
07-1 Basic instruction

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Transfer comparison instruction

MOV/16-bit transmission

MOV(P)

Transfer the BIN 16-bit data of the device specified in (S) to the device specified in (D).

-[MOV (S) (D)]

Content, range and data type

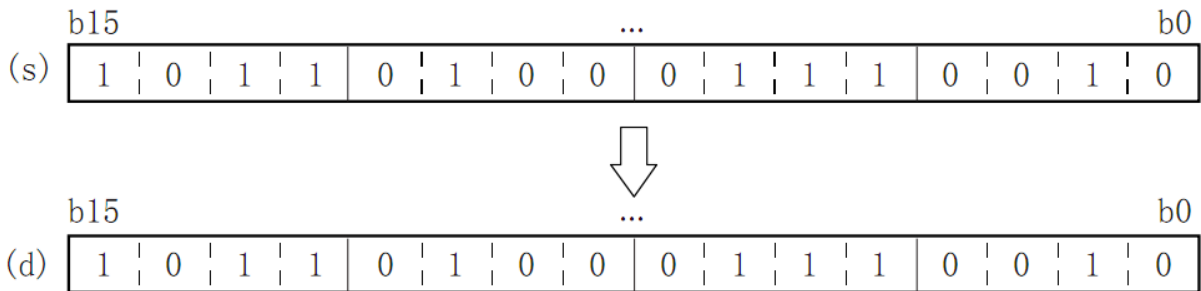
Parameter	Content	Range	Data type	Data type (label)
(S)	Transmit source data or the device number stored data	-32768 to 32767	Signed BIN16	ANY16_S
(D)	Transmit destination device number	-	Signed BIN16	ANY16_S

Device used

Instruction	Parameter	Devices											Offset modification	Pulse extension
		KnX	KnY	KnM	KnS	T	C	D	R	SD	K	H		
MOV	Parameter 1	●	●	●	●	●	●	●	●	●	●	●	●	●
	Parameter 2		●	●	●	●	●	●	●	●			●	●

Features

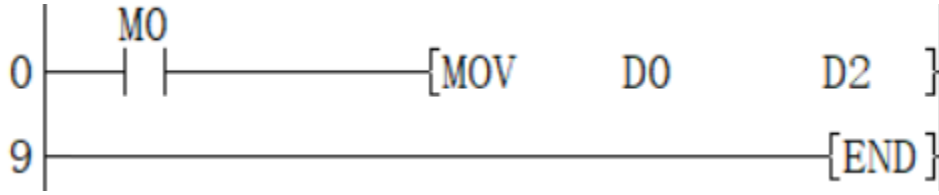
- Transfer the BIN 16-bit data specified in (S) to the device specified in (D).



Error code

Error code	Content
4085H	The output result of (S) in read application instruction exceeds the device range
4086H	The output result of (D) in write application instruction exceeds the device range

Example



When M0 is set, the value of D0 is transferred to the value of D2: (D0)→(D2).

DMOV/32-bit transmission

DMOV(P)

Transfer the BIN 32-bit data of the device specified in (S) to the device specified in (D).

-[DMOV (S) (D)]

Content, range and data type

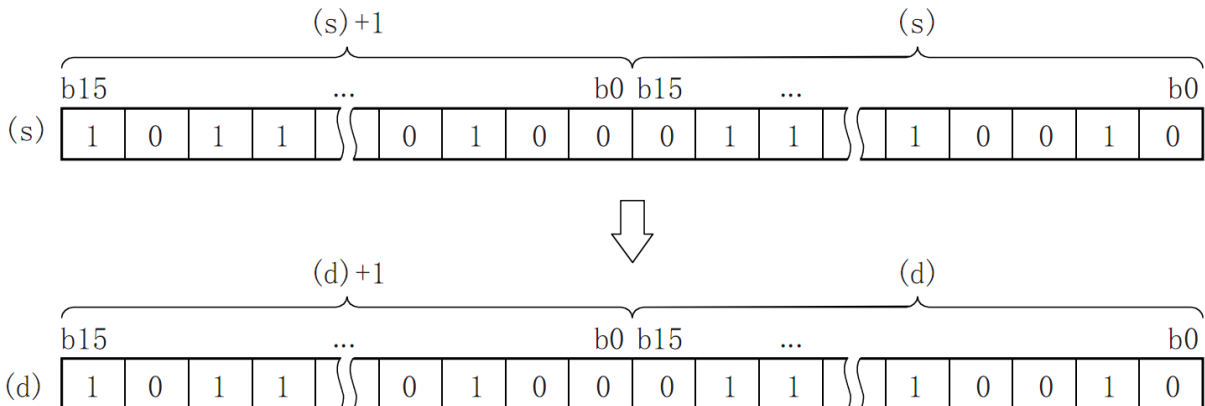
Parameter	Content	Range	Data type	Data type (label)
(S)	Transmit source data or the device number stored data	-2147483648 to 2147483647	Signed BIN32	ANY32_S
(D)	Transmit destination device number	-	Signed BIN32	ANY32_S

Device used

Instruction	Parameter	Devices													Offset Pulse modification dimension	
		KnX	KnY	KnM	KnS	T	C	D	R	SD	LC	HSC	K	H	[D]	XXP
DMOV	Parameter 1	●	●	●	●	●	●	●	●	●			●	●	●	●
	Parameter 2		●	●	●	●	●	●	●	●	●				●	●

Features

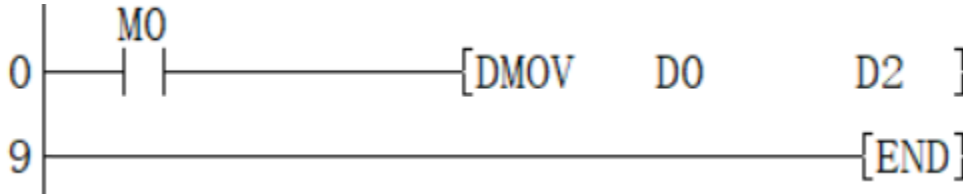
Transfer the BIN 16-bit data specified in (S) to the device specified in (D).



Error code

Error code	Content
4085H	The output result of (S) in read application instruction exceeds the device range
4086H	The output result of (D) in write application instruction exceeds the device range

Example



When M0 is set, the value of (D1, D0) is transferred to the value of (D3, D2): (D1, D0) → (D3, D2).

BMOV/Batch transmission

BMOV(P)

The (N) point BIN 16-bit data starting from the device specified in (S) is sequentially transmitted to the device specified in (D).

-[BMOV (S) (D) (N)]

Content, range and data type

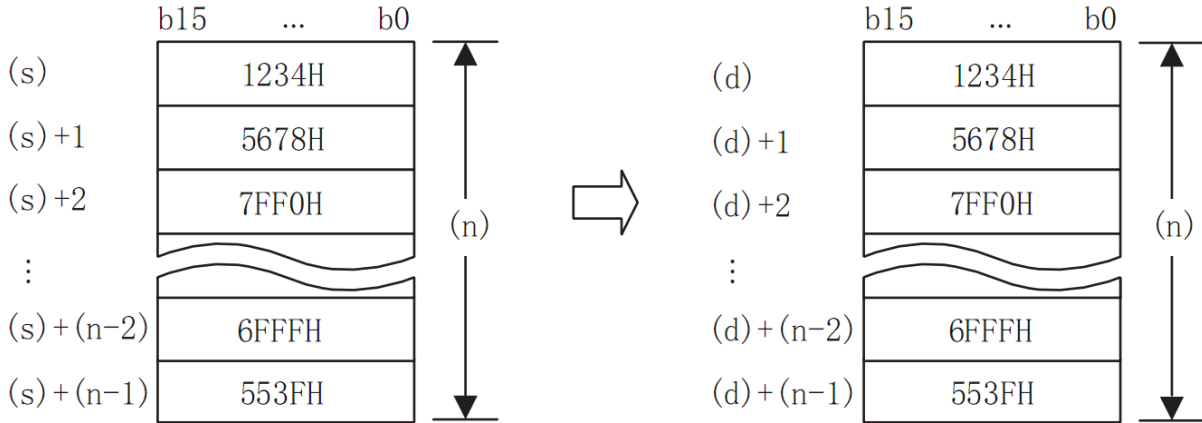
Parameter	Content	Range	Data type	Data type (label)
(S)	The start device that stores the transmission data	-	Signed BIN16	ANY16_S
(D)	The start device that transmit target	-	Signed BIN16	ANY16_S
(N)	Number of transmission	1 ≤ N ≤ 512	Signed BIN16	ANY16_S

Device used

Instruction	Parameter	Devices										Offset modification	Pulse extension	
		KnX	KnY	KnM	KnS	T	C	D	R	SD	K			H
BMOV	Parameter 1	●	●	●	●	●	●	●	●	●			●	●
	Parameter 2		●	●	●	●	●	●	●	●			●	●
	Parameter 3	●	●	●	●	●	●	●	●	●	●	●	●	●

Features

Batch transfer the BIN 16-bit data of point (N) starting from the device specified in (S) to the device specified in (D).



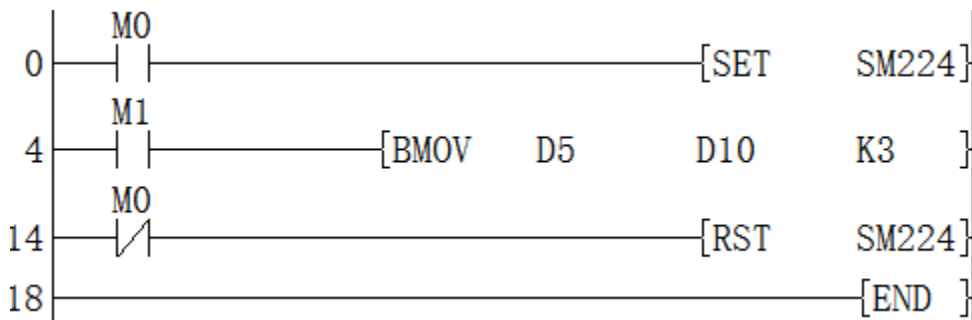
When the device number exceeds the range, it will be transferred within the allowable range.

By controlling the direction reversal flag (SM224) of the BMOV instruction, the BIN 16-bit data at point (N) starting from the device specified in (D) can be batch transferred to the device specified in (S).

Error code

Error code	Content
4084H	In application instruction (N) input the data exceeds the specified range
4085H	The output results of (S) and (N) in read application instruction exceed the device range
4086H	The output result of (D) in write application instruction exceeds the device range

Example



When M0 is set, set M1, then (D5)→(D10); (D6)→(D11); (D7)→(D12);

When M0 is reset, set M1, then (D10)→(D5); (D11)→(D6); (D12)→(D7).

FMOV/16-bit multicast

FMOV(P)

Transfer the BIN 16-bit data of the device specified in (S1) to the device specified in (D) at (N) points (that is, transfer the same data to multiple addresses).

-[FMOV (S) (D) (N)]

Content, range and data type

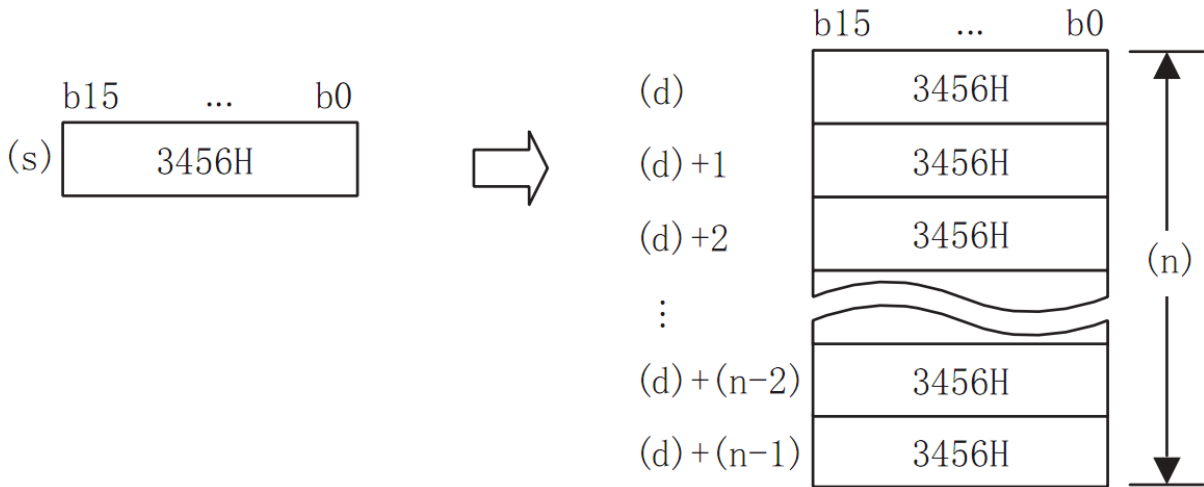
Parameter	Content	Range	Data type	Data type (label)
(S)	The start device that stores the transmission data	-32768 to 32767	Signed BIN16	ANY16_S
(D)	The start device that transmit target	-	Signed BIN16	ANY16_S
(N)	Number of transmission	[K1 ≤ N ≤ 512]	Signed BIN16	ANY16_S

Device used

Instruction	Parameter	Devices										Offset modification [D]	Pulse extension XXP	
		KnX	KnY	KnM	KnS	T	C	D	R	SD	K			H
FMOV	Parameter 1	●	●	●	●	●	●	●	●	●	●	●	●	●
	Parameter 2		●	●	●	●	●	●	●	●			●	●
	Parameter 3	●	●	●	●	●	●	●	●	●	●	●	●	●

Features

The same data as the BIN 16-bit data of the device specified in (S) is transferred to the device specified in (D) at (N) points.



When the number specified in (N) exceeds the device number range, transfer is performed within the allowable range.

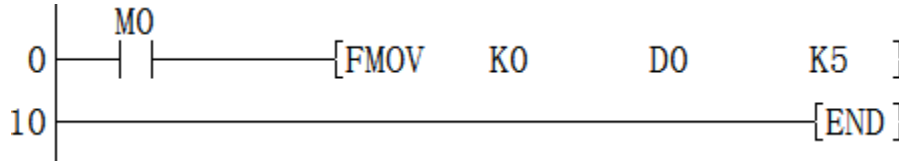
When a constant (K) is specified for the transmission source (S), it will be automatically converted to BIN.

Error code

Error code	Content
4084H	(S) and(N) input the data In application instruction exceed the specified range

4085H The output results of (S) and (N) in read application instruction exceed the device range
 4086H The output result of (D) in write application instruction exceeds the device range

Example



When M0 is set, the value of D0 to D4 is set to 0.

DFMOV/ 32-bit multicast

DFMOV(P)

Transfer the BIN 32-bit data of the device specified in (S1) to the device specified in (D) at (N) points (that is, transfer the same data to multiple addresses).

-[FMOV (S) (D) (N)]

Content, range and data type

Parameter	Content	Range	Data type	Data type (label)
(S)	Transfer data or start device storing transfer data	-2147483648 to 2147483647	Signed BIN32	ANY32_S
(D)	Start device of transfer destination	-	Signed BIN32	ANY32_S
(N)	Number of transfers	[1 ≤ N ≤ 512]	Signed BIN32	ANY32_S

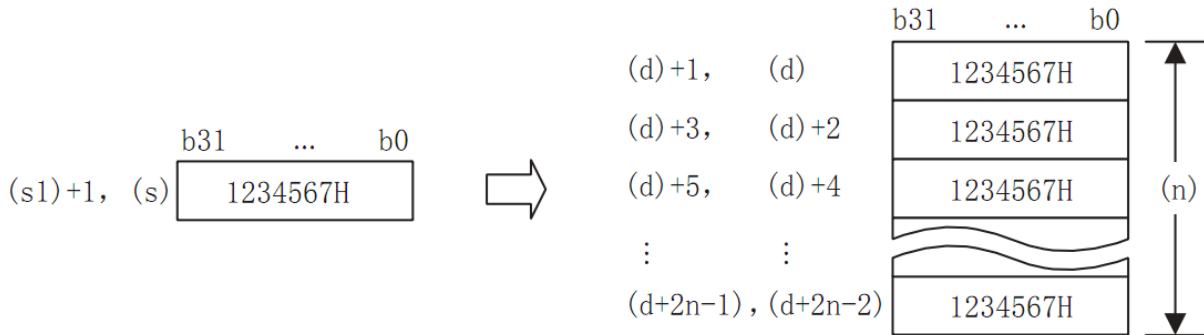
Device used

Instruction	Parameter	Devices	Offset modification	Pulse width dimension
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	KnX	KnY	KnM	KnS	T	C	D	R	SD	LC	HSC	K	H	[D]	XXP
Parameter 1	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
DFMOV Parameter 2		●	●	●	●	●	●	●	●					●	●
Parameter 3	●	●	●	●	●	●	●	●	●			●	●	●	●

Features

The same data as the BIN 32-bit data of the device specified in (S) is transferred to the device specified in (D) at (N) points.



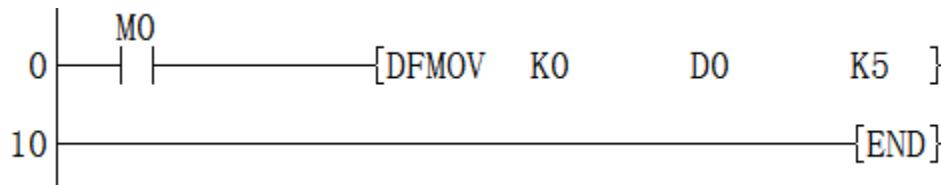
When the number specified in (N) exceeds the device number range, transfer is performed within the allowable range.

When a constant (K) is specified for the transmission source (S), it will be automatically converted to BIN.

Error code

Error code	Content
4084H	(S) and (N) input the data In application instruction exceed the specified range
4085H	The output results of (S) and (N) in read application instruction exceed the device range
4086H	The output result of (D) in write application instruction exceeds the device range

Example



When M0 is set, the value of (D1, D0), (D3, D2), (D5, D4), (D7, D6), (D9, D8) is set to 0.

SMOV/Bit shift

SMOV(P)

A instruction for distributing and synthesizing data in units of digits (4 bits).

-[SMOV (S) (N1) (N2) (D) (N3)]

Content, range and data type

Parameter	Content	Range	Data type	Data type (label)
(S)	The word device number that stores the data whose bit is to be moved		Signed BIN16	ANY16_S
(N1)	Transfer destination device number	1 to 4	Signed BIN16	ANY16_S
(N2)	The number of digits to move	1 to 4	Signed BIN16	ANY16_S
(D)	The word device number that stores data for bit shifting		Signed BIN16	ANY16_S
(N3)	The starting position of the moving target	1 to 4	Signed BIN16	ANY16_S

Device used

Instruction	Parameter	Devices											Offset modification	Pulse extension
		KnX	KnY	KnM	KnS	T	C	D	R	SD	K	H	[D]	XXP
SMOV	Parameter 1	●	●	●	●	●	●	●	●	●			●	●
	Parameter 2	●	●	●	●	●	●	●	●	●	●	●	●	●
	Parameter 3	●	●	●	●	●	●	●	●	●	●	●	●	●
	Parameter 4		●	●	●	●	●	●	●	●			●	●
	Parameter 5	●	●	●	●	●	●	●	●	●	●	●	●	●

Features

The data is distributed/combined in units of digits (4 bits). The contents of the transmission source (S) and the transmission destination (D) are converted into 4-digit BCD (0000 to 9999), and the (N1) bits are transferred to the lower (N2) bits and the (N3) bits of the transmission destination (D) (combined). After reaching the starting position, it is converted to BIN and stored in the transfer destination (D).

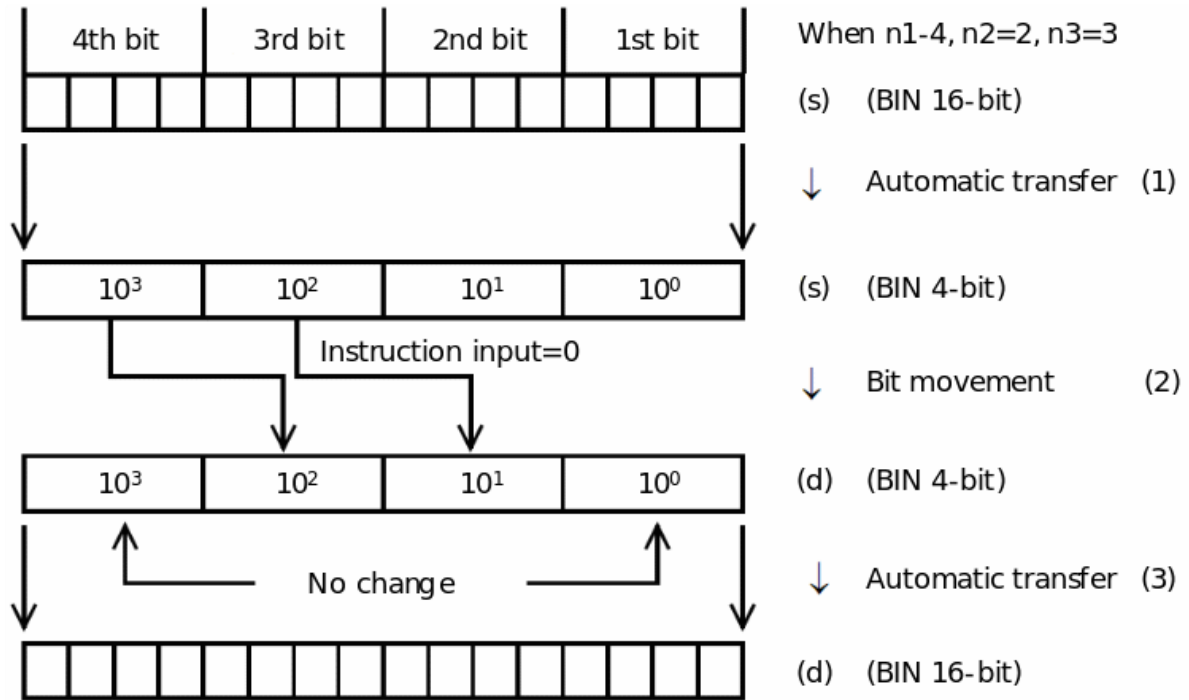
When the instruction input is OFF, the transfer destination (D) does not change.

When the instruction input is ON, the data of the transmission source (S) and the number of digits other than the transmission specification of the transmission destination (D) do not change.

Perform BIN→BCD conversion on (S).

Transfer (synthesize) the (N1)th bit to the lower (N2), (D), (N3)th bit to the (N2)th bit counted from the previous. (D), the first and fourth digits start from (S), and the transmission will not be affected.

Convert the synthesized data (BCD) into BIN and store it in (D).



Extended function

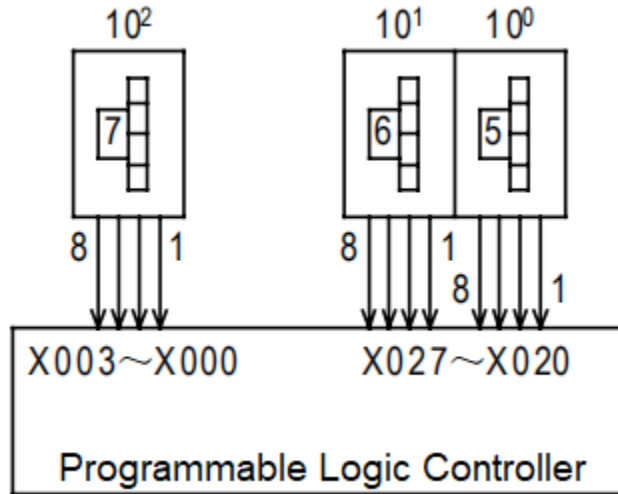
If the SMOV instruction is executed after SM168 is turned ON, the BIN→BCD conversion will not be performed. The bit shift is performed in 4-bit units.

Error code

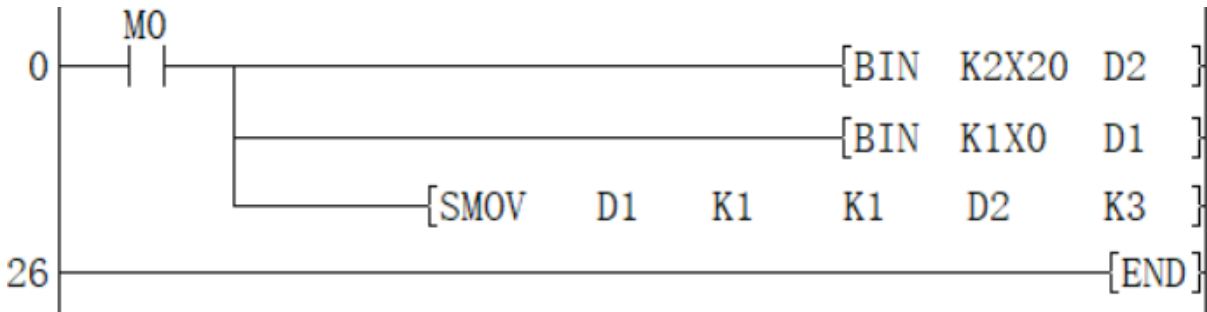
Error code	Content
4084H	(N1), (N2) and (N3) input data that exceed the specified range in the application instruction or does not satisfy the relationship of $N2 \leq N1$ and $N2 \leq N3$.
4085H	The output result of (S), (N1) (N2), (D) and (N3) in the read application instruction exceeds the device range
4086H	The output result of (D) in write application instructions exceeds the device range

Example

After synthesizing the data of the 3-digit digital switch, it is stored in D2 in binary.



Combine data of 3 digital switches connected to non-continuous input terminals.



When M0 is set,

(X020 to X027) BCD 2 digits → D 2 (binary);

(X000 to X003) BCD 1 digit → D 1 (binary);

Store the 1 digit of D1 into the 3 digit of D2, and synthesize a 3-digit value.

CML/16-bit invert transmission

CML(P)

After the BIN 16-bit data specified in (S) is inverted bit by bit, the result is transferred to the device specified in (D).

-[CML (S) (D)]

Content, range and data type

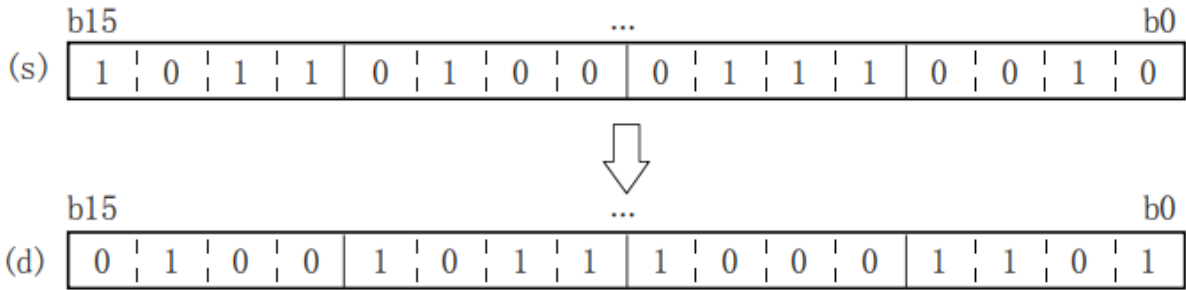
Parameter	Content	Range	Data type	Data type (label)
(S)	Inverted data or the device number that stores data	-32768 to 32767	Signed BIN16	ANY16_S
(D)	The device number that stores the inversion result	-	Signed BIN16	ANY16_S

Device used

Instruction	Parameter	Devices										Offset modification	Pulse extension	
		KnX	KnY	KnM	KnS	T	C	D	R	SD	K	H	[D]	XXP
CML	Parameter 1	●	●	●	●	●	●	●	●	●	●	●	●	●
	Parameter 2		●	●	●	●	●	●	●	●			●	●

Features

After inverting the BIN 16-bit data specified in (S) bit by bit, the result is transferred to the device specified in (D).



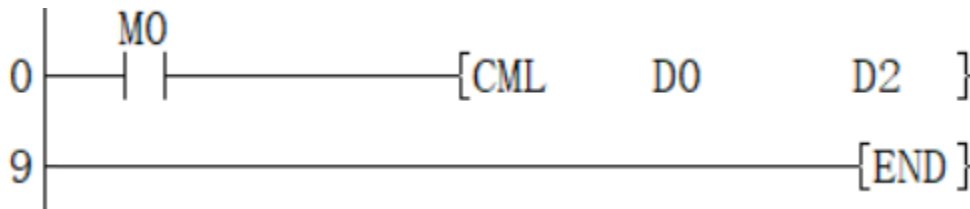
When the number of digits of the device with the specified digit is 4 points, other digits are not affected.

Error code

Error code	Content
4085H	The output result of (S) in read application instruction exceeds the device range
4086H	The output result of (D) in write application instruction exceeds the device range

Example

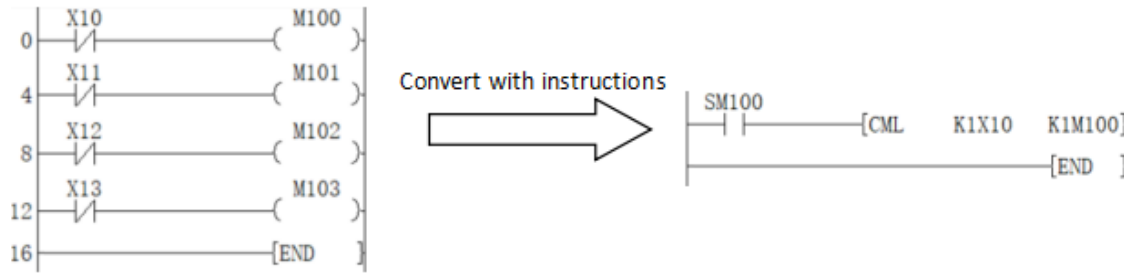
Example 1:



When M0 is set, the value of D0 is inverted and transferred to the value of D2.

Example 2:

invert input acquisition:



DCML/32-bit invert transmission

DCML(P)

After the BIN 32-bit data specified in (s) is inverted bit by bit, the result is transferred to the device specified in (d).

-[CML (s) (d)]

Content, range and data type

Parameter	Content	Range	Data type	Data type (label)
(s)	Inverted data or the device number that stores data	-2147483648 to 2147483647	Signed BIN32	ANY32_S
(d)	The device number that stores the inversion result	-	Signed BIN32	ANY32_S

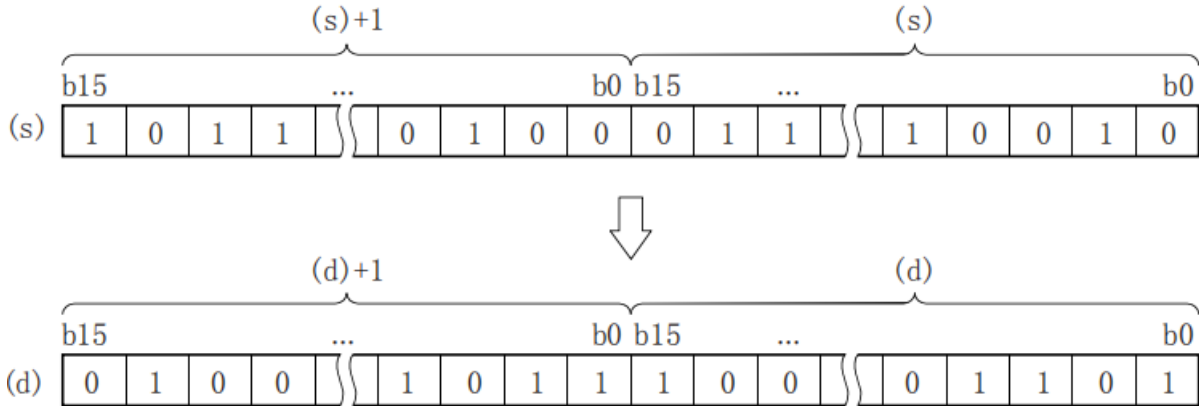
Device used

Instruction Parameters

Instruction	Parameters														Offset modification [D]	Pulse extension XXP	
	KnX	KnY	KnM	KnS	T	C	D	R	SD	LC	HSC	K	H	E			
DCML	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Parameter 1	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Parameter 2	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●

Features

After inverting the BIN 32-bit data specified in (s) bit by bit, the result is transferred to the device specified in (d).



When the number of digits of the device with the specified digit is 4 points, other digits are not affected.

Error code

Error code	Content
4085H	The output result of (s) in read application instruction exceeds the device range
4086H	The output result of (d) in write application instruction exceeds the device range

Example



When M0 is set, the value of (D1, D0) is reversed and transferred to the value of (D3, D2).

CMP/16-bit data comparison output

CMP(P)

Compare the BIN 16-bit data of the device specified in (s1) and (s2).

-[CML (S1) (S2) (D)]

Content, range and data type

Parameter	Content	Range	Data type	Data type (label)
(S1)	Comparison value data or the device storing the comparison value data	-32768 to +32767	Signed BIN16	ANY16_S
(S2)	Comparison source data or the device storing the comparison source data	-32768 to 32767	Signed BIN16	ANY16_S
(D)	Start bit device for output comparison result		Bit	ANYBIT_ARRAY

Device used

Instruction parameter	Devices	OffsetPulse modification	Pulse duration
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	Y	M	S	SM	D.b	KnX	KnY	KnM	KnS	T	C	D	R	SD	K	H	[D]	XXP
Parameter 1						●	●	●	●	●	●	●	●	●	●	●	●	●
CMP Parameter 2							●	●	●	●	●	●	●	●			●	●
Parameter 3	●	●	●	●	●												●	

Features

Compare the BIN 16-bit data of the device specified in (S1) with the BIN 16-bit data of the device specified in (S2). According to the result (less than, consistent, greater than), (D), (D)+1, (D) One of)+2 will turn ON.

(S1) and (S2) are handled as BIN values within the above setting data range.

Use algebraic methods for size comparison.

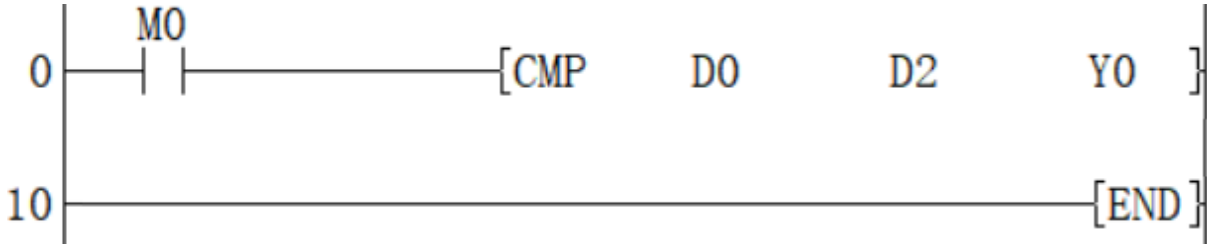
(1): Even if the instruction input is OFF and the CMP instruction is not executed, (D) to (D)+2 will keep the state before the instruction input changed from ON to OFF.

#Note: Occupy the device specified in 3 points (D) at the beginning, please be careful not to overlap with the device used for other control.

Error code

Error code	Content
4085H	The output results of (S1) and (S2) in read application instruction exceed the device range
4086H	The output result of (D) in write application instruction exceeds the device range

Example



When M0 is set, compare the values of D0 and D2:

If (D0) > (D2) then Y0 is ON.

If (D0) = (D2) then Y1 is ON. If (D0) < (D2) then Y2 is ON.

DCMP/32-bit data comparison output

DCMP(P)

Compare the BIN 32-bit data of the device specified in (S1) and (S2).

-[DCML (S1) (S2) (D)]

Content, range and data type

Parameter	Content	Range	Data type	Data type (label)
(S1)	Comparison value data or the device storing the comparison value data	-2147483648 to 2147483647	Signed BIN32	ANY32_S
(S2)	Comparison source data or the device storing the comparison source data	-2147483648 to 2147483647	Signed BIN32	ANY32_S
(D)	Start bit device for output comparison result		Bit	ANYBIT_ARRAY

Device used

Instruction	Parameter	Devices																Offset		Pulse		
		Y	M	S	SM	D.b	KnX	KnY	KnM	KnS	T	C	D	R	SD	LC	HSC	K	H	[D]	XXP	
DCMP	Parameter 1						●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
	Parameter 2							●	●	●	●	●	●	●	●	●	●				●	●
	Parameter 3	●	●	●	●	●															●	

Features

- Compare the BIN 16-bit data of the device specified in (S1) with the BIN 16-bit data of the device specified in (S2). According to the result (less than, consistent, greater than), (D), (D)+1, (D) One of)+2 will turn ON.
- (S1) and (S2) are handled as BIN values within the above setting data range.
- Use algebraic methods for size comparison.

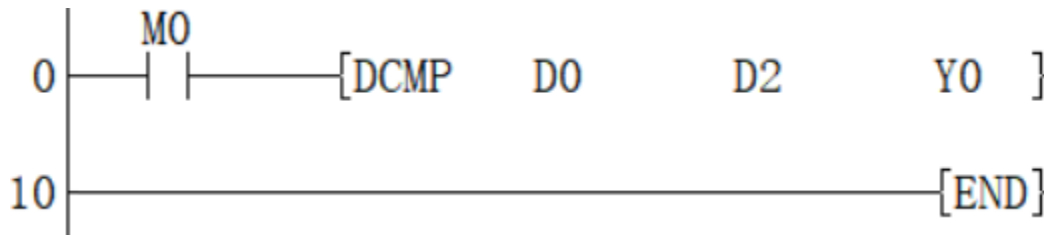
(1): Even if the instruction input is OFF, the DCMPL instruction is not executed, (D) to (D)+2 will keep the state before the instruction input changed from ON to OFF.

#Note: Occupy the device specified in 3 points (D) at the beginning. Please be careful not to overlap with other control devices.

Error code

Error code	Content
4085H	The output results of (S1) and (S2) in read application instruction exceed the device range
4086H	The output result of (D) in write application instruction exceeds the device range

Example



When M0 is set, compare the values of (D1, D0) and (D3, D2):

If (D1, D0) > (D3, D2) then Y0 is ON.

If (D1, D0) = (D3, D2) then Y1 is ON.

If (D1, D0) < (D3, D2) then Y2 is ON.

XCH/16-bit data exchange

XCH(P)

Exchange the BIN 16-bit data of (D1) and (D2).

-[XCH (D1) (D2)]

Content, range and data type

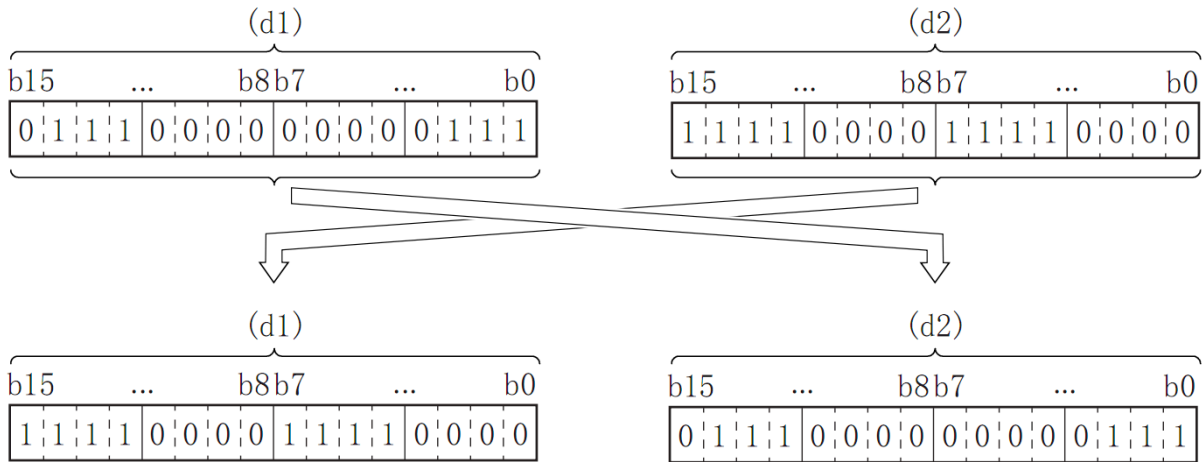
Parameter	Content	Range	Data type	Data type (label)
(D1)	The start device that stores the exchange data	-32768 to 32767	Signed BIN16	ANY16_S
(D2)	The start device that stores the exchange data	-32768 to 32767	Signed BIN16	ANY16_S

Device used

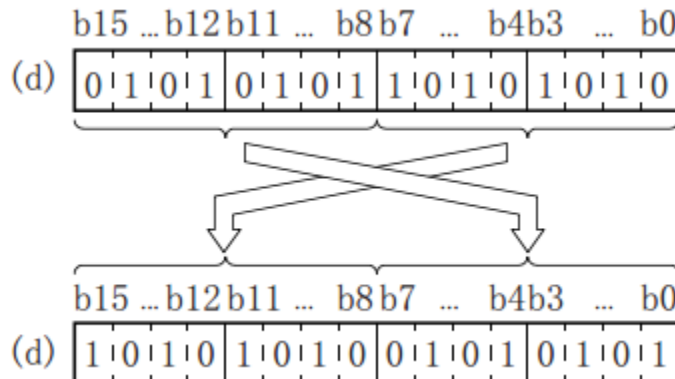
Instruction	Parameter	Devices							Offset	Pulse	
		KnY	KnM	KnS	T	C	D	R	SD	[D]	extension
XCH	Parameter 1	●	●	●	●	●	●	●	●	●	●
	Parameter 2	●	●	●	●	●	●	●	●	●	●

Features

- Exchange the BIN 16-bit data of (D1) and (D2).



- When executing instructions with SM160 ON, if the device numbers of (D1) and (D2) are the same. Exchange the upper 8 bits (byte) and lower 8 bits (byte) of the word device.



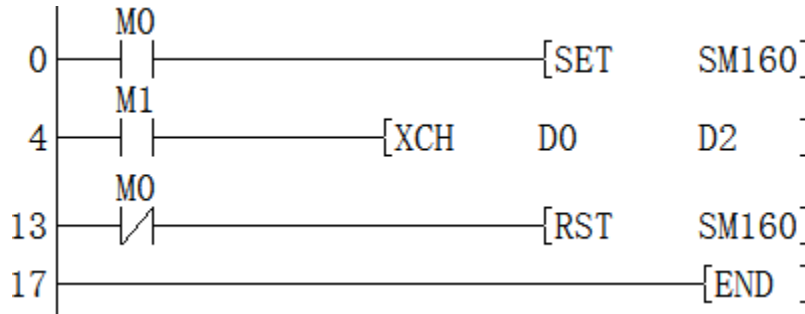
#Note: If continuous execution instructions are used, conversion will be performed every operation cycle.

Error code

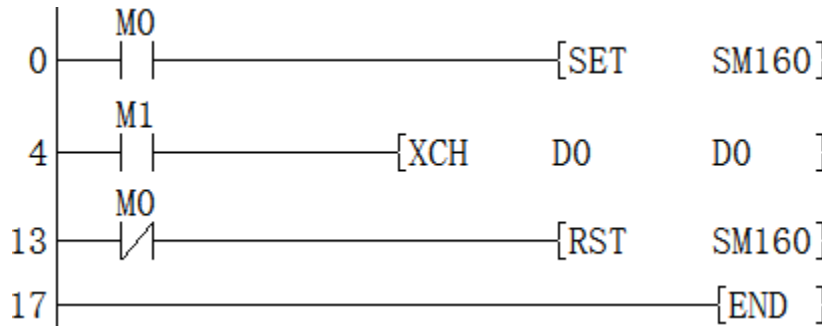
Error code	Content
4084H	In exchange mode, the devices in (D1) and (D2) are different
4085H	The output results of (D1) and (D2) in the read application instruction exceed the device range
4086H	The output results of (D1) and (D2) in the writing application instruction exceed the device range

Example

When M0 is reset, set M1: the value of D0 and the value of D2 are exchanged.



When M0 is set, M1 is set: the upper 8 bits (bytes) and lower 8 bits (bytes) of D0 are exchanged with each other.



DXCH/32-bit data exchange

DXCH(P)

Exchange (D1) and (D2) BIN 32-bit data.

-[DXCH (D1) (D2)]

Content, range and data type

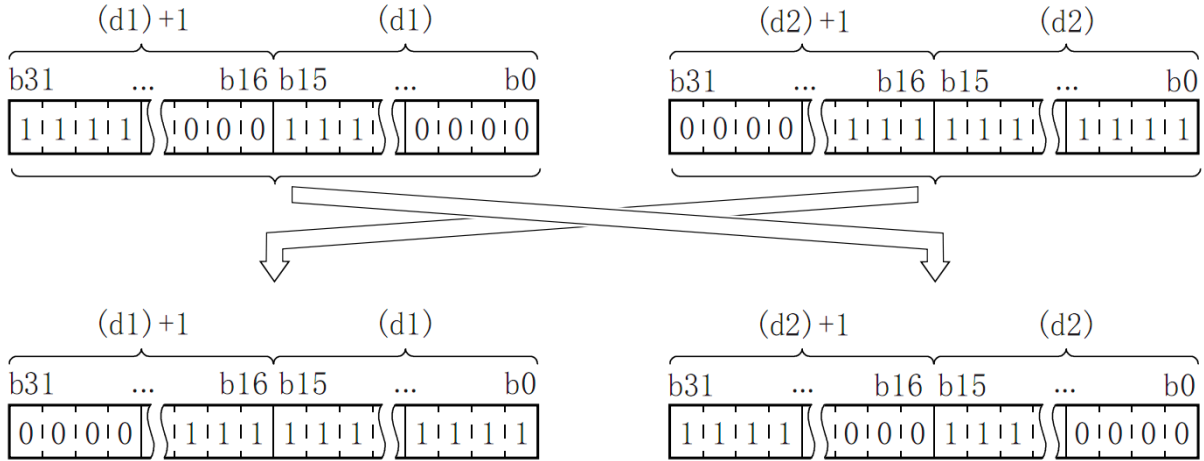
Parameter	Content	Range	Data type	Data type (label)
(D1)	The start device that stores the exchange data	-2147483647 to 2147483647	Signed BIN32	ANY32_S
(D2)	The start device that stores the exchange data	-2147483647 to 2147483647	Signed BIN32	ANY32_S

Device used

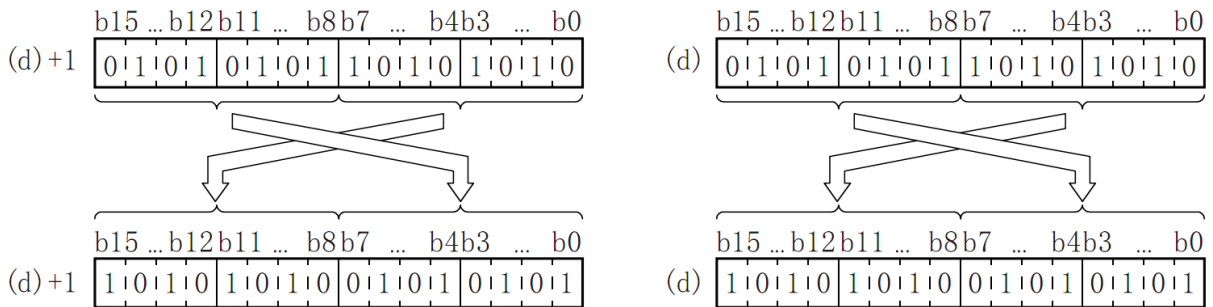
Instruction	Parameter	Devices										Offset modification	Pulse extension
		KnY	KnM	KnS	T	C	D	R	SD	LC	HSC	[D]	XXP
DXCH	Parameter 1	●	●	●	●	●	●	●	●	●	●	●	●
	Parameter 2	●	●	●	●	●	●	●	●	●	●	●	●

Features

- Exchange the BIN 32-bit data of (D1), (D1)+1 and (D2), (D2)+1.



- When executing instructions with SM160 ON, if the device numbers of (D1) and (D2) are the same. Exchange the upper 8 bits (byte) and lower 8 bits (byte) of the word device (D1) and (D1+1).



#Note: If continuous execution instructions are used, conversion will be performed every operation cycle.

Error code

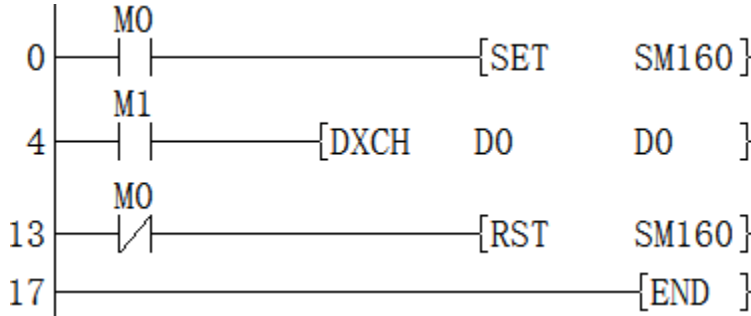
Error code	Content
4084H	In exchange mode, the devices in (D1) and (D2) are different
4085H	The output results of (D1) and (D2) in the read application instruction exceed the device range

4086H

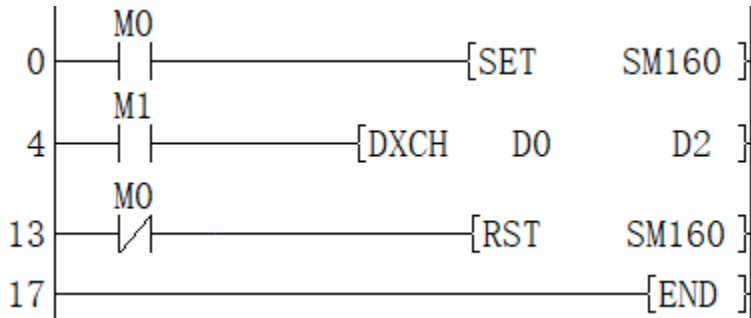
The output results of (D1) and (D2) in the writing application instruction exceed the device range

Example :

When M0 is set, M1 is set: the high 8 bits (byte) and low 8 bits (byte) of the D0 Devices are exchanged, and the high 8 bits (byte) and low 8 bits (byte) of the D1 Devices) Exchange each other.



When M0 is reset, set M1: the value of (D1, D0) and the value of (D3, D2) are exchanged.



ZCP/16-bit data interval comparison

ZCP(P)

Compare the BIN 16-bit data of the device specified in (S1) and the value (bandwidth) of the BIN 16-bit data of the device specified in (S2) with the BIN 16-bit data of the device specified in the comparison source (S3), Output the result (bottom, area, top) to the device specified in (D) and later.

-[ZCP (S1) (S2) (S3) (D)]

Content, range and data type

Parameter	Content	Range	Data type	Data type (label)
(S1)	The comparison value data of low limit or the device that stores the comparison value data	-32768 to 32767	Signed BIN16	ANY16_S
(S2)	The comparison value data of high limit or the device that stores the comparison value data	-32768 to 32767	Signed BIN16	ANY16_S
(S3)	Comparison source data or the device that stores the comparison source data	-32768 to 32767	Signed BIN16	ANY16_S
(D)	The start bit device of output comparison result		Bit	ANYBIT_ARRAY

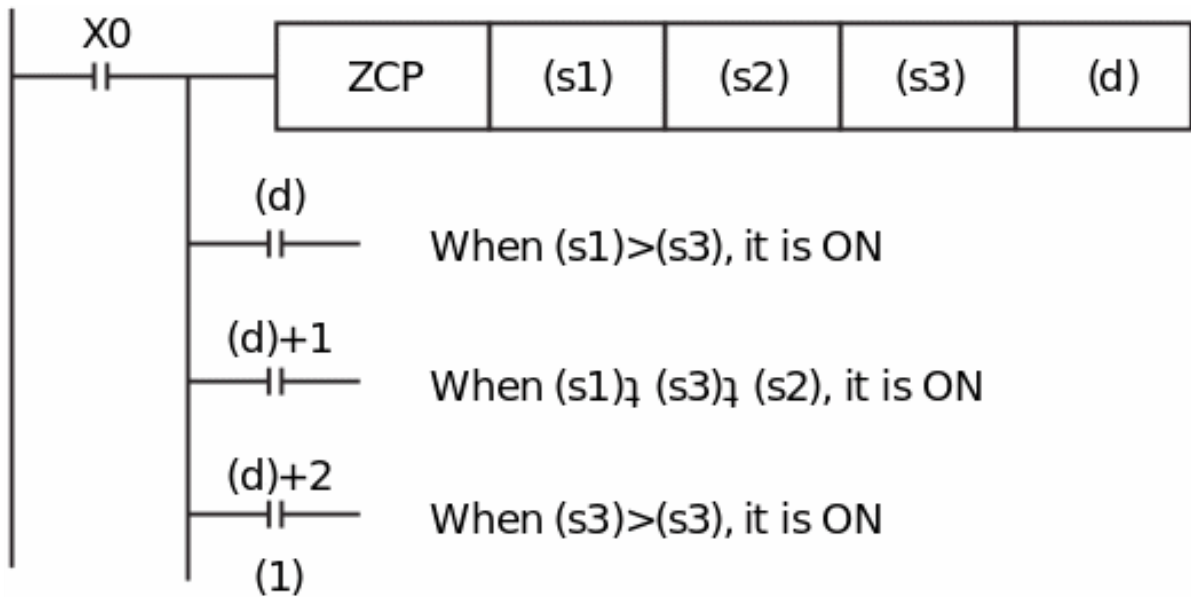
Device used

Instruction	Devices																Offset modification		
	Y	M	S	SM	D.b	KnX	KnY	KnM	KnS	T	C	D	R	SD	K	H	E	[D]	XXP
Parameter 1						●	●	●	●	●	●	●	●	●	●	●	●	●	●
Parameter 2						●	●	●	●	●	●	●	●	●	●	●	●	●	●
ZCP Parameter 3						●	●	●	●	●	●	●	●	●	●	●	●	●	●
Parameter 4	●	●	●	●	●													●	

Features

- Compare the BIN 16-bit data of the device specified in (S1) and the value (bandwidth) of the BIN 16-bit data of the device specified in (S2) with the BIN 16-bit data of the device specified in the comparison source (S3), According to the result (bottom, area, top), one of (D), (D)+1, (D)+2 will be turned ON. (S1), (S2), (S3) are treated as BIN values within the above-mentioned setting data range. Use algebraic methods for size comparison.

- Use algebraic methods for size comparison.



(1): Even if the instruction input is OFF and the ZCP instruction is not executed, (D) to (D)+2 will keep the state before the instruction input turns from ON to OFF.

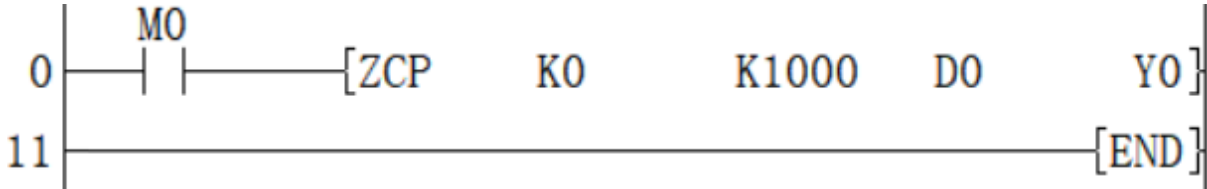
#Note:

- Please set the lower comparison value (S1) to a value smaller than the upper comparison value (S2).
- When (s1) is greater than (S2), it will be processed as (S2)=(S1).
- The device specified in 3 points (d) is occupied at the beginning. Please be careful not to overlap with other control devices.

Error code

Error code	Content
4085H	The output results of (S1), (S2) and (S3) in the read application instruction exceed the device range
4086H	The output result of (D) in write application instructions exceeds the device range

Example



When M0 is set, compare whether D0 is between 0 and 1000:

If (D0) > (1000), then Y0 is ON.

If (0) ≤ (D0) ≤ (1000), then Y1 is ON.

If (D0) < (0), then Y2 is ON.

DZCP/32-bit data interval comparison

DZCP(P)

Compare the BIN 32-bit data of the device specified in (S1) and the value (bandwidth) of the BIN 32-bit data of the device specified in (S2) with the BIN 32-bit data of the device specified in the comparison source (S3), Output the result (bottom, area, top) to the device specified in (D) and later.

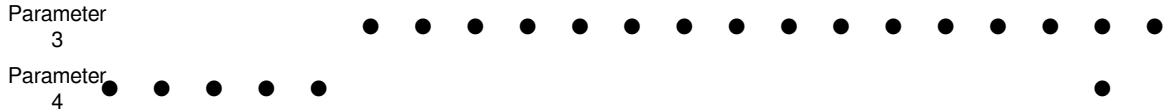
-[DZCP (S1) (S2) (S3) (D)]

Content, range and data type

Parameter	Content	Range	Data type	Data type (label)
(S1)	The comparison value data of low limit or the device that stores the comparison value data	-2147483648 to 2147483647	Signed BIN32	ANY32_S
(S2)	The comparison value data of high limit or the device that stores the comparison value data	-2147483648 to 2147483647	Signed BIN32	ANY32_S
(S3)	Comparison source data or the device that stores the comparison source data	-2147483648 to 2147483647	Signed BIN32	ANY32_S
(D)	The start bit device of output comparison result		Bit	ANYBIT_ARRAY

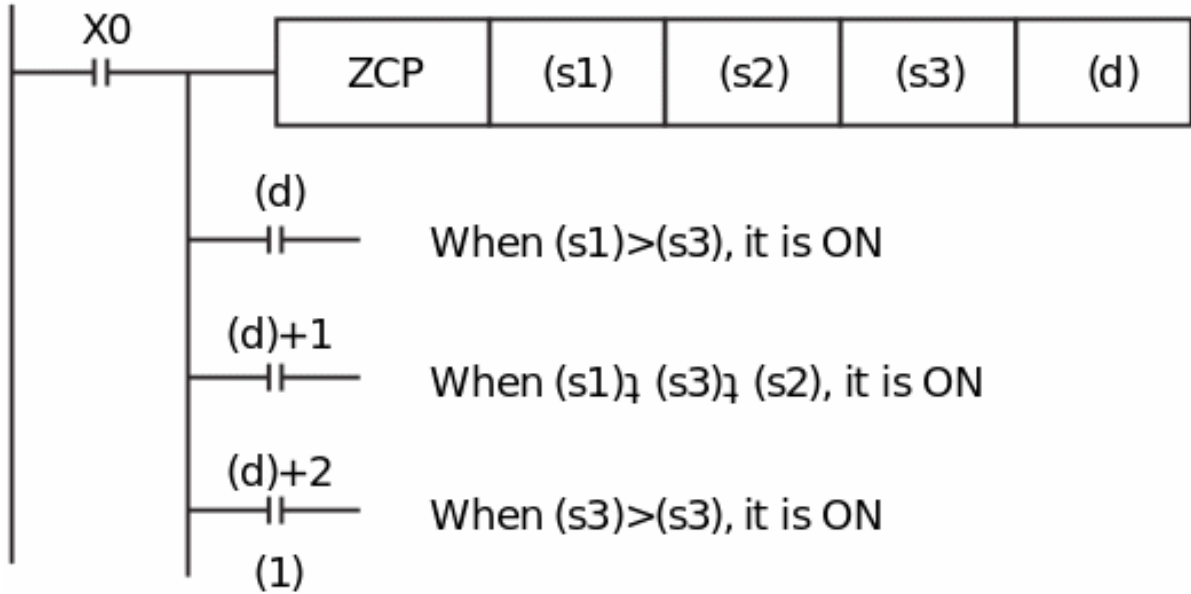
Device used

Instruction	Parameter	Devices																	Offset		Pulse		
		Y	M	S	SM	D.b	KnX	KnY	KnM	KnS	T	C	D	R	SD	LC	HSC	K	H	E	[D]	XXP	
DZCP	Parameter 1						●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
	Parameter 2						●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●



Features

- Compare the BIN 32-bit data of the device specified in (S1) and the value (bandwidth) of the BIN 32-bit data of the device specified in (S2) with the BIN 32-bit data of the device specified in the comparison source (S3) , According to the result (bottom, area, top), one of (D), (D)+1, (D)+2 will be turned ON. (S1), (S2), (S3) are treated as BIN values within the above-mentioned setting data range. Use algebraic methods for size comparison.
- Use algebraic methods for size comparison.



(1): Even if the instruction input is OFF and the ZCP instruction is not executed, (D) to (D)+2 will keep the state before the instruction input turns from ON to OFF.

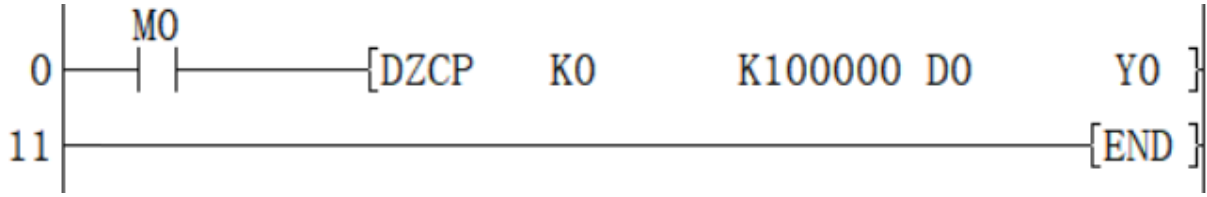
#Note:

- Please set the lower comparison value (S1) to a value smaller than the upper comparison value (S2).
- When (S1) is greater than (S2), it will be processed as (S2)=(S1).
- The device specified in 3 points (D) is occupied at the beginning. Please be careful not to overlap with other control devices.

Error code

Error code	Content
4085H	The output results of (S1), (S2) and (S3) in the read application instruction exceed the device range
4086H	The output results of (D) in the write application instruction exceeds the device range

Example



When M0 is set, compare D0 with whether it is between 0 and 100000:

If (D0) > (100000), then Y0 is ON.

If (0) ≤ (D0) ≤ (100000), then Y1 is ON.

If (D0) < (0), then Y2 is ON.

Cycle shift instruction

ROR/16-bit cycle shift right

ROR(P)

Shift the 16-bit data of the device specified in (D) to the right by (N) bits without including the carry flag.

-[ROR (D) (N)]

Content, range and data type

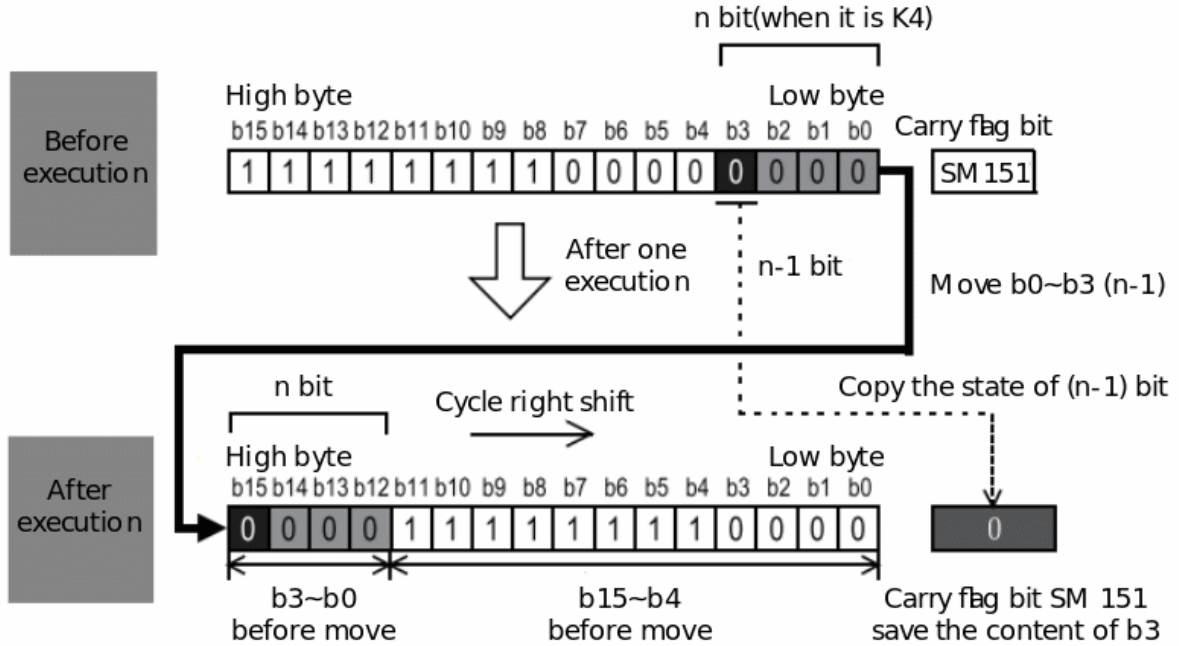
Parameter	Content	Range	Data type	Data type (label)
(D)	The device start number for cycle shift right	-	Signed BIN 16 bit	ANY16
(N)	The number of times to cycle shift right	0 to 15	Signed BIN 16 bit	ANY16

Device used

Instruction	Parameter	Devices										Offset modification	Pulse extension	
		KnX	KnY	KnM	KnS	T	C	D	R	SD	K			H
ROR	Parameter 1		●	●	●	●	●	●	●	●			●	●
	Parameter 2	●	●	●	●	●	●	●	●	●	●	●	●	●

Features

· The 16-bit data of the device specified in (D) is shifted right by (N) bits without including the carry flag. The carry flag is in the ON or OFF state according to the state before the ROR(P) is executed.



(N) Specifies 0 to 15. When a value of 16 or more is specified in (N), the remainder value of $(N) \div 16$ is shifted to the right. For example, when (N)=18, $18 \div 16 = 1$ and the remainder is 2, so a 2-bit right shift is performed.

Related device

Device	Name	Content
SM151	Carry	It turns ON when the last bit shifted from the lowest is 1.

#Note:

Do not set the number of digits (N) shifted right to a negative value.

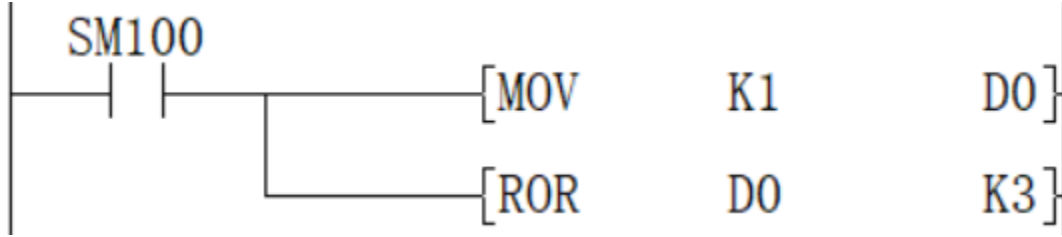
In the case of continuous execution type instructions (ROR, RCR), the right shift will be executed every scan time (operation cycle), so be careful.

When specifying the number of digits to specify the device in (D), only K4 (16-bit instruction) or K8 (32-bit instruction) is valid. (For example, K4Y10, K8M0).

Error code

Error code	Content
4084H	A negative value is specified in (N).
4085H	The output results of (D) and (N) in the read application instruction exceed the device range
4086H	The output result of (D) in the write application instruction exceeds the device range

Example



Shift the 1 in the D0 device by 3 bits to the right to get 8192.

DROR/32-bit cycle shift right

DROR(P)

Shift the 32-bit data of the device specified in (D) to the right by (N) bits without including the carry flag.

-[DROR (D) (N)]

Content, range and data type

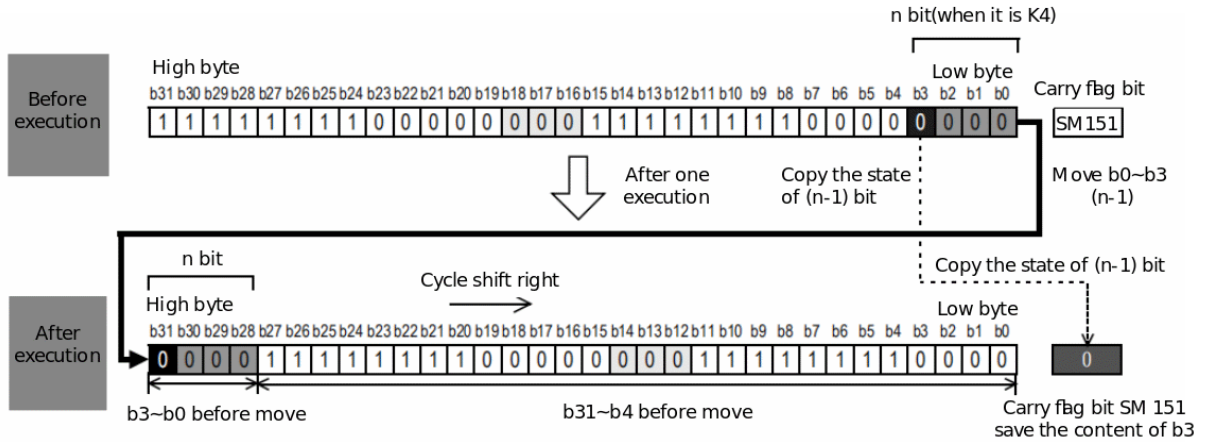
Parameter	Content	Range	Data type	Data type (label)
(D)	The device start number for cycle shift right	-	Signed BIN 32 bit	ANY32
(N)	The number of times to cycle shift right	0 to 31	Signed BIN 32 bit	ANY32

Device used

Instruction	Parameter	Devices												Offset Pulse modification		
		KnX	KnY	KnM	KnS	T	C	D	R	SD	LC	HSC	K	H	[D]	XXP
DROR	Parameter 1		●	●	●	●	●	●	●	●	●				●	●
	Parameter 2	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●

Features

- The 32-bit data of the device specified in (D) is shifted right by (N) bits without including the carry flag. The carry flag is on or off according to the state before DROR(P) is executed.



(N) Specifies 0 to 31. When a value of 32 or more is specified in (N), the remainder of (N)-32 is shifted to the right. For example, when (N)=34, $34 \div 32 = 1$ and the remainder is 2, so a 2-bit right shift is performed.

Related device

Device	Name	Content
SM151	Carry	It turns ON when the last bit shifted from the lowest is 1.

#Note:

Do not set the number of digits (N) shifted right to a negative value.

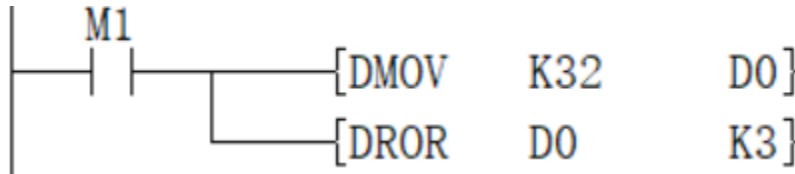
In the case of continuous execution type instructions (ROR, RCR), the right shift will be executed every scan time (operation cycle), so be careful. When specifying the number of digits to specify the device in (D), only K4 (16-bit instruction) or K8 (32-bit instruction) is valid. (For example, K4Y10, K8M0).

Error code

Error code	Content
4084H	A negative value is specified in (N).
4085H	The output results of (D) and (N) in the read application instruction exceed the device range
4086H	The output result of (D) in the write application instruction exceeds the device range

After the rising edge of M1 is triggered, the value 32 of the D0 device is shifted right by 3 bits to get 4.

Example



RCR/16-bit cycle shift right with carry

RCR(P)

Shift the 16-bit data of the device specified in (D) to the right by (N) bits with the carry flag included.

-[RCR (D) (N)]

Content, range and data type

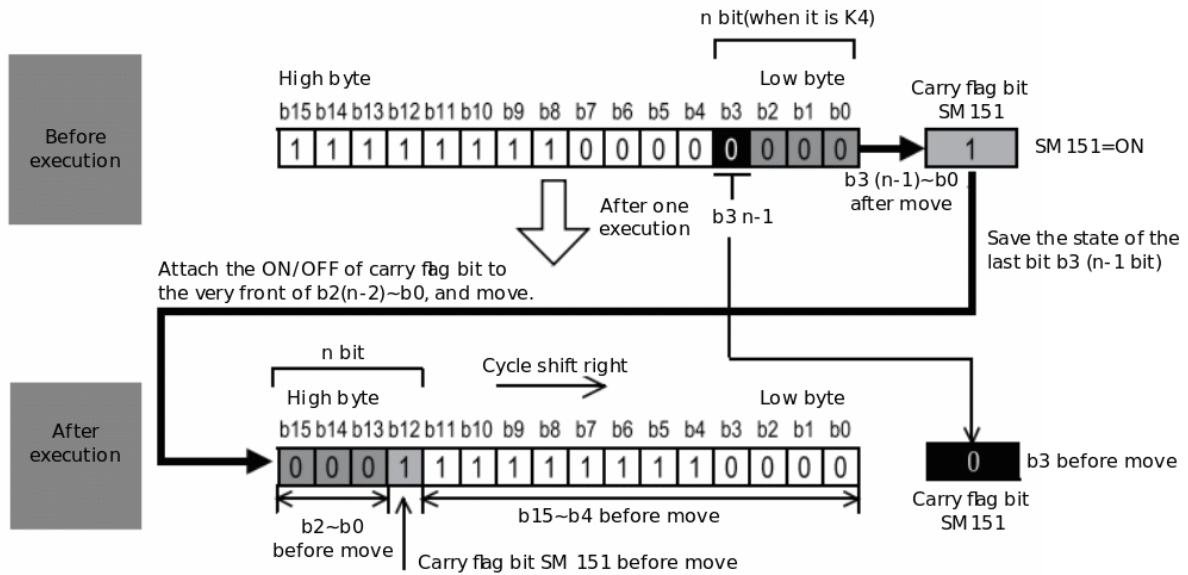
Parameter	Content	Range	Data type	Data type (label)
(D)	The device start number for cycle shift right	-	Signed BIN 16 bit	ANY16
(N)	The number of times to cycle shift right	0 to 15	Signed BIN 16 bit	ANY16

Device used

Instruction	Parameter	Devices										Offset modification	Pulse extension		
		KnX	KnY	KnM	KnS	T	C	D	R	SD	K			H	[D]
RCR	Parameter 1		●	●	●	●	●	●	●	●				●	●
	Parameter 2	●	●	●	●	●	●	●	●	●	●	●	●	●	●

Features

Shift the BIN 16-bit data of the device specified in (D) to the right by (N) bits with the carry flag included. The carry flag is on or off according to the state before the RCR(P) is executed.



(N) Specifies 0 to 15. When a value of 16 or more is specified in (N), the remainder value of (N)÷16 is shifted to the right. For example, when (N)=18, 18÷16=1 and the remainder is 2, so a 2-bit right shift is performed.

Related device

Device	Name	Content
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SM151

Carry

It turns ON when the last bit shifted from the lowest is 1.

#Note:

Do not set the number of digits (N) shifted right to a negative value.

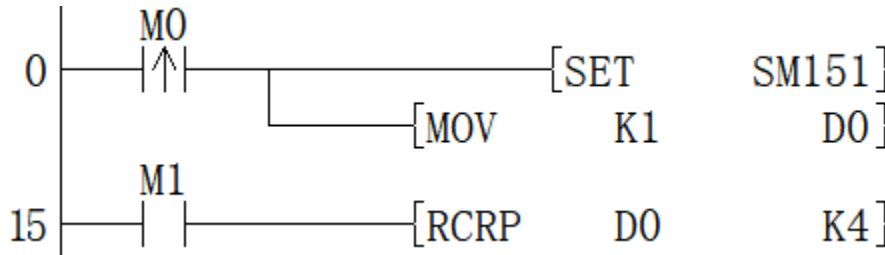
In the case of continuous execution type instructions (ROR, RCR), the right shift will be executed every scan time (operation cycle), so be careful.

When specifying the number of digits to specify the device in (D), only K4 (16-bit instruction) or K8 (32-bit instruction) is valid. (For example, K4Y10, K8M0).

Error code

Error code	Content
4084H	A negative value is specified in (N)
4085H	The output results of (D) and (N) in the read application instruction exceed the device range
4086H	The output result of (D) in the write application instruction exceeds the device range

Example



After the rising edge of M0 is triggered, the carry flag SM151 turns ON, and D0 is assigned the value 1. When M1=ON, the value in the D0 device is shifted right by 4 bits to get 12288.

DRCR/32-bit cycle shift right with carry

DRCR(P)

Shift the 32-bit data of the device specified in (D) to the right by (N) bits with the carry flag included.

-[DRCR (D) (N)]

Content, range and data type

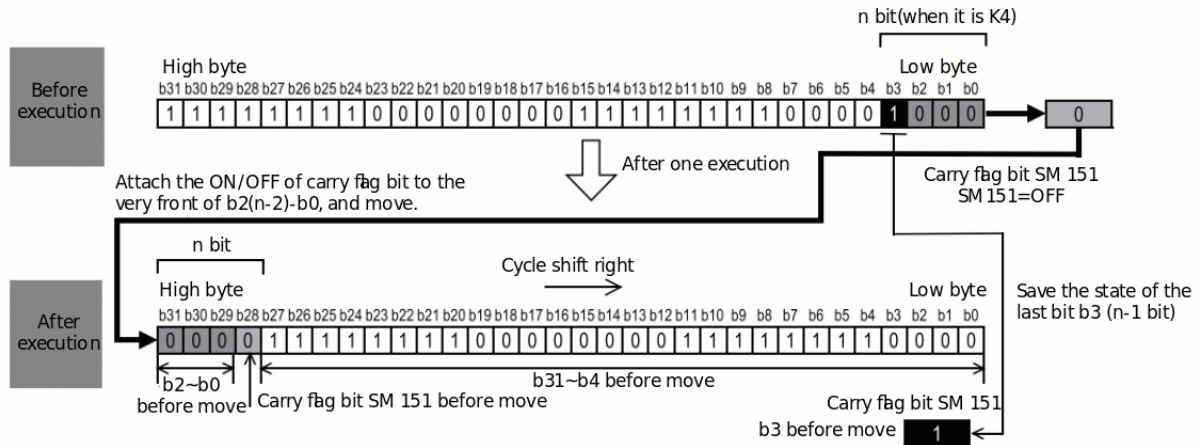
Parameter	Content	Range	Data type	Data type (label)
(D)	The device start number for cycle shift right	-	Signed BIN 32 bit	ANY32
(N)	The number of times to cycle shift right	0 to 31	Signed BIN 32 bit	ANY32

Device used

Instruction	Parameter	KnX	KnY	KnM	KnS
DRCR	Parameter 1	●	●	●	●
	Parameter 2	●	●	●	●

Features

· The BIN 32-bit data of the device specified in (D) is shifted right by (N) bits with the carry flag included. The carry flag is in the ON or OFF state according to the state before DRCR(P) is executed.



(N) Specifies 0 to 31. When a value of 32 or more is specified in (N), the remainder value of $(N) \div 32$ is shifted to the right. For example, when $(N)=34$, $34 \div 32=1$ and the remainder is 2, so a 2-bit right shift is performed.

Related device

Devices	Name	Content
SM151	Carry	It turns ON when the last bit shifted from the lowest is 1.

#Note:

Do not set the number of bits (N) to turn right to a negative value.

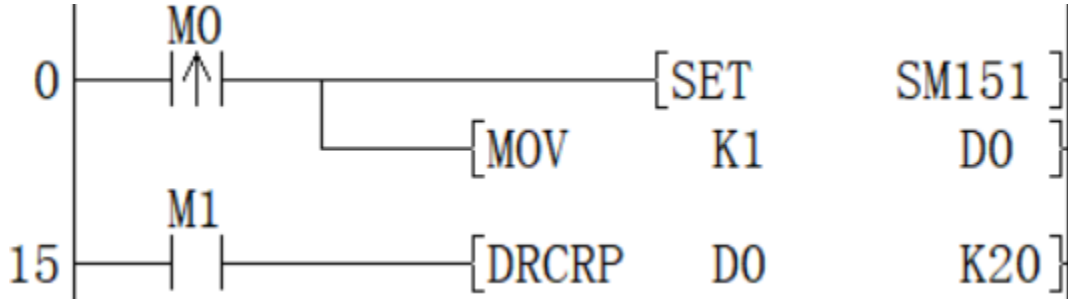
In the case of continuous execution type instructions (DROR, DRCR), the right shift will be executed every scan time (operation cycle), so be careful. When specifying the number of digits to specify the device in (D), only K4 (16-bit instruction) or K8 (32-bit instruction) is valid. (For example, K4Y10, K8M0).

Error code

Error code	Content
4084H	A negative value is specified in (N).
4085H	The output results of (D) and (N) in the read application instruction exceed the device range
4086H	The output result of (D) in the write application instruction exceeds the device range

Example

After the rising edge of M0 is triggered, the carry flag SM151 turns ON, and D0 is assigned the value 1. When M1=ON, the value in the D0 device is shifted right by 20 bits to get 12288.



ROL/16-bit cycle shift left

ROL(P)

Shift the 16-bit data of the device specified in (D) to the left by (N) bits without including the carry flag.

-[ROL (D) (N)]

Content, range and data type

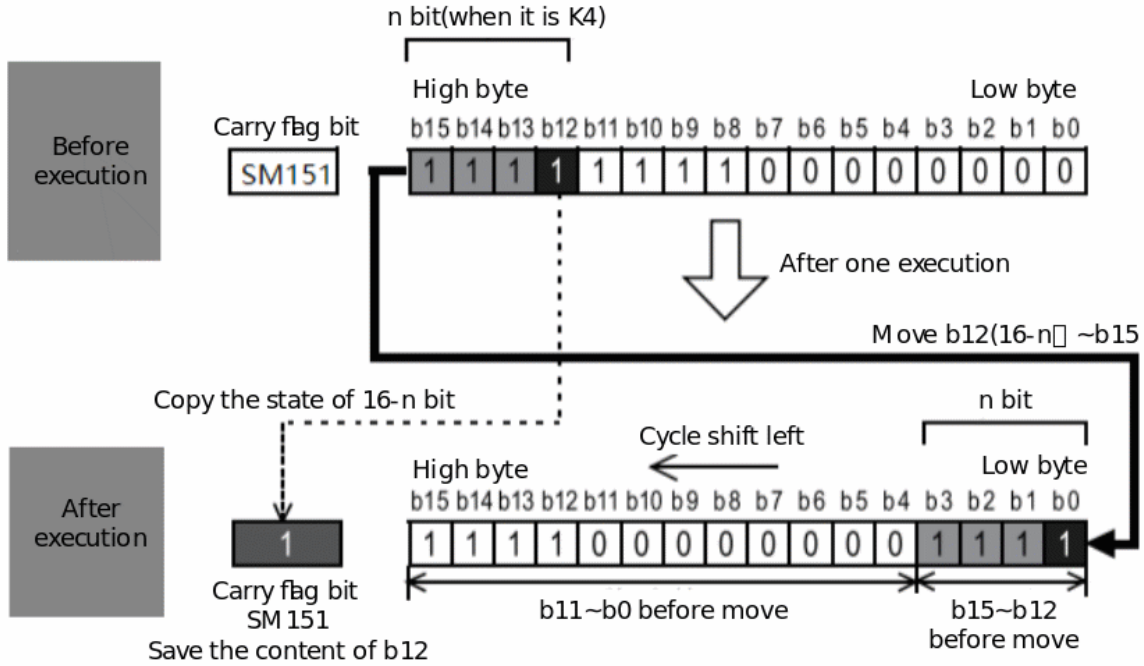
Parameter	Content	Range	Data type	Data type (label)
(D)	The device start number for cycle shift left	-	Signed BIN 16 bit	ANY16
(N)	The number of times to cycle shift left	0 to 15	Signed BIN 16 bit	ANY16

Device used

Instruction	Parameter	Devices											Offset modification [D]	Pulse extension XXP
		KnX	KnY	KnM	KnS	T	C	D	R	SD	K	H		
ROL	Parameter 1		●	●	●	●	●	●	●	●			●	●
	Parameter 2	●	●	●	●	●	●	●	●	●	●	●	●	●

Features

- The 16-bit data of the device specified in (D) is shifted to the left by (N) bits without including the carry flag. The carry flag is in the ON or OFF state according to the state before ROL(P) is executed.



(N) Specify 0 to 15. When a value of 16 or more is specified in (N), the remainder value of $(N) \div 16$ is shifted to the left. For example, when $(N)=18$, $18 \div 16=1$ and the remainder is 2, so a 2-bit left shift is performed.

Related device

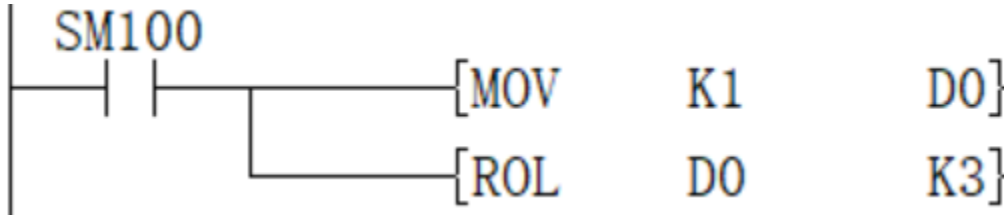
Device	Name	Content
SM151	Carry	It turns ON when the last bit shifted from the highest is 1.

#Note:

Do not set the number of digits (N) shifted to the left to a negative value. In the case of continuous execution type instructions (ROL, RCL), the shift to the left will be executed every scan time (operation cycle), so be careful. When specifying the number of digits to specify the device in (D), only K4 (16-bit instruction) or K8 (32-bit instruction) is valid. (For example, K4Y10, K8M0).

Error code

Error code	Content
4084H	A negative value is specified in (N).
4085H	The output results of (D) and (N) in the read application instruction exceed the device range
4086H	The output result of (D) in the write application instruction exceeds the device range



Example

Shift 1 in the D0 device to the left by 3 bits to get 8.

DROL/32-bit cycle shift left

DROL(P)

Shift the 32-bit data of the device specified in (D) to the left by (N) bits without including the carry flag.

-[DROL (D) (N)]

Content, range and data type

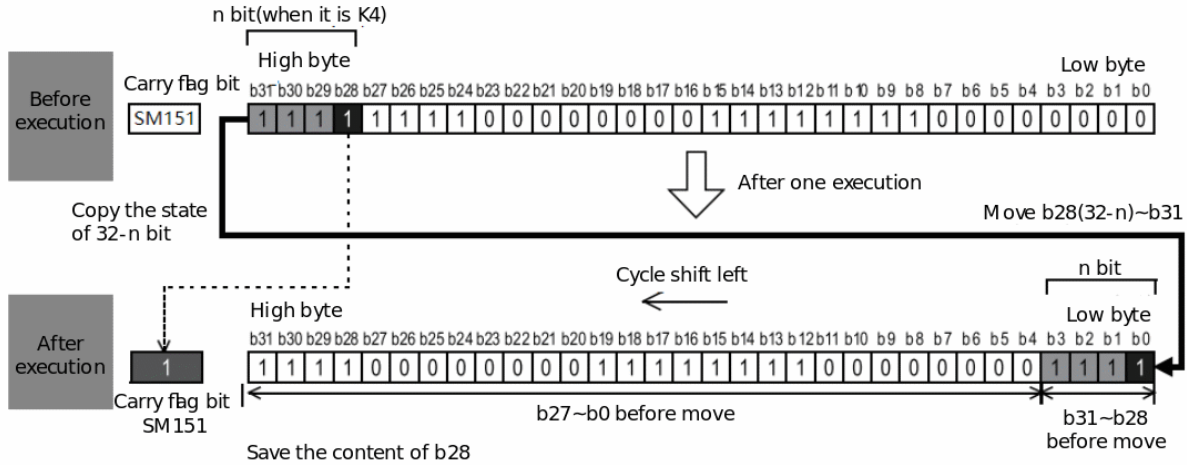
Parameter	Content	Range	Data type	Data type (label)
(D)	The device start number for cycle shift left	-	Signed BIN 32 bit	ANY32
(N)	The number of times to cycle shift left	0 to 31	Signed BIN 32 bit	ANY32

Device used

Instruction	Parameter	Devices												Offset Pulse modification dimension		
		KnX	KnY	KnM	KnS	T	C	D	R	SD	LC	HSC	K	H	[D]	XXP
DROL	Parameter 1		●	●	●	●	●	●	●	●	●				●	●
	Parameter 2	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●

Features

- The 32-bit data of the device specified in (D) is shifted left by (N) bits without including the carry flag. The carry flag is on or off according to the state before DROL(P) is executed.



(N) Specifies 0 to 31. When a value of 32 or more is specified in (N), the remainder of $(N) \div 32$ is shifted to the left. For example, when $(N)=34$, $34 \div 32=1$ and the remainder is 2, so a 2-bit left shift is performed.

Related device

Device	Name	Content
SM151	Carry	It turns ON when the last bit shifted from the highest is 1.

#Note:

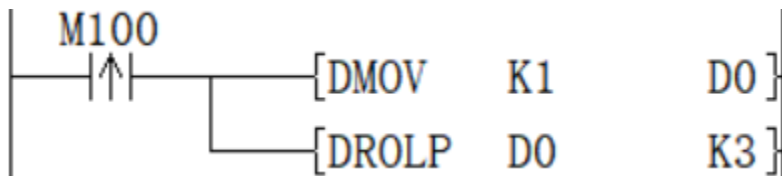
Do not set the number of digits (N) shifted to the left to a negative value.

In the case of continuous execution type instructions (ROL, RCL), the shift to the left will be executed every scan time (operation cycle), so be careful. When specifying the number of digits to specify the device in (D), only K4 (16-bit instruction) or K8 (32-bit instruction) is valid. (For example, K4Y10, K8M0).

Error code

Error code	Content
4084H	A negative value is specified in (N).
4085H	The output results of (D) and (N) in the read application instruction exceed the device range
4086H	The output result of (D) in the write application instruction exceeds the device range

Example



Shift 1 in the D0 device to the left by 3 bits to get 8.

RCL/16-bit cycle shift left with carry

RCL(P)

Shift the 16-bit data of the device specified in (D) to the left by (N) bits with the carry flag included.

-[RCL (D) (N)]

Content, range and data type

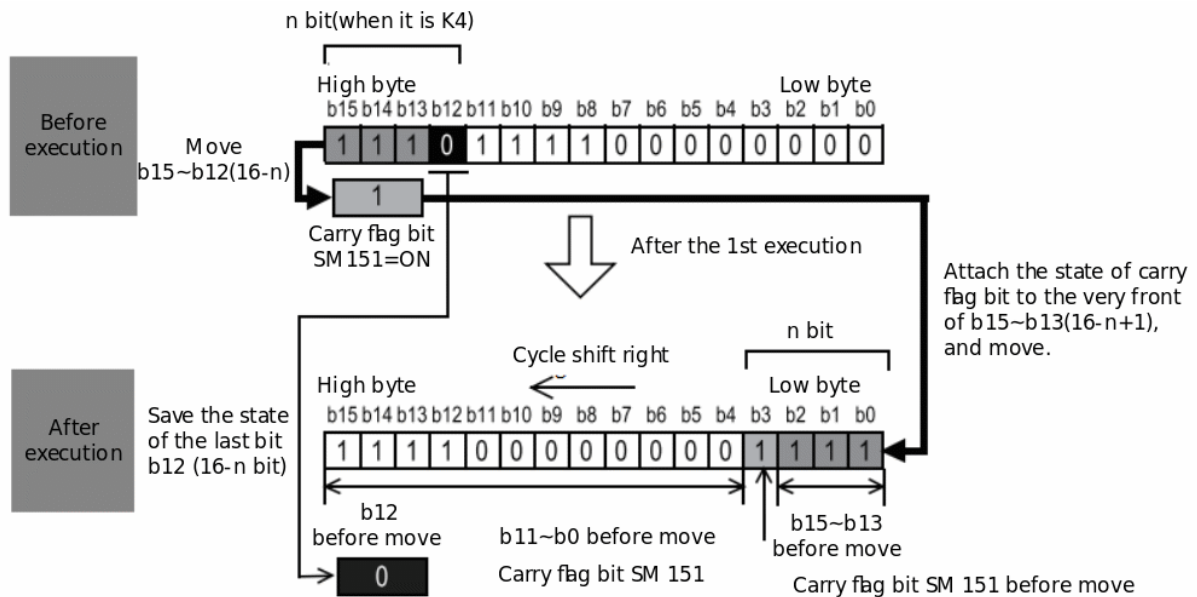
Parameter	Content	Range	Data type	Data type (label)
(D)	The device start number for cycle shift left	-	Signed BIN 16 bit	ANY16
(N)	The number of times to cycle shift left	0 to 15	Signed BIN 16 bit	ANY16

Device used

Instruction	Parameter	Devices											Offset modification	Pulse extension	
		KnX	KnY	KnM	KnS	T	C	D	R	SD	K	H			
RCL	Parameter 1		●	●	●	●	●	●	●	●				●	●
	Parameter 2	●	●	●	●	●	●	●	●	●	●	●	●	●	●

Features

The 16-bit data of the device specified in (D) is shifted (N) to the left with the carry flag included. The carry flag is on or off according to the state before RCL(P) is executed.



(N) Specifies 0 to 15. When a value of 16 or more is specified in (N), the remainder value of $(N) \div 16$ is shifted to the left. For example, when $(N)=18$, $18 \div 16=1$ and the remainder is 2, so a 2-bit left shift is performed.

Related device

Device	Name	Content
SM151	Carry	It turns ON when the last bit shifted from the highest is 1.

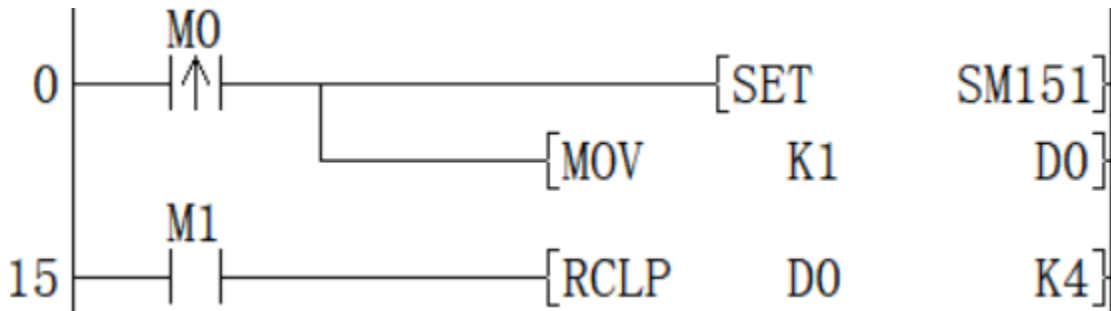
#Note:

Do not set the number of digits (N) shifted to the left to a negative value. In the case of continuous execution type instructions (ROL, RCL), the shift to the left will be executed every scan time (operation cycle), so be careful. When specifying the number of digits to specify the device in (D), only K4 (16-bit instruction) or K8 (32-bit instruction) is valid. (For example, K4Y10, K8M0).

Error code

Error code	Content
4084H	A negative value is specified in (N).
4085H	The output results of (D) and (N) in the read application instruction exceed the device range
4086H	The output result of (D) in the write application instruction exceeds the device range

Example



After the rising edge of M0 is triggered, the carry flag SM151 turns ON, and D0 is assigned the value 1.

When M1=ON, move the value in the D0 device with carry to the left by 4 bits to get 24.

DRCL/32-bit cycle shift left with carry

DRCL(P)

Move the 32-bit data of the device specified in (D) to the left by (N) bits with the carry flag included.

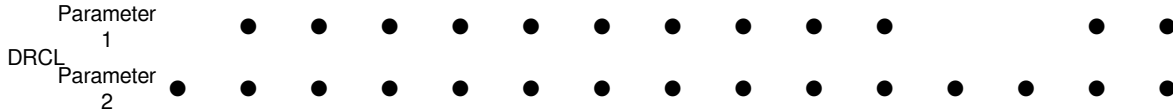
-[DRCL (D) (N)]

Content, range and data type

Parameter	Content	Range	Data type	Data type (label)
(D)	The device start number for cycle shift left	-	Signed BIN 32 bit	ANY32
(N)	The number of times to cycle shift left	0 to 31	Signed BIN 32 bit	ANY32

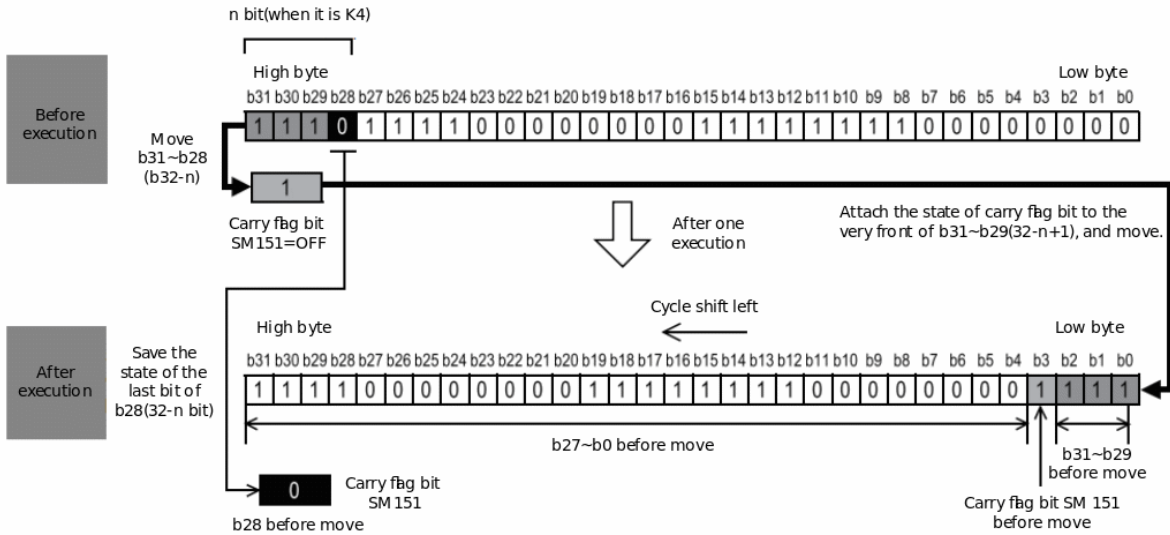
Device used

Instruction	Parameter	Devices													Offset modification	Pulse width
		KnX	KnY	KnM	KnS	T	C	D	R	SD	LC	HSC	K	H		



Features

The 32-bit data of the device specified in (D) is shifted (N) to the left with the carry flag included. The carry flag is on or off according to the state before RCL(P) is executed.



(N) Specifies 0 to 31. When a value of 32 or more is specified in (N), the remainder of (N)÷32 is shifted to the left. For example, when (N)=34, 34÷32=1 and the remainder is 2, so a 2-bit left shift is performed.

Related device

Devices	Name	Content
SM151	Carry	Turns ON when the last bit shifted from the highest is 1.

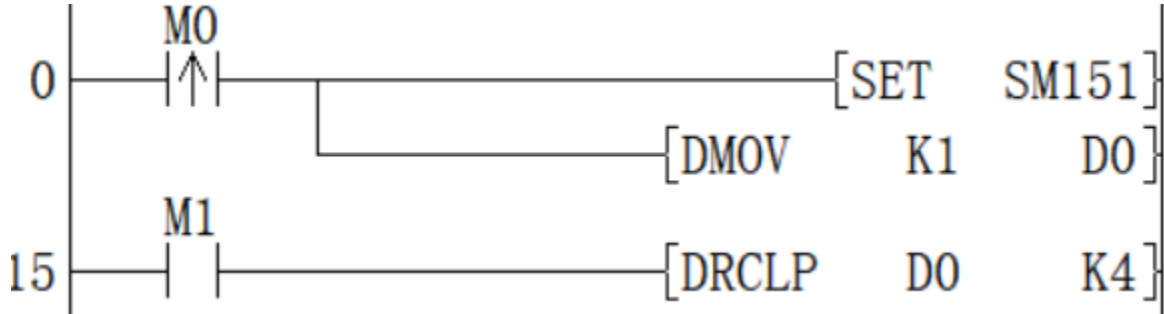
#Note:

Do not set the number of digits (N) shifted to the left to a negative value. In the case of continuous execution type instructions (ROL, RCL), the shift to the left will be executed every scan time (operation cycle), so be careful. When specifying the number of digits to specify the device in (D), only K4 (16-bit instruction) or K8 (32-bit instruction) is valid. (For example, K4Y10, K8M0).

Error code

Error code	Content
4084H	A negative value is specified in (N).
4085H	The output results of (D) and (N) in the read application instruction exceed the device range
4086H	The output result of (D) in the write application instruction exceeds the device range

Example



After the rising edge of M0 is triggered, the carry flag SM151 turns ON, and D0 is assigned the value 1. When M1=ON, carry the value in the D0 device to the left by 4 bits to get 24.

SFTR/n-bit shift right of n-bit data

SFTR(P)

Shift (N2) the data of the start (N1) bits of the device specified in (D) to the right.

-[SFTR (S) (D) (N1) (N2)]

Content, range and data type

Parameter	Content	Range	Data type	Data type (label)
(S)	The start number of the device storing the shifted data after shifting	-	Bit	ANY_BOOL
(D)	The shifted device start number	-	Bit	ANY_BOOL
(N1)	The length of shifted data	0 to 32767	Signed BIN 16 bit	ANY16
(N2)	Number of shifts	0 to 32767	Signed BIN 16 bit	ANY16

Device used

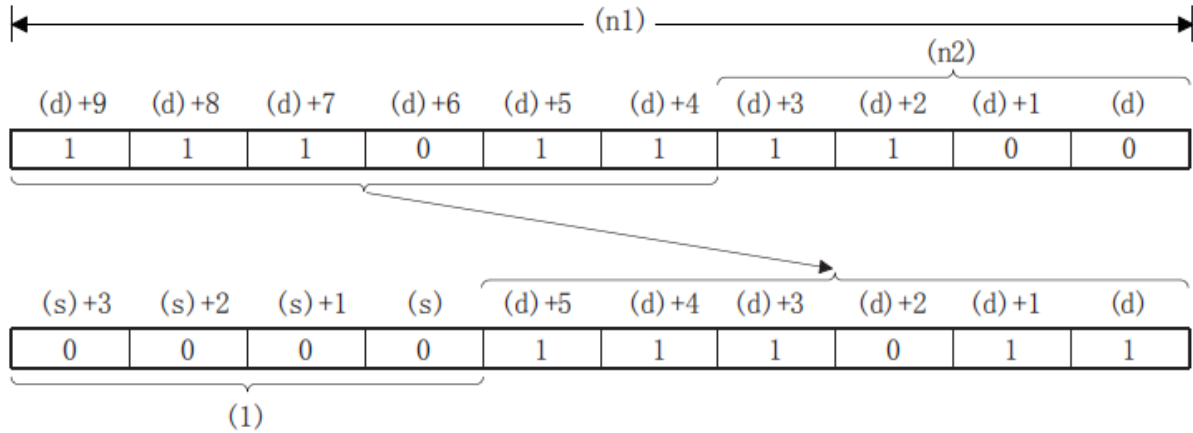
Instruction	Parameter	Devices																Offset modification	Pulse extension			
		X	Y	M	S	SM	D.b	KnX	KnY	KnM	KnS	T	C	D	R	SD	K			H	[D]	XXP
SFTR	Parameter 1	●	●	●	●	●														●	●	
	Parameter 2		●	●	●	●															●	●
	Parameter 3							●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
	Parameter 4							●	●	●	●	●	●	●	●	●	●	●	●	●	●	●

Features

Shift (N2) the data of the start (N1) bits of the device specified in (D) to the right. After shifting, the point (N2) starting from (S) is transferred to the point (N2) starting from (D) + (N1 to N2).

When K0 is specified in (S), the bit of the (D) + (N1 to N2) starting point (N2) after the shift is set to 0.

When K1 is specified in (S), the bit of the (D) + (N1 to N2) starting point (N2) after the shift is set to 1.



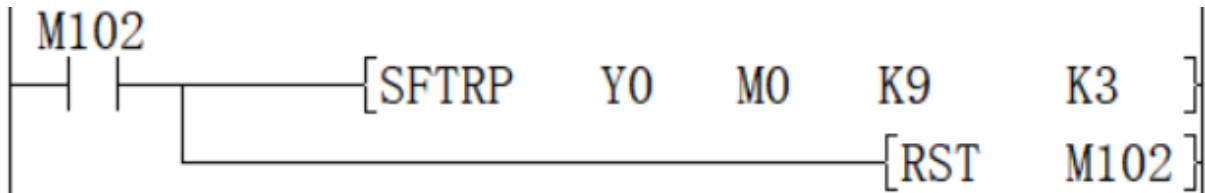
(1): When (S)=K0, it becomes 0.

Error code

Error code	Content
4084H	When the value specified in (N1) and (N2) exceeds the range of 0 to 32767
4085H	When the value specified in (N1) and (N2) is (N1)<(N2)
4086H	When the device specified in read application instructions (S), (D), (N1) and (N2) exceeds the corresponding device range
4086H	When the device specified in the write application instruction (D) exceeds the corresponding device range

Example

For N1=9 bits (the length of the shift register) data starting with M0, right shift N2=3 bits. After shifting, transfer N2=3 bits from Y0 to N2=3 bits from M6.



SFTL/n-bit shift left of n-bit data

SFTL(P)

Shift the start (N1) bit data of the device specified in (D) to the left by (N2) bits.

-[SFTL (S) (D) (N1) (N2)]

Content, range and data type

Parameter	Content	Range	Data type	Data type (label)
(S)	The start number of the device storing shifted data after shifting	-	Bit	ANY_BOOL
(D)	The shifted device start number	-	Bit	ANY_BOOL
(N1)	The length of shifted data	0 to 32767	Signed BIN 16 bit	ANY16
(N2)	Number of shifts	0 to 32767	Signed BIN 16 bit	ANY16

Device used

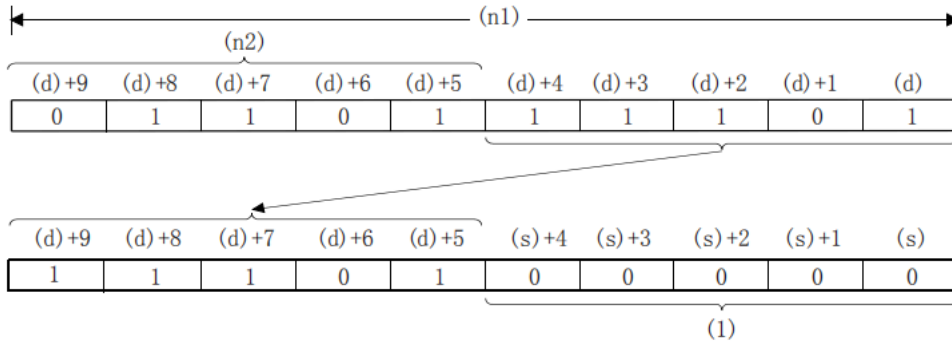
Instruction	Parameter	Devices														Offset modification		Pulse extension		
		X	Y	M	S	SM	D.b	KnX	KnY	KnM	KnS	T	C	D	R	SD	K	H	[D]	XXP
SFTL	Parameter 1	●	●	●	●	●													●	●
	Parameter 2		●	●	●	●													●	●
	Parameter 3							●	●	●	●	●	●	●	●	●	●	●	●	●
	Parameter 4							●	●	●	●	●	●	●	●	●	●	●	●	●

Features

Shift (N2) bits of the data at the beginning (N1) bits of the device specified in (D). After shifting, the point (N2) starting from (S) is transferred to the point (N2) starting from (D) + (N1 to N2).

When K0 is specified in (S), the bit of the (D) + (N1 to N2) starting point (N2) after the shift is set to 0.

When K1 is specified in (S), the bit of the (D) + (N1 to N2) starting point (N2) after the shift is set to 1.



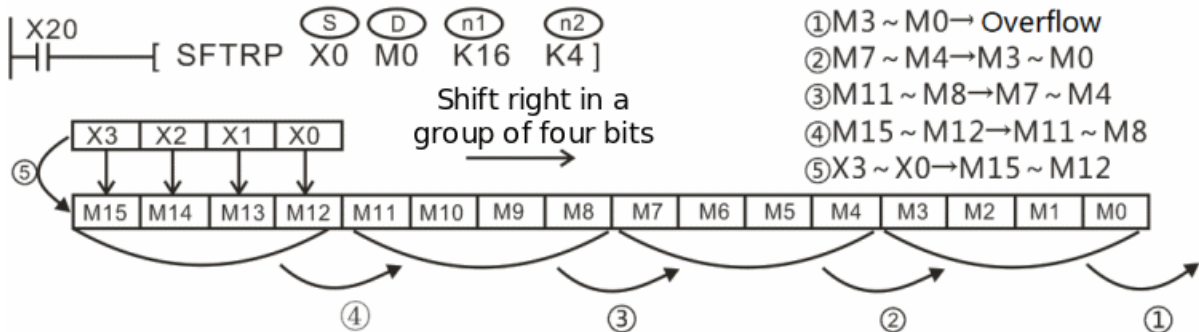
(1): When (S)=K0, it becomes 0.

Error code

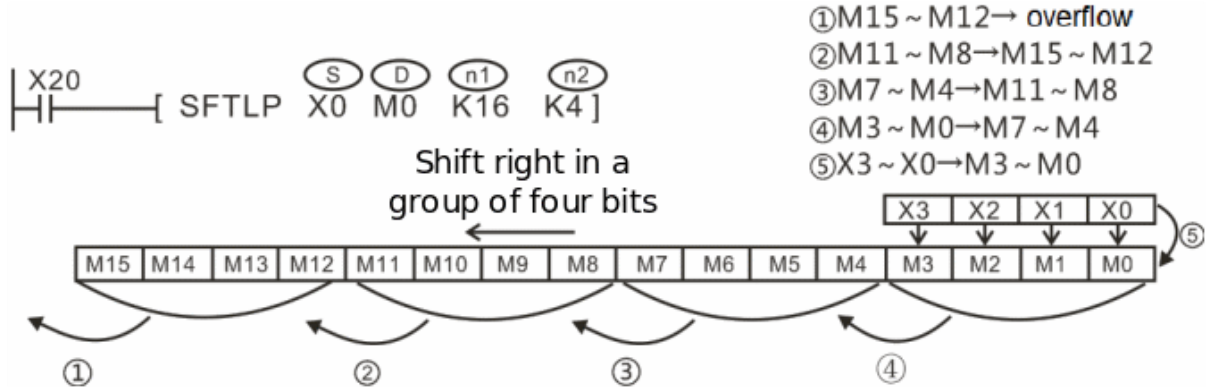
Error code	Content
4084H	When the value specified in (N1) and (N2) exceeds the range of 0 to 32767
4085H	When the value specified in (N1) and (N2) is (N1)<(N2)
4086H	When the device specified in read application instructions (S), (D), (N1) and (N2) exceeds the corresponding device range
4086H	When the device specified in the write application instruction (D) exceeds the corresponding device range

Example

Example 1:



Example 2:



WSFR/n-word shift right of n-word data

WSFR(P)

Shift (N2) the data of the start (N1) bits of the device specified in (D) to the right.

-[WSFR (S) (D) (N1) (N2)]

Content, range and data type

Parameter	Content	Range	Data type	Data type (label)
(S)	The start number of the device storing shifted data after shifting	-	word	ANY_BOOL
(D)	The shifted device start number	-	word	ANY_BOOL
(N1)	The length of shifted data	0 to 32767	Signed BIN 16 bit	ANY16
(N2)	Number of shifts	0 to 32767	Signed BIN 16 bit	ANY16

Device used

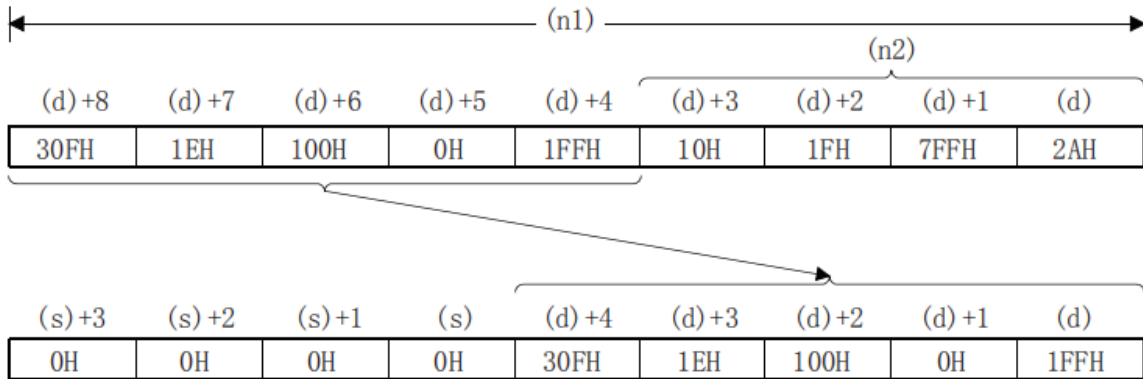
Instruction	Parameter	Devices											Offset modification	Pulse extension
		KnX	KnY	KnM	KnS	T	C	D	R	SD	K	H		
SFTR	Parameter 1	●	●	●	●	●	●	●	●	●	●	●	●	●
	Parameter 2		●	●	●	●	●	●	●	●			●	●
	Parameter 3	●	●	●	●	●	●	●	●	●	●	●	●	●
	Parameter 4	●	●	●	●	●	●	●	●	●	●	●	●	●

Features

Shift (N2) the data of the beginning (N1) word of the device specified in (D) to the right. After shifting, the point (N2) starting from (S) is transferred to the point (N2) starting from (D) + (N1 to N2).

When K is specified in (S), the device at (D) + (N1 to N2) starting (N2) point after shifting is set to the specified value.

If the value specified in (N1) or (N2) is 0, it will be no processing.



Error code

Error code	Content
4084H	When the value specified in (N1) and (N2) exceeds the range of 0 to 32767
4085H	When the value specified in (N1) and (N2) is (N1)<(N2)
4086H	When (S) and (D) both specify KnM, KnX, and KnS, the value of n varies.
	When the device specified in read application instructions (S), (D), (N1) and (N2) exceeds the corresponding device range
	When the device specified in the write application instruction (D) exceeds the corresponding device range

Example

(S) and (D) specify the same multiple in the digit specified device. This program realizes to shift Y0 to Y7 bits right, shift Y10 to Y17 right to Y0 to Y7, and then store X0 to X7 to Y10 to Y17.



WSFL/n-word shift left of n-word data

WSFL(P)

Shift the start (N1) bit data of the device specified in (D) to the left by (N2) bits.

-[WSFL (S) (D) (N1) (N2)]

Content, range and data type

Parameter	Content	Range	Data type	Data type (label)
(S)	The start number of the device storing shifted data after shifting	-	Word	ANY_BOOL
(D)	The shifted device start number	-	Word	ANY_BOOL
(N1)	The length of shifted data	0 to 32767	Signed BIN 16 bit	ANY16
(N2)	Number of shifts	0 to 32767	Signed BIN 16 bit	ANY16

Device used

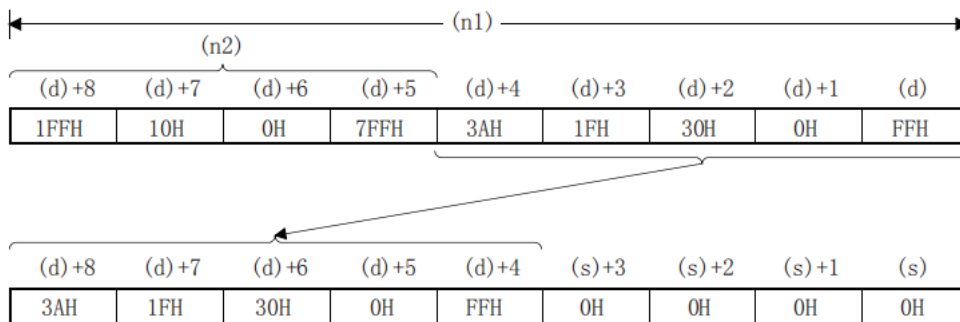
Instruction	Parameter	Devices											Offset	Pulse
		KnX	KnY	KnM	KnS	T	C	D	R	SD	K	H	[D]	extension
SFTR	Parameter 1	●	●	●	●	●	●	●	●	●	●	●	●	●
	Parameter 2		●	●	●	●	●	●	●	●			●	●
	Parameter 3	●	●	●	●	●	●	●	●	●	●	●	●	●
	Parameter 4	●	●	●	●	●	●	●	●	●	●	●	●	●

Features

Shift (N2) the data of the beginning (N1) word of the device specified in (D) to the left. After shifting, transfer the point (N2) starting from (S) to the point (N2) starting from (D).

When K is specified in (S), the device at (D) + (N1 to N2) starting (N2) point after shifting is set to the specified value.

If the value specified in (N1) or (N2) is 0, it will be no processing.



Error Code

Error code	Content
4084H	When the value specified in (N1) and (N2) exceeds the range of 0 to 32767
4085H	When the value specified in (N1) and (N2) is (N1)<(N2) When (S) and (D) both specify KnM, KnX, and KnS, the value of n varies.
4086H	When the device specified in read application instructions (S), (D), (N1) and (N2) exceeds the corresponding device range
4086H	When the device specified in the write application instruction (D) exceeds the corresponding device range

Example

(S), (D) Do the same multiple specification in the digit specification device. This program realizes to remove the high bits of Y10 to Y17 left, move Y0 to Y7 left to Y10 to Y17, and then store X0 to X7 to Y0 to Y7.



SFR/n-bit shift right of 16-bit data

SFR(P)

Shift the 16-bit data of the device specified in (D) right by (N) bits.

-[SFR (D) (N)]

Content, range and data type

Parameter	Content	Range	Data type	Data type (label)
(D)	The start number of the device storing the shifted data	-	Signed BIN 16 bit	ANY16
(N)	Number of shifts	0-15	Signed BIN 16 bit	ANY16

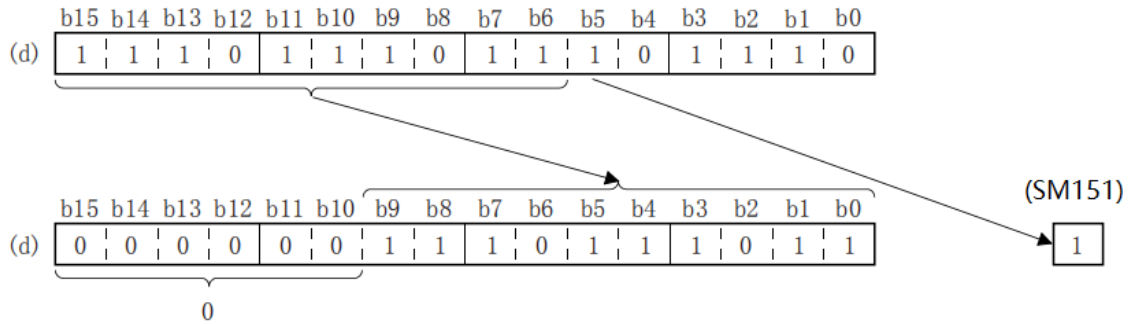
Device used

Instruction	Devices	Offset modification	Pulse extension
Parameter 1	K K K M S C D F S D K H	[D]	XXP
SFR Parameter 2	●●●●●●●●●●●●●●●●	●	●

Features

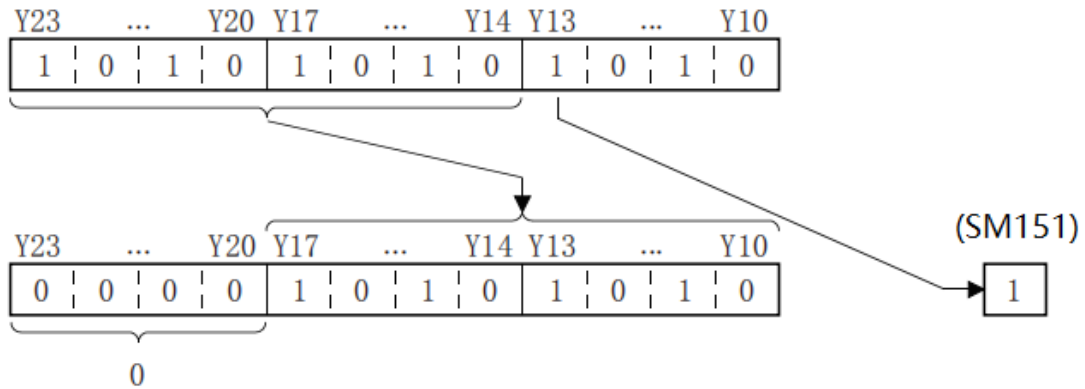
When (N)=6

Shift the 16-bit data of the device specified in (D) to the right (N) bits from the highest bit. The (N) bit from the most significant bit will become 0.



When (N)=6

When a bit device is specified in (d), the device range specified in the digit specification is shifted to the right.



(N) Specifies 0 to 15. When a value of 16 or more is specified in (N), the remainder of $(N) \div 16$ is shifted to the left. For example, when $(N)=18$, $18 \div 16=1$ and the remainder 2, so it is shifted by 2 bits to the right.

Related device nbsp;

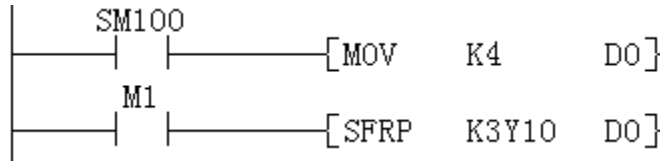
Device	Name	Content
SM151	Carry	Set to ON/OFF according to the state of N-1 bit (1/0)

Error code

Error code	Content
4084H	A negative value is specified in (N).
4085H	The output results of (D) and (N) in the read application instruction exceed the device range
4086H	The output result of (D) in the write application instruction exceeds the device range

Example

When M1 is ON, the contents of Y10 to Y23 are shifted to the right by the number of digits specified in D0.



DSFR/n word data shift right by 1 word

DSFR(P)

Shift the data at the start (N) point of the device specified in (D) to the right by 1 word.

-[DSFR (D) (N)]

Content, range and data type

Parameter	Content	Range	Data type	Data type (label)
(D)	The start number of the device storing the shifted data	-	Signed BIN 16 bit	ANY16

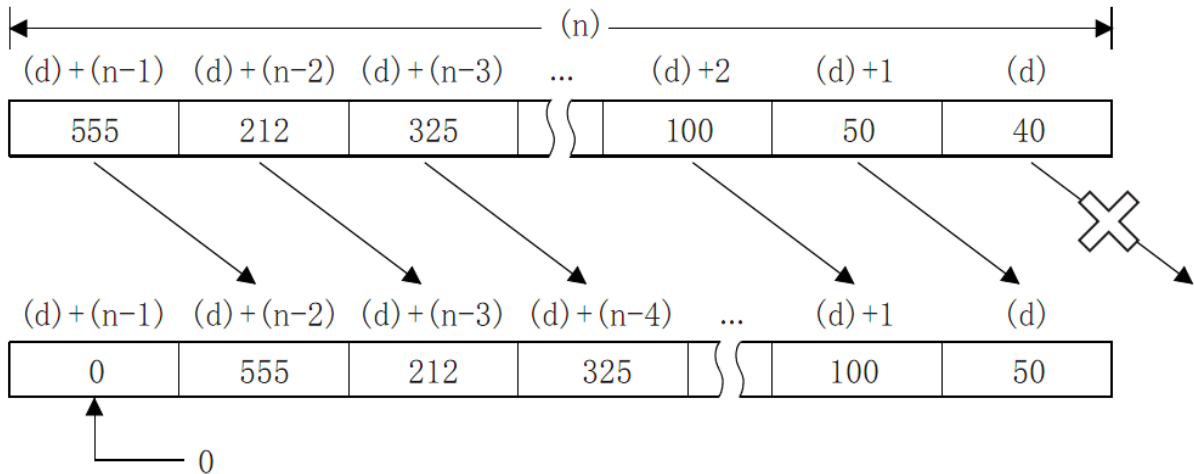
(N) Number of shifts 0 to 32767 Signed BIN 16 bit ANY16

Device used

Instruction	Parameter	Devices										Offset modification [D]	Pulse extension XXP	
		KnX	KnY	KnM	KnS	T	C	D	R	SD	K			H
DSFR	Parameter 1		●	●	●	●	●	●	●	●			●	●
	Parameter 2	●	●	●	●	●	●	●	●	●	●	●	●	●

Features

- Shift the data at the start (N) point of the device specified in (D) by 1 word to the right.



- The device specified in (D)+(N-1) will become 0.

#Note: In (D), when specifying the device number by specifying the number of bits of the bit device, the device number should be a multiple of 16 (0, 16, 32, 64...), and only K4 should be specified for the number of bits. When the number of bits is not K4, K4 is used for processing.

Error code

Error code	Content
4084H	When the value specified in (N) exceeds the range of 0 to 32767
4085H	The output results of (D) and (N) in the read application instruction exceed the device range
4086H	The output result of (D) in the write application instruction exceeds the device range

Example

When M1 is ON, shift the contents of D0 to D4 to the right by 1 word (D1→D0, D2→D1, D3→D2, D4→D3, D4 is set to 0).



Before execution:

After execution:

SFL/n-bit shift left of 16-bit data

SFL(P)

Shift the 16-bit data of the device specified in (D) to the left by (N) bits.

-[SFL (D) (N)]

Content, range and data type

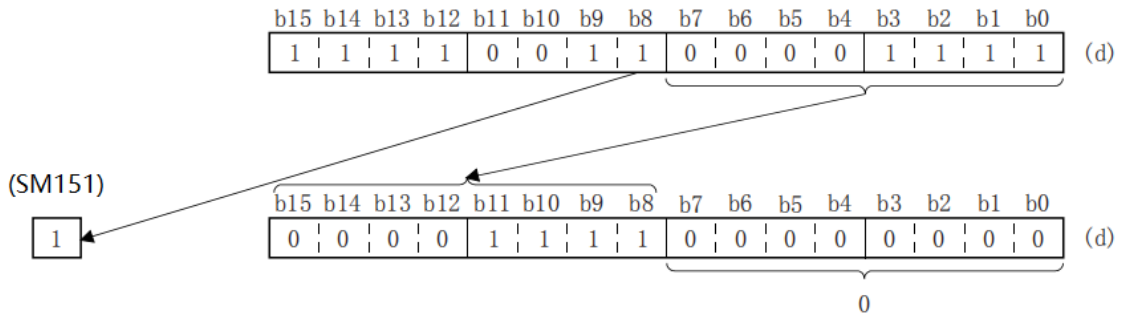
Parameter	Content	Range	Data type	Data type (label)
(D)	The start number of the device storing the shifted data	-	Signed BIN 16 bit	ANY16
(N)	Number of shifts	0 to 15	Signed BIN 16 bit	ANY16

Device used

Instruction	Parameter	Devices										Offset modification	Pulse extension	
		KnX	KnY	KnM	KnS	T	C	D	R	SD	K			H
SFL	Parameter 1		●	●	●	●	●	●	●	●			●	●
	Parameter 2	●	●	●	●	●	●	●	●	●	●	●	●	●

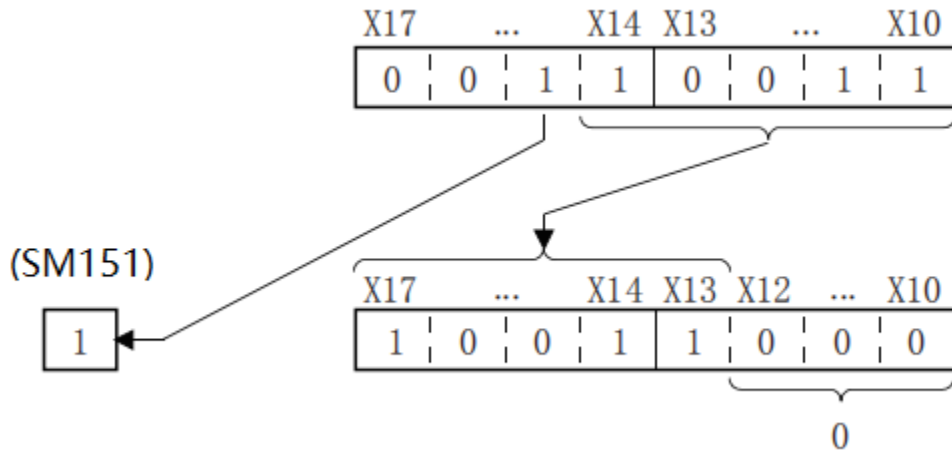
Features

Shift the 16-bit data of the device specified in (D) to the left (N) bits from the lowest bit. The (N) bit from the lowest bit will become 0.



When (N)=8, it is as follows.

When a bit device is specified in (D), the left shift is performed in the device range specified in the digit specification.



When (N)=3, it is as follows.

(N) Specify 0 to 15. When a value of 16 or more is specified in (N), the remainder of $(N) \div 16$ is shifted to the left. For example, when (N)=18, $18 \div 16 = 1$ remainder 2, so it is shifted by 2 bits to the left.

Related device

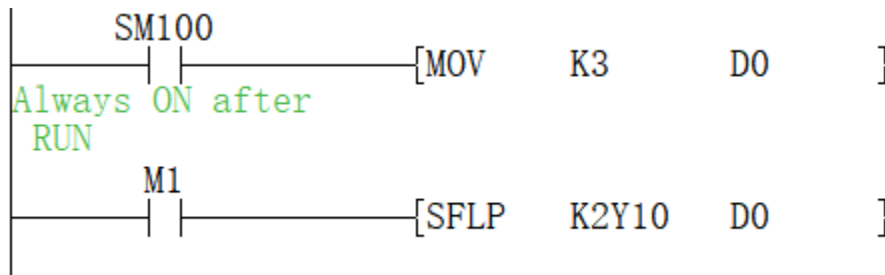
Device	Name	Content
SM151	Carry	Turn ON/OFF according to the state of N +1 bit (1/0)

Error code

Error code	Content
4084H	A negative value is specified in (N).
4085H	The output results of (D) and (N) in the read application instruction exceed the device range
4086H	The output result of (D) in the write application instruction exceeds the device range

Example

When M1 is ON, the contents of Y10 to Y17 are shifted to the left by the number of digits specified in D0.



DSFL/one word shift left of n word data

DSFL(P)

Move the data at the beginning (N) point of the device specified in (D) by 1 word to the left.

-[DSFL (D) (N)]

Content, range and data type

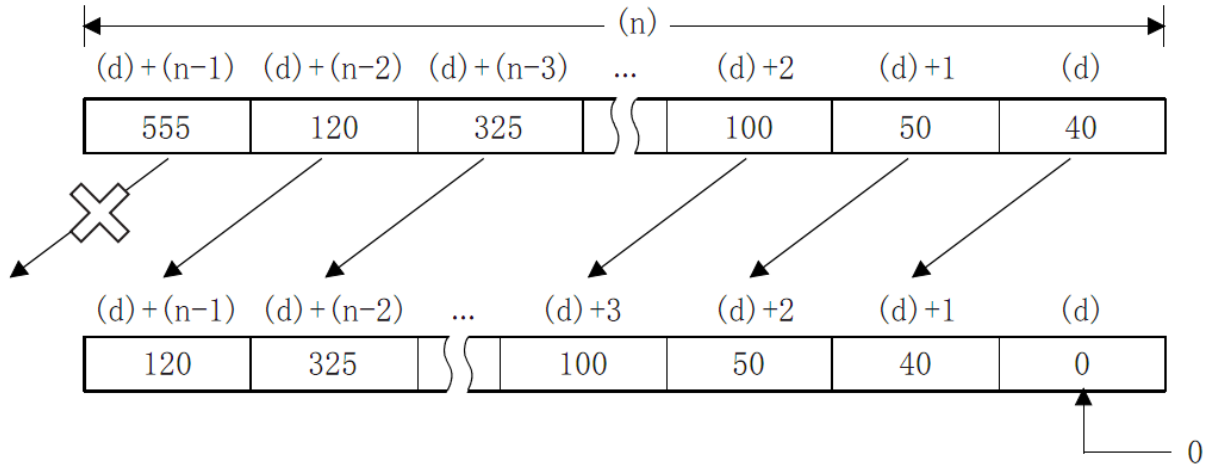
Parameter	Content	Range	Data type	Data type (label)
(D)	The start number of the device storing the shifted data	-	Signed BIN 16 bit	ANY16
(N)	Number of shifts	0 to 32,767	Signed BIN 16 bit	ANY16

Device used

Instruction	Parameter	Devices										Offset modification	Pulse extension	
		KnX	KnY	KnM	KnS	T	C	D	R	SD	K			H
DSFL	Parameter 1		●	●	●	●	●	●	●	●			●	●
	Parameter 2	●	●	●	●	●	●	●	●	●	●	●	●	●

Features

Shift the data at the start (N) point of the device specified in (D) to the left by 1 word.



The device specified in (D) will become 0.

#Note: In (D), when specifying the device number by specifying the number of bits of the bit device, the device number should be a multiple of 16 (0, 16, 32, 64...), and only K4 should be specified for the number of bits. When the number of bits is not K4, K4 is used for processing.

Error code

Error code	Content
4084H	When the value specified in (N) exceeds the range of 0 to 32,767
4085H	The output results of (D) and (N) in the read application instruction exceed the device range
4086H	The output result of (D) in the write application instruction exceeds the device range

Example

When M1 is ON, shift the contents of D0 to D4 to the left by 1 word (D3→D4, D2→D3, D1→D2, D0→D1, D0 is set to 0).



Before execution:

After execution:

Arithmetic operation instructions

ADD/16-bit addition operation

ADD(P)

Add the BIN 16-bit data specified in (S1) and the BIN 16-bit data specified in (S2), and store the result in the device specified in (D).

-[ADD (S1) (S2) (D)]

Content, range and data type

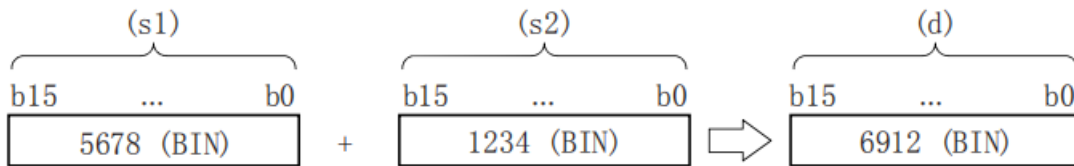
Parameter	Content	Range	Data type	Data type (label)
(S1)	Addition operation data or the device storing the addition data	-32768 to 32767	Signed BIN16	ANY16_S
(S2)	Addition operation data or the device storing the addition data	-32768 to 32767	Signed BIN16	ANY16_S
(D)	Device for storing operation results		Signed BIN16	ANY16_S

Device used

Instruction	Parameter	Devices											Offset modification	Pulse extension
		KnX	KnY	KnM	KnS	T	C	D	R	SD	K	H		
ADD	Parameter 1	●	●	●	●	●	●	●	●	●	●	●	●	●
	Parameter 2	●	●	●	●	●	●	●	●	●	●	●	●	●
	Parameter 3		●	●	●	●	●	●	●	●			●	●

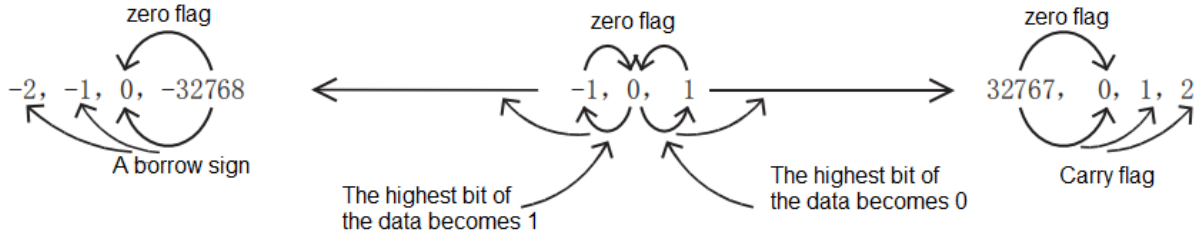
Features

Add the BIN 16-bit data specified in (S1) and the BIN 16-bit data specified in (S2), and store the result of the addition in the device specified in (D).



Related device

Devices	Name	Content
SM151	Carry	When the operation result exceeds 32,767, the carry flag will be (ON).
SM152	Borrow	When the operation result is less than -32,768, the borrow flag will be (ON).
SM153	Zero point	When the operation result is 0, the zero flag will be (ON).



#Note:

1. When the source operand and destination operand are specified as the same device:

The source operand and destination operand can also be specified as the same device number.

In this case, if you use continuous execution instructions (ADD, DADD), the result of the addition operation will change every operation cycle.

2. The difference between the ADD instruction and the INC instruction using the +1 addition operation program:

ADD[P] means that every time X001 changes from OFF to ON, the content of D0 is added by one operation.

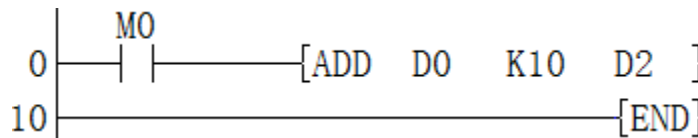
Although this instruction is very similar to the INCP instruction described later, there are some differences in the following content.

Flag bit (zero, borrow, carry)		ADD/ADDP/DADD/DADDP instructions	INC/INCP/DINC/DINCP instructions
		Action	No action
Calculation result	16-bit operation result	(S) + (+1) = (D) 32767 → 0 → +1 → +2 →	32767 → -32768 → 32767
	operation result	(S) + (-1) = (D) ← -2 ← -1 ← 0 ← -32768	---
	32-bit operation result	(S) + (+1) = (D) 2147483647 → 0 → +1 → +2 →	2147483647 → -2147483648 → -2147483647
	operation result	(S) + (-1) = (D) ← -2 ← -1 ← 0 ← -2147483648	---

Error code

Error code	Content
4085H	The output results of (S1) and (S2) in the read application instruction exceed the device range
4086H	The output result of (D) in the write application instruction exceeds the device range

Example



Add 10 to the data in (D0), and store the operation result in (D2), that is, (D0) + 10 → (D2).

DADD/32-bit addition operation

DADD(P)

Add the BIN32-bit data specified in (S1) and the BIN32-bit data specified in (S2), and store the result in the device specified in (D).

-[DADD (S1) (S2) (D)]

Content, range and data type

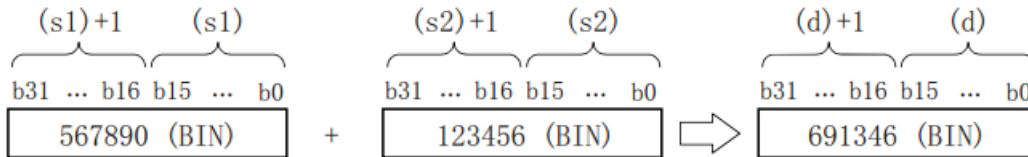
Parameter	Content	Range	Data type	Data type (label)
(S1)	Addition data or the device storing the addition data	-2147483648 to 2147483647	Signed BIN32	ANY32_S
(S2)	Addition data or the device storing the addition data	-2147483648 to 2147483647	Signed BIN32	ANY32_S
(D)	Device for storing operation results		Signed BIN32	ANY32_S

Device used

Instruc	Parameter	Devices												Offset Pulse modification		
		KnX	KnY	KnM	KnS	T	C	D	R	SD	LC	HSC	K	H	[D]	XXP
DADD	Parameter 1	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
	Parameter 2	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
	Parameter 3		●	●	●	●	●	●	●	●					●	●

Features

Add the BIN32-bit data specified in (s1) and the BIN32-bit data specified in (s2), and store the result of the addition in the device specified in (d).



Related device nbsp;:

Devices	Name	Content
SM151	Carry	When the operation result exceeds 32,767, the carry flag will be (ON).
SM152	Borrow	When the operation result is less than -32,768, the borrow flag will be (ON).
SM153	Zero point	When the operation result is 0, the zero flag will be (ON).

#Note:

1. When the source operand and destination operand are specified as the same device:

The source operand and destination operand can also be specified as the same device number.

In this case, if you use continuous execution instructions (ADD, DADD), the result of the addition operation will change every operation cycle. Please note.

2. The difference between the ADD instruction and the INC instruction using the +1 addition operation program:

ADD[P] means that every time X001 changes from OFF to ON, the content of D0 is added by one operation.

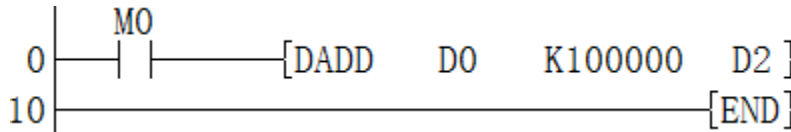
Although this instruction is very similar to the INCP instruction described later, there are some differences in the following content.

	Flag bit (zero, borrow, carry)	ADD/ADDP/DADD/DADDP instructions		INC/INCP/DINC/DINCP instructions	
		Action	No action		
Calculation result	16-bit	(S) + (+1) = (d)	32767→0→+1→+2→	32767→-32768→-32767	
	Operation result	(S) + (-1) = (d)	←-2←-1←-0←-32768	---	
	33-Bit	(S) + (+1) = (d)	2147483647→0→+1→+2→	2147483647→-2147483648→-2147483647	
	operation result	(S) + (-1) = (d)	←-2←-1←-0←-2147483648	---	

Error code

Error code	Content
4085H	The output results of (S1) and (S2) in the read application instruction exceed the device range
4086H	The output result of (D) in the write application instruction exceeds the device range

Example



Add 100000 to the data in (D1, D0), and store the result of the operation in (D3, D2), that is, (D1, D0) + 100000 → (D3, D2).

SUB/16-bit subtraction operation

SUB(P)

Subtract the BIN 16-bit data specified in (S1) and the BIN 16-bit data specified in (S2), and store the result in the device specified in (D).

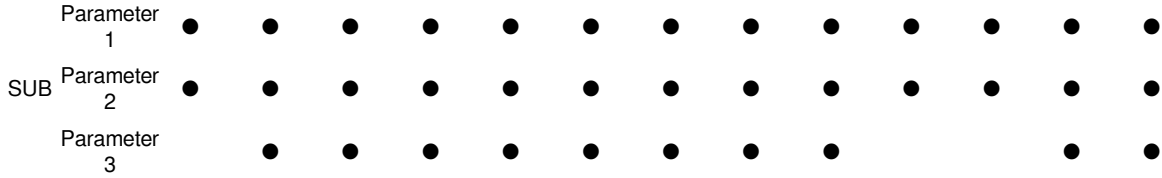
-[SUB (S1) (S2) (D)]

Content, range and data type

Parameter	Content	Range	Data type	Data type (label)
(S1)	The subtraction data or the device storing the subtraction data	-32768 to 32767	Signed BIN16	ANY16_S
(S2)	The subtraction data or the device storing the subtraction data	-32768 to 32767	Signed BIN16	ANY16_S
(D)	Device for storing calculation results		Signed BIN16	ANY16_S

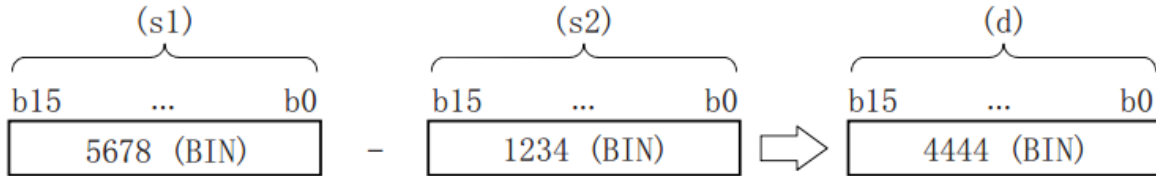
Device used

Instruction parameter	Devices											Offset modification [D]	Pulse extension XXP
	KnX	KnY	KnM	KnS	T	C	D	R	SD	K	H		



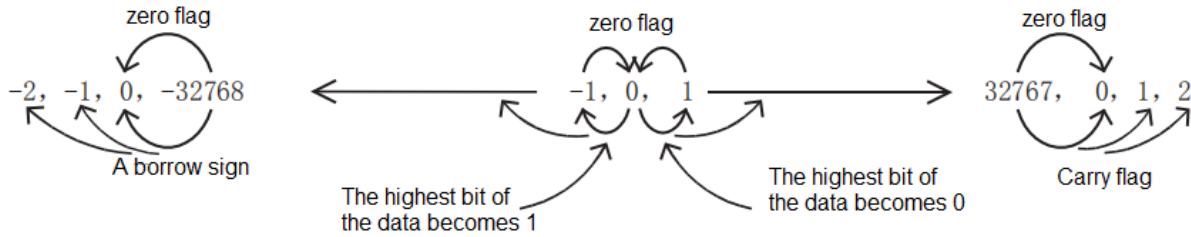
Features

Subtract the BIN 16-bit data specified in (S1) and the BIN 16-bit data specified in (S2), and store the result of the operation in the device specified in (D).



Related device nbsp;:

Devices	Name	Content
SM151	Carry	When the operation result exceeds 32,767, the carry flag will be (ON).
SM152	Borrow	When the operation result is less than -32,768, the borrow flag will be (ON).
SM153	Zero point	When the operation result is 0, the zero flag will be (ON).



#Note:

1. When the source operand and destination operand are specified as the same device:

The source operand and destination operand can also be specified as the same device number.

In this case, if continuous execution type instructions (SUB, DSUB) are used, the result of the subtraction operation will change every operation cycle. Please be careful.

2. The difference between the SUB(P) instruction and the -(P) instruction and DEC(P) instruction executed by the -1 subtraction program

SUB(P) instruction every time X1 changes from OFF to ON, the program of D0 content -1 is similar to -(P) instruction and DEC(P) instruction described later, but the following contents are different.

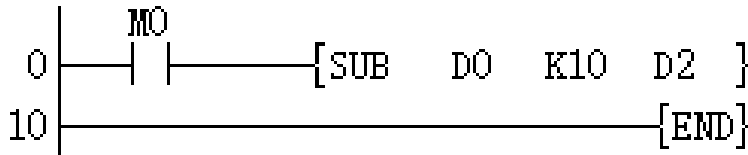
Flag bit (zero, borrow, carry)	SUB/SUBP/DSUB/DSUBP instructions	DEC/DECP/DDEC/DDECP instructions
Calculation result	16-bit operation result (S)-(+1)=(D)	No action
	←-2←-1←0←-32768	-32768→ +32767→32766

	(S)-(-1)=(D)	+32767→0→+1→+2→	---
	(S)-(+1)=(D)	←-2←-1←0←-2147483648→2147483647→2147483646	
32-bit operation result	(S)-(-1)=(D)	2147483647→0→	---
		+1→+2→	

Error code

Error code	Content
4085H	The output results of (S1) and (S2) in the read application instruction exceed the device range
4086H	The output result of (D) in the write application instruction exceeds the device range

Example



Subtract 10 from the data in D0, and store the calculation result in D2, that is, (D0)-10 → (D2).

DSUB/32-bit subtraction operation

DSUB(P)

Subtract the BIN32-bit data specified in (S1) and the BIN32-bit data specified in (S2), and store the result in the device specified in (D).

-[DSUB (S1) (S2) (D)]

Content, range and data type

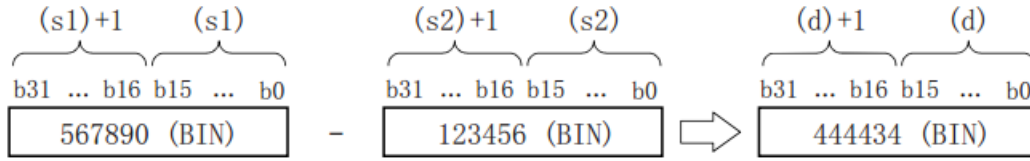
Parameter	Content	Range	Data type	Data type (label)
(S1)	The subtraction data or the device storing the subtraction data	-2147483648 to 2147483647	Signed BIN32	ANY32_S
(S2)	The subtraction data or the device storing the subtraction data	-2147483648 to 2147483647	Signed BIN32	ANY32_S
(D)	Device for storing calculation results		Signed BIN32	ANY32_S

Device used

Instruction	Parameter	Devices													Offset Pulse modification dimension	
		KnX	KnY	KnM	KnS	T	C	D	R	SD	LC	HSC	K	H	[D]	XXP
DSUB	Parameter 1	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
	Parameter 2	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
	Parameter 3		●	●	●	●	●	●	●	●	●	●		●	●	

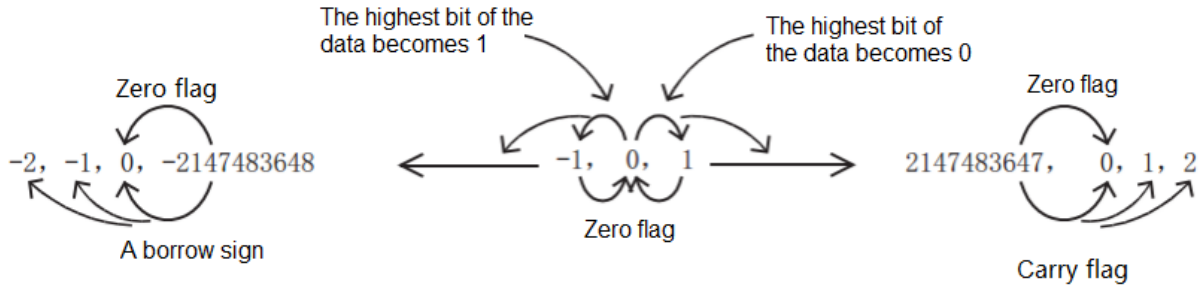
Features

Subtract the BIN32-bit data specified in (S1) and the BIN32-bit data specified in (S2), and store the result of the operation in the device specified in (D).



Related device

Devices	Name	Content
SM151	Carry	When the operation result exceeds 2,147,483,647, the carry flag will be ON.
SM152	Borrow	When the operation result is less than -2,147,483,648, the borrow flag will be ON.
SM153	Zero point	When the operation result is 0, the zero flag will be ON.



#Note:

1. When the source operand and destination operand are specified as the same device:

The source operand and destination operand can also be specified as the same device number.

In this case, if continuous execution type instructions (SUB, DSUB) are used, the result of the subtraction operation will change every operation cycle. Please be careful.

2. The difference between the SUB(P) instruction and the -(P) instruction and DEC(P) instruction executed by the -1 subtraction program

SUB(P) instruction every time X1 changes from OFF to ON, the program of D0 content -1 is similar to -(P) instruction and DEC(P) instruction described later, but the following contents are different.

Flag bit (zero, borrow, carry)		SUB/SUBP/DSUB/ DSUBP instructions	DEC/DECP/DDEC/ DDECP instructions
		Action	No action
16-bit operation result	(S)-(+1)=(D)	←-2←-1←0←-32768	-32768→32767→32766
	(S)-(-1)=(D)	+32767→0→+1→+2→	---
Calculation result	(S)-(+1)=(D)	←-2←-1←0←-2147483648	2147483647→2147483646
	(S)-(-1)=(D)	+2147483647→0→	---
32-bit operation result		+1→+2→	

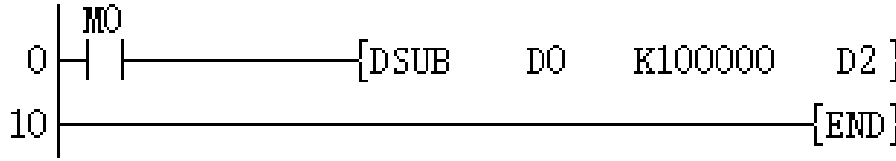
Error code

Error code	Content
4085H	The output results of (S1) and (S2) in the read application instruction exceed the device range

4086H

The output result of (D) in the write application instruction exceeds the device range

Example



Subtract 100000 from the data in (D1,D0), and store the result of the operation in (D3,D2), that is, (D1,D0)-10000 → (D3,D2).

MUL/16-bit multiplication

MUL(P)

Multiply the BIN16 bits specified in (S1) with the BIN16 bits specified in (S2), and store the result in the device specified in (D).

-[MUL (S1) (S2) (D)]

Content, range and data type

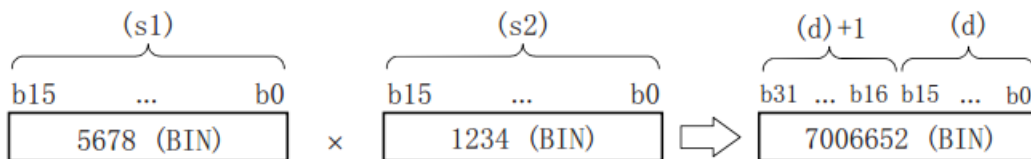
Parameter	Content	Range	Data type	Data type (label)
(S1)	Multiplication operation data or the device storing multiplication operation data	-32768 to 32767	Signed BIN 16 bit	ANY16_S
(S2)	Multiplication operation data or the device storing multiplication operation data	-32768 to 32767	Signed BIN 16 bit	ANY16_S
(D)	Device for storing calculation results		Signed BIN 32 bit	ANY32_S

Device used

InstrucParameter	Devices											Offset Pulse modification			
	KnX	KnY	KnM	KnS	T	C	D	R	SD	LC	HSC	K	H	[D]	XXP
Parameter 1	●	●	●	●	●	●	●	●	●			●	●	●	●
MUL Parameter 2	●	●	●	●	●	●	●	●	●			●	●	●	●
Parameter 3		●	●	●	●	●	●	●	●	●	●			●	●

Features

Multiply the BIN 16-bit data specified in (S1) with the BIN 16-bit data specified in (S2), and store the result of the operation in the device specified in (D).



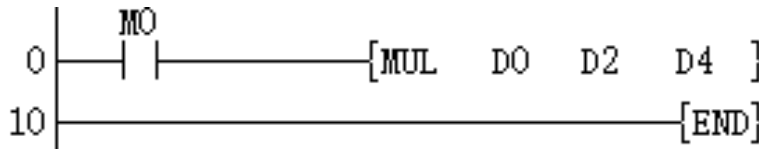
(D) is the multiplication result in the case of bit device

- K1: lower 4 bits (B0 to B3)
- K4: Lower 16 bits (B0 to B15)
- K8: Lower 32 bits (B0 to B31)

Error code

Error code	Content
4085H	The output results of (S1) and (S2) in the read application instruction exceed the device range
4086H	The output result of (D) in the write application instruction exceeds the device range

Example



Multiply the data in (D0) by (D2), and store the operation result in (D5, D4), that is, (D0) × (D2) → (D5, D4).

DMUL/32-bit multiplication

DMUL(P)

Multiply the 32-bit BIN specified in (S1) and the 32-bit BIN specified in (S2), and store the result in the device specified in (D).

-[DMUL (S1) (S2) (D)]

Content, range and data type

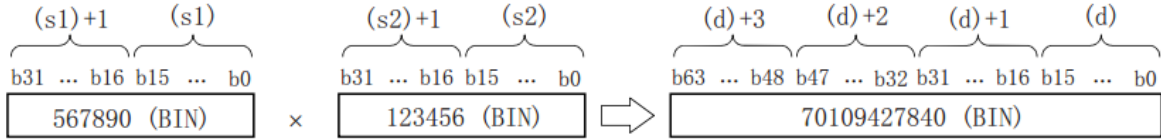
Parameter	Content	Range	Data type	Data type (label)
(S1)	Multiplication operation data or device storing multiplication operation data	-2147483648 to 2147483647	Signed BIN 32 bit	ANY32_S
(S2)	Multiplication operation data or device storing multiplication operation data	-2147483648 to 2147483647	Signed BIN 32 bit	ANY32_S
(D)	Device for storing calculation results		Signed BIN64 bit	ANY64_S

Device used

Instruction	Parameter	Devices											Offset modification		Pulse dimension	
		KnX	KnY	KnM	KnS	T	C	D	R	SD	LC	HSC	K	H		[D]
DMUL	Parameter 1	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
	Parameter 2	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
	Parameter 3		●	●	●	●	●	●	●	●	●	●		●	●	

Features

Multiply the BIN32-bit data specified in (S1) and the BIN32-bit data specified in (S2), and store the result of the operation in the device specified in (D).



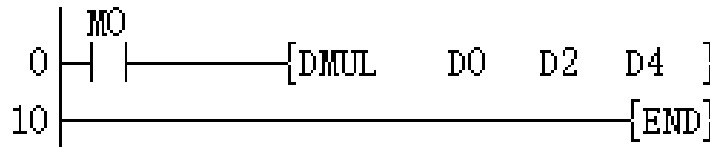
(D) is the multiplication result in the case of bit device

- K1: lower 4 bits (B0 to B3)
- K4: Lower 16 bits (B0 to B15)
- K8: Lower 32 bits (B0 to B31)

Error code

Error code	Content
4085H	The output results of (S1) and (S2) in the read application instruction exceed the device range
4086H	The output result of (D) in the write application instruction exceeds the device range

Example



Multiply the data in (D1, D0) by (D3, D2), and store the result of the operation in ((D7, D6), (D5, D4)), ie (D1, D0) × (D3, D2) → ((D7, D6), (D5, D4)).

DIV/16-bit division operation

DIV(P)

Divide the BIN 16-bit data specified in (S1) with the BIN 16-bit data specified in (S2), and store the result in the device specified in (D).

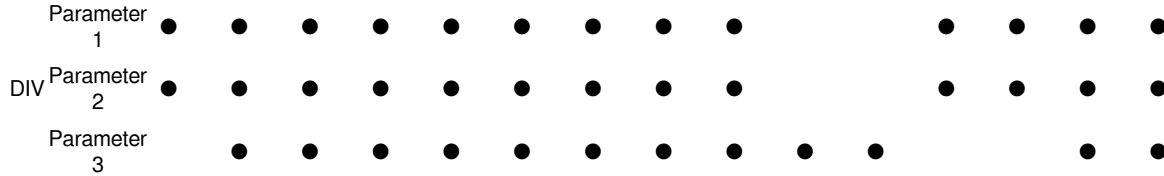
-[DIV (S1) (S2) (D)]

Content, range and data type

Parameter	Content	Range	Data type	Data type (label)
(S1)	Division operation data or device storing division operation data	-32768 to 32767	Signed BIN 16 bit	ANY16_S
(S2)	Division operation data or device storing division operation data	-32768 to 32767	Signed BIN 16 bit	ANY16_S
(D)	Device for storing calculation results		Signed BIN 32 bit	ANY32_S

Device used

Instruction Parameter	Devices													Offset modification		Pulse width
	KnX	KnY	KnM	KnS	T	C	D	R	SD	LC	HSC	K	H	[D]	XXP	



Features

Divide the BIN 16-bit data specified in (S1) with the BIN 16-bit data specified in (S2), and store the result of the operation in the device specified in (D).

In the case of a word device, the division result uses a 32-bit storage quotient and remainder, and in the case of a bit device, only a 16-bit storage quotient is used.

- Quotient is stored in the lower 16 bits.
- The remainder is stored in the upper 16 bits. (Can only be stored in the case of word devices.)

#Note

1. About the operation result

- The highest bit of the quotient and remainder represents the sign of positive (0) and negative (1).
- When one of (S1) or (S2) is negative, the quotient becomes negative. When (S1) is negative, the remainder becomes negative.

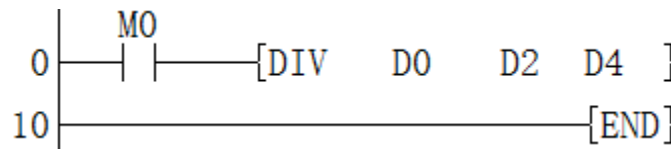
2. The device specified by (D)

- With the digit specification function, when specifying a bit device, the remainder cannot be obtained.

Error code

Error code	Content
4080H	The input of divisor (S2) is 0
4085H	The output results of (S1) and (S2) in the read application instruction exceed the device range
4086H	The output result of (D) in the write application instruction exceeds the device range

Example



Divide the data in (D0) by (D2), and store the result of the calculation: the quotient is stored in (D4), and the remainder is stored in (D5), ie (D0)/ (D2) → (D5(quotient)) (D4(remainder)).

DDIV/32-bit division operation

DDIV(P)

Divide the BIN32-bit data specified in (S1) with the BIN32-bit data specified in (S2), and store the result in the device specified in (D).

-[DDIV (S1) (S2) (D)]

Content, range and data type

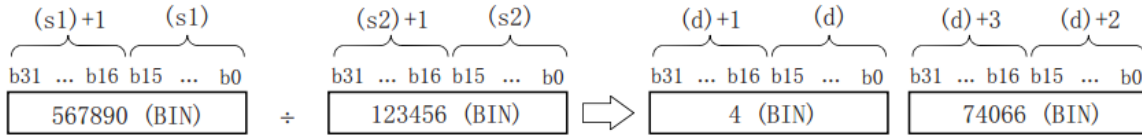
Parameter	Content	Range	Data type	Data type (label)
(S1)	Division operation data or device storing division operation data	-2147483648 to 2147483647	Signed BIN 32 bit	ANY32_S
(S2)	Division operation data or device storing division operation data	-2147483648 to 2147483647	Signed BIN 32 bit	ANY32_S
(D)	Device for storing calculation results		Signed BIN64 bit	ANY64_S

Device used

Instruction	Parameter	Devices											Offset modification		Pulse width	
		KnX	KnY	KnM	KnS	T	C	D	R	SD	LC	HSC	K	H		[D]
	Parameter 1	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
DDIV	Parameter 2	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
	Parameter 3		●	●	●	●	●	●	●	●	●	●		●	●	

Features

Divide the BIN32-bit data specified in (S1) with the BIN32-bit data specified in (S2), and store the result of the operation in the device specified in (D).



In the case of word devices, the division result uses BIN64 bits to store the quotient and remainder. In the case of bit devices, only the BIN 32-bit storage quotient is used.

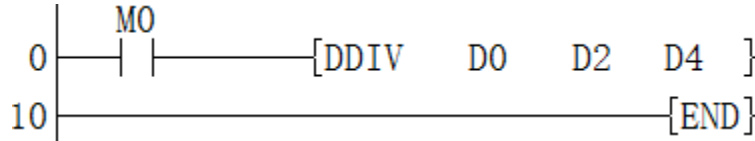
#Note:

- About the operation result
 - The highest bit of the quotient and remainder represents the sign of positive (0) and negative (1).
 - When one of (S1) or (S2) is negative, the quotient becomes negative. When (S1) is negative, the remainder becomes negative.
- The specified device of (D)
 - With the digit specification function, when a bit device is specified, the remainder cannot be obtained.

Error code

Error code	Content
4080H	The input of divisor (S2) is 0
4085H	The output results of (S1) and (S2) in the read application instruction exceed the device range
4086H	The output result of (D) in the write application instruction exceeds the device range

Example



Divide the data in (D1, D0) by (D3, D2), and store the result of the calculation: the quotient is stored in (D5, D4), and the remainder is stored in (D7, D6), that is (D1, D0)/ (D3, D2) → (D5, D4) (quotient) (D7, D6) (remainder).

INC/16-bit data increment

INC(P)

Add one to the device (BIN 16-bit data) specified in (D).

-[INC (D)]

Content, range and data type

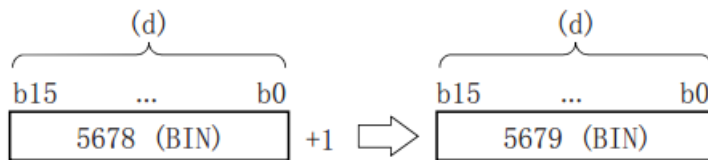
Parameter	Content	Range	Data type	Data type (label)
(D)	The word device number that stores the data added by one	-32768 to 32767	Signed BIN 16 bit	ANY16_S

Device used

Instruction	Parameter	Devices							Offset modification [D]	Pulse extension XXP
		KnY	KnM	KnS	T	C	D	R		
INC	Parameter 1	●	●	●	●	●	●	●	●	●

Features

Add one to the device (BIN 16-bit data) specified in (D).



- If the INC(P) instruction is executed when the content of the device specified in (D) is 32767, -32768 will be stored in the device specified in (D).

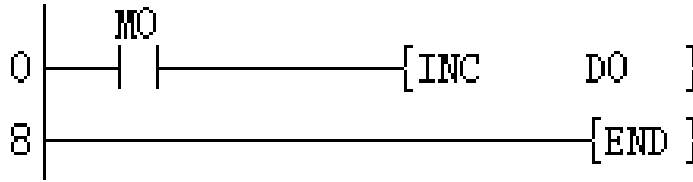
- Flags (zero, borrow, carry) do not perform actions.

#Note: If the continuous execution (INC) instruction is used, the addition operation will be performed every operation cycle, so care should be taken.

Error code

Error code	Content
4085H	The output results of (D) in the read application instruction exceed the device range
4086H	The output result of (D) in the write application instruction exceeds the device range

Example



Add one to the device value specified in D0, that is, (D0) + 1 → (D0).

DINC/32-bit data increment

DINC(P)

Add one to the device (BIN 32-bit data) specified in (D).

-[DINC (D)]

Content, range and data type

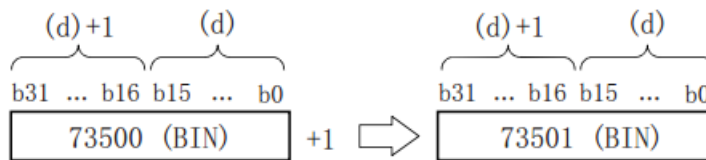
Parameter	Content	Range	Data type	Data type (label)
(D)	The word device number that stores the data added by one	-2147483648 to 2147493647	Signed BIN 32 bit	ANY32_S

Device used

Instruction	Parameter	Devices										Offset modification	Pulse extension
		KnY	KnM	KnS	T	C	D	R	SD	LC	HSC	[D]	XXP
DINC	Parameter 1	●	●	●	●	●	●	●	●	●	●	●	●

Features

Add one to the device (BIN 32-bit data) specified in (D).



- When the DINC(P) instruction is executed when the content of the device specified in (D) is 2147483647, -2147483648 will be stored in the device specified in (D).

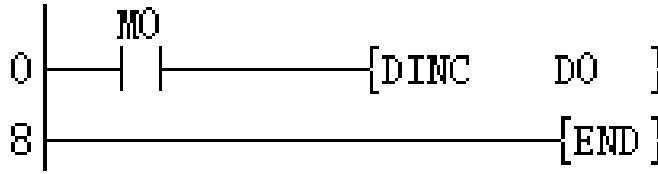
- Flags (zero, borrow, carry) do not perform actions.

#Note: If the continuous execution (INC) instruction is used, the addition operation will be performed every operation cycle, so care should be taken.

Error code

Error code	Content
4085H	The output results of (D) in the read application instruction exceed the device range
4086H	The output result of (D) in the write application instruction exceeds the device range

Example



Add one to the device value specified in (D1, D0), that is, $(D1, D0) + 1 \rightarrow (D1, D0)$.

DEC/16 bit data decrement

DEC(P)

Minus one for the device (BIN 16-bit data) specified in (D).

-[DEC (D)]

Content, range and data type

Parameter	Content	Range	Data type	Data type (label)
(D)	The word device number that stores the data minus by one	-32768 to 32767	Signed BIN 16 bit	ANY16_S

Device used

Instruction	Parameter	Devices							Offset modification	Pulse extension		
		KnY	KnM	KnS	T	C	D	R			SD	[D]
DEC	Parameter 1	●	●	●	●	●	●	●	●	●	●	●

Features

Minus one for the device (BIN 16-bit data) specified in (D).



- If the DEC(P) instruction is executed when the content of the device specified in (D) is -32768, 32767 will be stored in the device specified in (D).

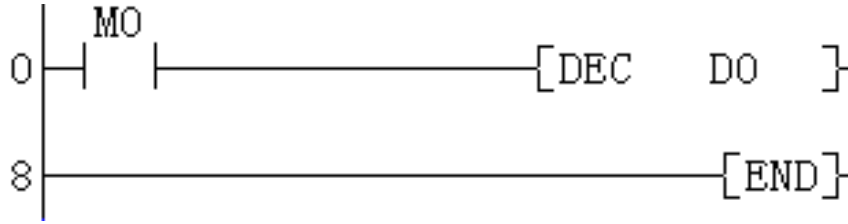
- Flags (zero, borrow, carry) do not perform actions.

#Note: If using continuous execution (DEC) instructions, subtraction will be performed every operation cycle, so care should be taken.

Error code

Error code	Content
4085H	The output results of (D) in the read application instruction exceed the device range
4086H	The output result of (D) in the write application instruction exceeds the device range

Example



Each time M0 is set, the value of the device specified in D0 will be -1, (D0)-1 → (D0).

DDEC/32-bit data decrement

DDEC(P)

Minus one for the device (BIN 32-bit data) specified in (D).

-[DDEC (D)]

Content, range and data type

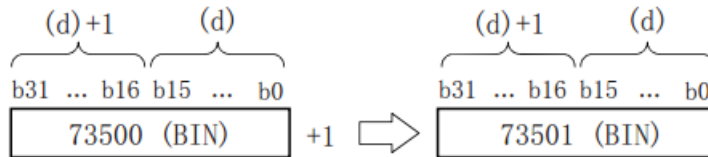
Parameter	Content	Range	Data type	Data type (label)
(D)	The word device number that stores the data minus by one	-2147483648 to 2147483647	Signed BIN 32 bit	ANY32_S

Device used

Instruction	Parameter	Devices										Offset modification	Pulse extension	
		KnY	KnM	KnS	T	C	D	R	SD	LC	HSC			[D]
DDEC	Parameter 1	●	●	●	●	●	●	●	●	●	●	●	●	●

Features

Minus one for the device (BIN 32-bit data) specified in (D).



If the DDEC(P) instruction is executed when the content of the device specified in (D) is 0, minus one will be stored in the device specified in (D).

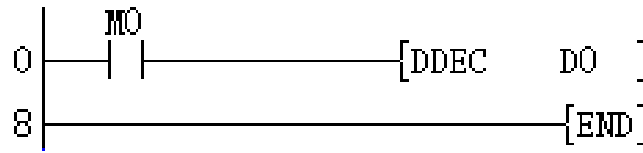
- Flags (zero, borrow, carry) do not perform actions.

#Note: If using continuous execution (DEC) instructions, subtraction will be performed every operation cycle.

Error code

Error code	Content
4085H	The output results of (D) in the read application instruction exceed the device range
4086H	The output result of (D) in the write application instruction exceeds the device range

Example



Minus one on the device value specified in (D1, D0), that is, (D1, D0)-1 → (D0).