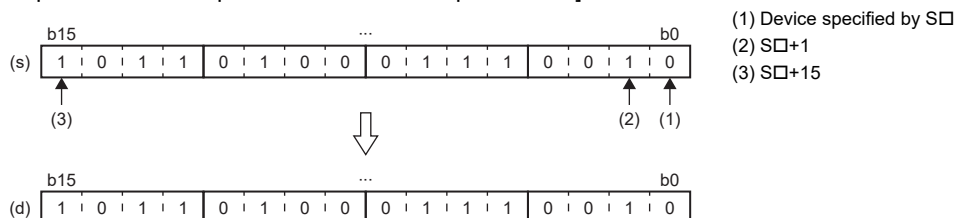| Operand	Bit	Word		Double word		Indirect specification	Constant			Others (BL□\S□)
	X, Y, M, L, SM, F, B, SB, S	T, ST, C, D, W, SD, SW, R	U□\G□	Z	LC	LZ		K, H	E	$	
(s)	○*1	—	—	—	—	—	—	—	—	—	○
(d)	○*2	○	○	○	—	—	○	—	—	—	—

*1 Only S can be used.
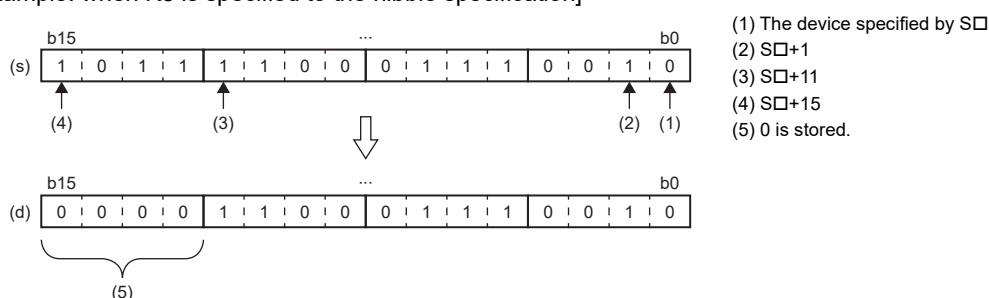*2 Other than S can be used.

Processing details

- These instructions batch-read (in units of 16-bit binary data) the status (active or inactive) of steps in the specified block. K1 to K4 can be specified to the nibble specification of the step relay (S).
- When a block is not specified, the status (active or inactive) of the following block is read.
  - Sequence program: Block 0
  - SFC program (within the action): Block where the instruction is executed (current block)
- The read data are stored in the device specified by (d). When the step is active, 1 is stored. When the step is inactive, 0 is stored.

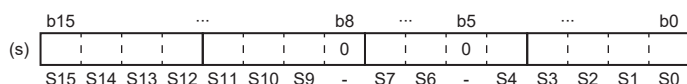[Example: when K4 is specified to the nibble specification]

(1) Device specified by S□
(2) S□+1
(3) S□+15

[Example: when K3 is specified to the nibble specification]

(1) The device specified by S□
(2) S□+1
(3) S□+11
(4) S□+15
(5) 0 is stored.

- When there is a missing step No., 0 is stored in the corresponding bit.

Ex.

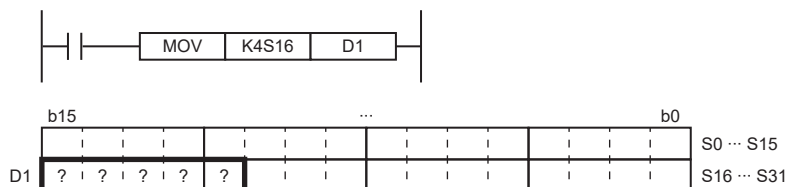When the step No.5 and No.8 are missing in the specified block (The status of each step is stored in other bits.)

- If no block is specified, when the read target range exceeds the maximum step No. in the block, undefined values will be stored.

Ex.

When the last step No. in the specified block is S26 and the status of steps (S16 to S31) are read to D1. (The status of each step is stored in other bits.)

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- If the read target range exceeds the number of steps in the specified block, 0 is stored in the bits exceeding the existing step No.
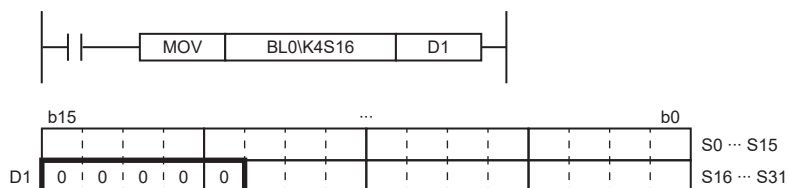
Ex.

When the last step No. in the specified block is S26 and the status of steps (S16 to S31) are read to D1. (The status of each step is stored in other bits.)

- If the block 0 does not exist, when the instruction is executed in the sequence program, undefined values are stored in all bits.
- In the case of "with block specification," if a non-existent block is specified, the bit data to be read will be 0.
- If a non-existent step is at the beginning of the data to be read, the bit data to be read will be 0.
- If readout is performed in the absence of the SFC program, the following operation will be performed depending on the presence/absence of the SFC program setting and block setting in the CPU parameters.

SFC program setting	Block specification	Instruction operation
Not use	None	The device value of the step relay will be transferred to (d).
	Present	The bit data to be read becomes "0".
Use	None	The bit data to be read becomes "0".
	Present	The bit data to be read becomes "0".

Operation error

Error code (SD0/SD8067)	Description
2820H	When a block No. is specified, the specified block No. is out of the range of 0 to 31.
	When a block No. is specified, the specified step No. is out of the range of 0 to 511.
	When the step relay No. where the specified step is assigned is out of the range of 0 to 4095.
	When a block No. is not specified, the specified step No. is out of the range of 0 to 4095.
2821H	When a step relay (s) is specified to (d).
3582H	The SFC control instruction is used in the interrupt routine program.

Point

Use a digit specification to specify a step. (Kn: K1 to K4)
- To specify a step in the current block of an SFC program, use KnS□.
- To specify a step in another block of an SFC program, use BL□\KnS□.
- To specify a step of a sequence program, use BL□\KnS□.

DMOV(P) [KnS□/BL□\KnS□]

FX5S **FX5UJ** **FX5U** **FX5UC**

These instructions batch-read (in units of 32-bit binary data) the status (active or inactive) of steps in the specified block, and store the read data in the specified device. (Kn: K1 to K8)

Ladder diagram	Structured text
▭ ▭ (s) (d)	ENO:=DMOV(EN,s,d); ENO:=DMOVP(EN,s,d);

FBD/LD

Setting data

■Descriptions, ranges, and data types

Operand	Description	Range	Data type	Data type (label)
(s)	Device number where the transfer source data is stored	—	32-bit signed binary	ANY32
(d)	Transfer destination device number	—	32-bit signed binary	ANY32
EN	Execution condition	—	Bit	BOOL
ENO	Execution result	—	Bit	BOOL

■Applicable devices

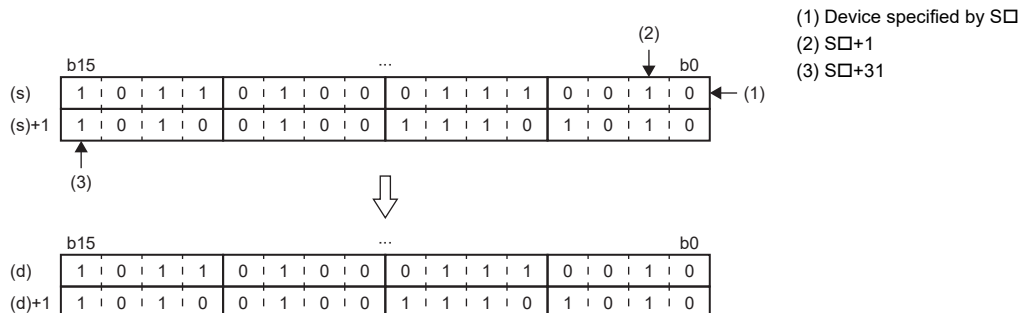| Operand	Bit	Word			Double word		Indirect	Constant			Others
	X, Y, M, L, SM, F, B, SB, S	T, ST, C, D, W, SD, SW, R	U□\G□	Z	LC	LZ	specification	K, H	E	$	(BL□\S□)
(s)	○*1	—	—	—	—	—	—	—	—	—	○
(d)	○*2	○	○	○	○	○	○	—	—	—	—

*1 Only S can be used.

*2 Other than S can be used.

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Processing details

- These instructions batch-read (in units of 32-bit binary data) the status (active or inactive) of steps in the specified block. K1 to K8 can be specified to the nibble specification of the step relay (S).
- When a block is not specified, the status (active or inactive) of the following block is read.
  - Sequence program: Block 0
  - SFC program (within the action): Block where the instruction is executed (current block)
- The read data are stored in the device specified by (d). When the step is active, 1 is stored. When the step is inactive, 0 is stored.

[Example: when K8 is specified to the nibble specification]

(1) Device specified by S□
(2) S□+1
(3) S□+31

[Example: when K3 is specified to the nibble specification]

(1) The device specified by S□
(2) S□+1
(3) S□+11
(4) S□+31
(5) 0 is stored.
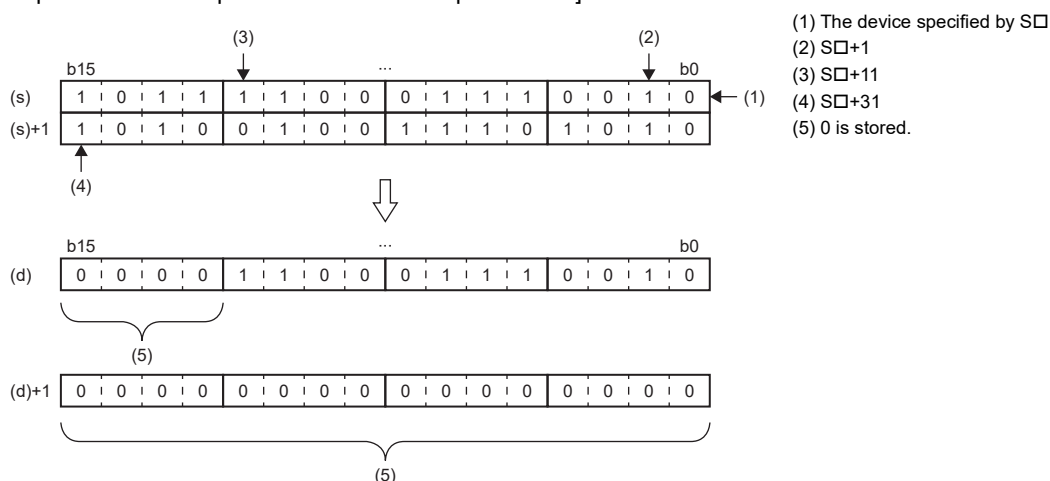
- When there is a missing step No., 0 is stored in the corresponding bit.
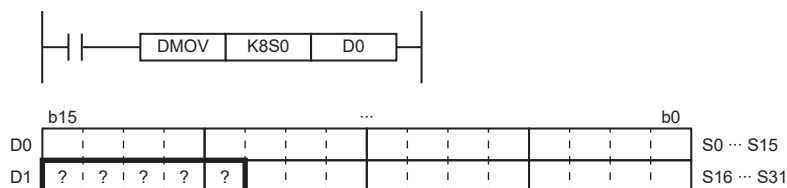
Ex.

When the step No.5, 8, 18, and 29 are missing in the specified block. (The status of each step is stored in other bits.)
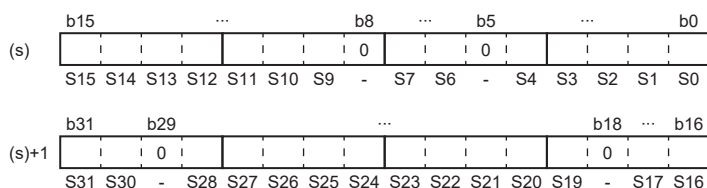
- If no block is specified, when the read target range exceeds the maximum step No. in the block, undefined values will be stored.

Ex.

When the last step No. in the specified block is S26 and the status of steps (S0 to S31) are read to D0 and D1. (The status of each step is stored in other bits.)

- If the read target range exceeds the number of steps in the specified block, 0 is stored in the bits exceeding the existing step No.
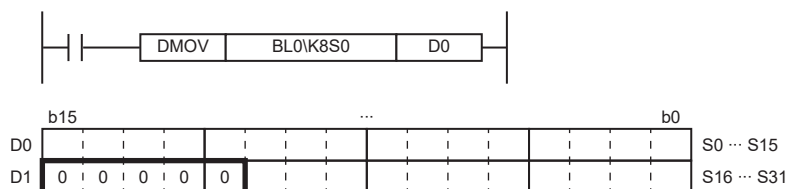
Ex.

When the last step No. in the specified block is S26 and the status of steps (S0 to S31) are read to D0 and D1. (The status of each step is stored in other bits.)

- If block 0 does not exist, when the instruction is executed in the sequence program, undefined values are stored in all bits.
- In the case of "with block specification," if a non-existent block is specified, the bit data to be read will be 0.
- If a non-existent step is at the beginning of the data to be read, the bit data to be read will be 0.
- If readout is performed in the absence of the SFC program, the following operation will be performed depending on the presence/absence of the SFC program setting and block setting in the CPU parameters.

SFC program setting	Block specification	Instruction operation
Not use	None	The device value of the step relay will be transferred to (d).
	Present	The bit data to be read becomes "0".
Use	None	The bit data to be read becomes "0".
	Present	The bit data to be read becomes "0".

Operation error

Error code (SD0/SD8067)	Description
2820H	When a block No. is specified, the specified block No. is out of the range of 0 to 31.
	When a block No. is specified, the specified step No. is out of the range of 0 to 511.
	When the step relay No. where the specified step is assigned is out of the range of 0 to 4095.
	When a block No. is not specified, the specified step No. is out of the range of 0 to 4095.
2821H	When a step relay (s) is specified to (d).
3582H	The SFC control instruction is used in the interrupt routine program.

Point

Use a digit specification to specify a step. (Kn: K1 to K8)

- To specify a step in the current block of an SFC program, use KnS□.
- To specify a step in another block of an SFC program, use BL□\KnS□.
- To specify a step of a sequence program, use BL□\KnS□.

BMOV(P) [KnS□/BL□\KnS□]

FX5S **FX5UJ** **FX5U** **FX5UC**

These instructions batch-read (in units of the specified number of words starting from the specified step) the status (active or inactive) of steps in the specified block. (Kn: K1 to K4)

Ladder diagram	Structured text
[:] (s) (d) (n)	ENO:=BMOV(EN,s,n,d); ENO:=BMOVP(EN,s,n,d);

FBD/LD

```
    [ : ]
 EN      ENO
 s        d
 n
```

Setting data

■Descriptions, ranges, and data types

Operand	Description	Range	Data type	Data type (label)
(s)	Start number of a device where the transfer target data is stored	—	16-bit signed binary	ANY16
(d)	Transfer destination device start number	—	16-bit signed binary	ANY16
(n)	Number of transfer data points	0 to 65535	16-bit unsigned binary	ANY16
EN	Execution condition	—	Bit	BOOL
ENO	Execution result	—	Bit	BOOL

■Applicable devices

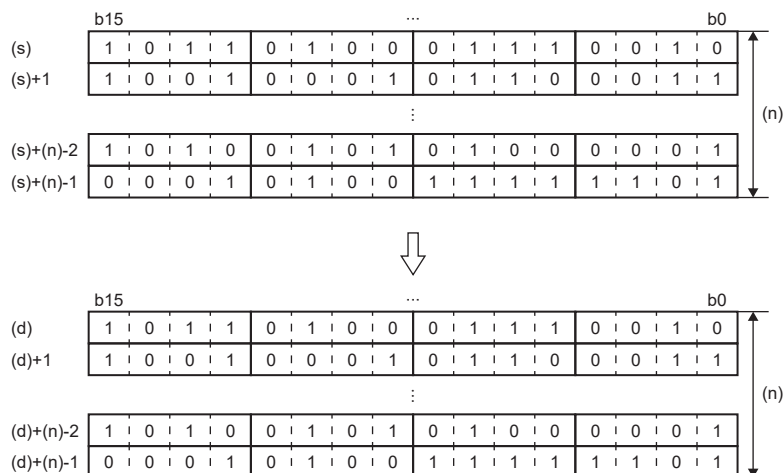| Operand	Bit	Word			Double word		Indirect specification	Constant			Others
	X, Y, M, L, SM, F, B, SB, S	T, ST, C, D, W, SD, SW, R	U□\G□	Z	LC	LZ		K, H	E	$	(BL□\ S□)
(s)	○*1	—	—	—	—	—	—	—	—	—	○
(d)	○*2	○	○	—	○	—	○	—	—	—	—
(n)	○*2	○	○	○	—	—	○	○	—	—	—

*1 Only S can be used.

*2 Other than S can be used.
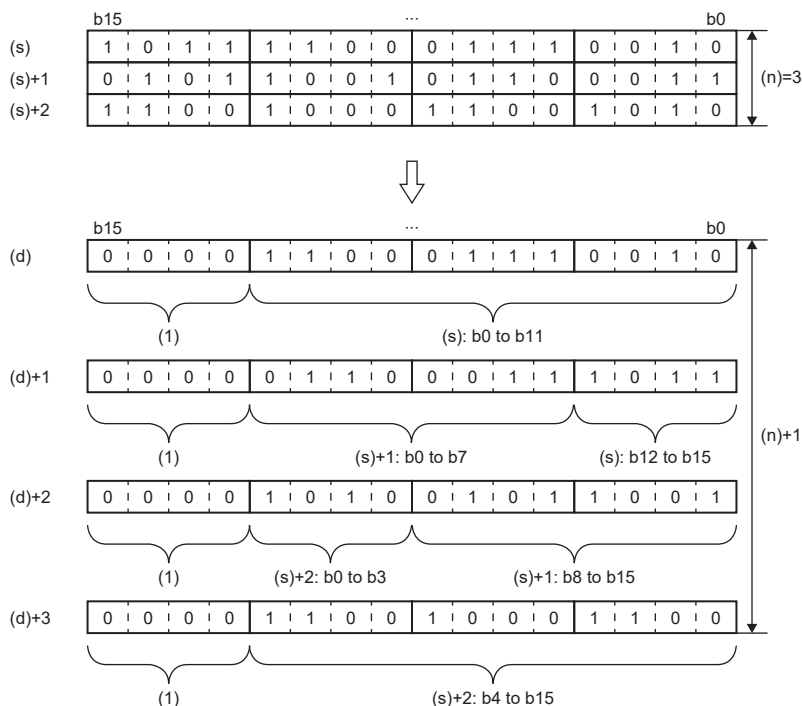
Processing details

- These instructions batch-read (in units of the specified number of words starting from the specified step) the status (active or inactive) of steps in the specified block. K1 to K4 can be specified to the nibble specification of the step relay (S).
- When a block is not specified, the status (active or inactive) of the following block is read.
  - Sequence program: Block 0
  - SFC program (within the action): Block where the instruction is executed (current block)
- The read data are stored in the device specified by (d).

[Example: when K4 is specified to the nibble specification]

	b15	...		b0	
(s)	1 0 1 1	0 1 0 0	0 1 1 1	0 0 1 0	
(s)+1	1 0 0 1	0 0 0 1	0 1 1 0	0 0 1 1	
:					(n)
(s)+(n)-2	1 0 1 0	0 1 0 1	0 1 0 0	0 0 0 1	
(s)+(n)-1	0 0 0 1	0 1 0 0	1 1 1 1	1 1 0 1	

⇩

	b15	...		b0	
(d)	1 0 1 1	0 1 0 0	0 1 1 1	0 0 1 0	
(d)+1	1 0 0 1	0 0 0 1	0 1 1 0	0 0 1 1	
:					(n)
(d)+(n)-2	1 0 1 0	0 1 0 1	0 1 0 0	0 0 0 1	
(d)+(n)-1	0 0 0 1	0 1 0 0	1 1 1 1	1 1 0 1	

[Example: when K3 (the numbers of transfers: 03) is specified to the nibble specification]

(1) 0 is stored.

	b15	...		b0	
(s)	1 0 1 1	1 1 0 0	0 1 1 1	0 0 1 0	
(s)+1	0 1 0 1	1 0 0 1	0 1 1 0	0 0 1 1	(n)=3
(s)+2	1 1 0 0	1 0 0 0	1 1 0 0	1 0 1 0	

⇩

	b15	...		b0
(d)	0 0 0 0	1 1 0 0	0 1 1 1	0 0 1 0

(1)   (s): b0 to b11

	b15	...		b0	
(d)+1	0 0 0 0	0 1 1 0	0 0 1 1	1 0 1 1	

(1)   (s)+1: b0 to b7   (s): b12 to b15   (n)+1

(d)+2	0 0 0 0	1 0 1 0	0 1 0 1	1 0 0 1

(1)   (s)+2: b0 to b3   (s)+1: b8 to b15

(d)+3	0 0 0 0	1 1 0 0	1 0 0 0	1 1 0 0

(1)   (s)+2: b4 to b15

• When there is a missing step No., 0 is stored in the corresponding bit.
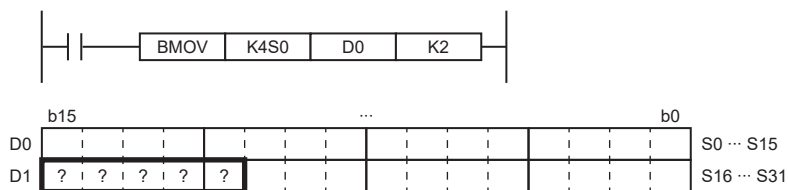
Ex.

When the step No.5 and No.8 are missing in the specified block (The status of each step is stored in other bits.)

• In the case of "without block specification," if the read target range is as shown below, undefined data will be stored.
  - When the maximum step No. in the block is exceeded
  - If block 0 does not exist, when the instruction is executed in the sequence program

Ex.

When the last step No. in the block is 26 and the status of the steps (two words from S0) is read to D0 and D1. (The status of each step is stored in other bits.)

• In the case of "with block specification," if the read target range is as shown below, undefined data will be stored.
  - When the maximum step No. in the block is exceeded
  - When a non-existent step is at the beginning of the read target range
• If a block is specified and block 0 does not exist, when the instruction that does not specify a block is executed in the sequence program, 0 is stored.

Ex.

When the last step No. in the block is 26 and the status of the steps (two words from S0) is read to D0 and D1. (The status of each step is stored in other bits.)
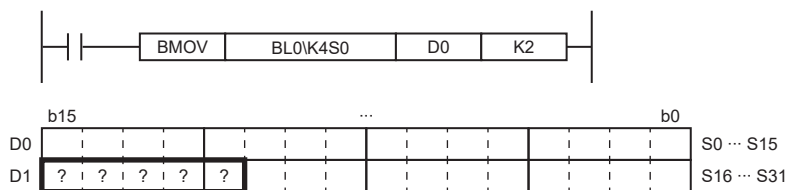
• If a block is specified, when the block that does not exist is specified, 0 is read and stored in all bits.
• If no block is specified, when the read target range exceeds the maximum step No. (S4095), the data from the first step No. to the maximum step No. will be read.
• When the read target range exceeds the maximum device No. (such as D7999), the data from the first device No. to the maximum device No. are transferred.
• When the first device is out of the range of the device No., an error occurs and data is not read.
• If readout is performed in the absence of the SFC program, the following operation will be performed depending on the presence/absence of the SFC program setting and block setting in the CPU parameters.

SFC program setting	Block specification	Instruction operation
Not use	None	The device value of the step relay will be transferred to (d).
	Present	The bit data to be read becomes "0".
Use	None	The bit data to be read becomes "0".
	Present	The bit data to be read becomes "0".

Operation error

Error code (SD0/SD8067)	Description
2820H	When a block No. is specified, the specified block No. is out of the range of 0 to 31.
	When a block No. is specified, the specified step No. is out of the range of 0 to 511.
	When the step relay No. where the specified step is assigned is out of the range of 0 to 4095.
	When a block No. is not specified, the specified step No. is out of the range of 0 to 4095.
	When the first device of (d) is out of the range of the device No.
2821H	When a step relay (s) is specified to (d) and (n)
3405H	The number of nibbles of the nibble specification of bit device (s) and (d) is different.
3582H	The SFC control instruction is used in the interrupt routine program.

Point

Use a digit specification to specify a step. (Kn: K1 to K4)

- To specify a step in the current block of an SFC program, use KnS□.
- To specify a step in another block of an SFC program, use BL□\KnS□.
- To specify a step of a sequence program, use BL□\KnS□.