07-5 Basic instruction

last modified by Joey on 2022/06/09 16:19

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Contact comparison instruction

Signed 16-bit contact comparison instruction

LD £, AND £, OR £

The BIN 16-bit data of the device specified in (s1) and the BIN 16-bit data of the device specified in (s2) are compared by normal open contact processing.

LD£: Normally open contact comparison instruction

AND£: Normally open contact series connection comparison instruction

OR£: Normally open contact parallel connection comparison instruction

Ladder diagram



(You can enter "=", "<>", ">", "<", ">=", "<=" in "£")

Content, range and data type

Parameter		Content		Rang	Range			type		Data	Data type (label)			
(s1) Comported c		Compa or dev compa	Comparison data or device storing comparison data		-3270	-32768 to 32767			Signed BIN 16 bit			ANY16_S		
(s2)		Comparison data or device storing comparison data			-32768 to 32767			Signe	Signed BIN 16 bit			ANY16_S		
Devi	ce use	d												
Instruc	t Ra ram	etteervice	es										Offse modi	t Pulse ficaetxiotemsion
		KnX	KnY	KnM	KnS	т	С	D	R	SD	к	н	[D]	ХХР
LD=	s1, s2	•	•	•	•	•	•	•	•	•	•	•	•	
LD>	s1, s2	•	•	•	•	•	•	•	•	•	•	•	•	
LD<	s1, s2	•	•	•	•	•	•	•	•	•	•	•	•	
LD>=	s1, s2	•	•	•	•	•	•	•	•	•	•	•	•	

LD<=	s1, s2	•	•	•	•	•	•	•	•	•	•	•	•
LD<>	s1, s2	•	•	•	•	•	•	•	•	•	•	•	•
AND=	s1, s2	•	•	•	•	•	•	•	•	•	•	•	•
AND>	s1, s2	•	•	•	•	•	•	•	•	•	•	•	•
AND<	s1, s2	•	•	•	•	•	•	•	•	•	•	•	•
AND>=	s1, s2	•	•	•	•	•	•	•	•	•	•	•	•
AND<=	s1, s2	•	•	•	•	•	•	•	•	•	•	•	•
AND<>	s1, s2	•	•	•	•	•	•	•	•	•	•	•	•
OR=	s1, s2	•	•	•	•	•	•	•	•	•	•	•	•
OR>	s1, s2	•	•	•	•	•	•	•	•	•	•	•	•
OR<	s1, s2	•	•	•	•	•	•	•	•	•	•	•	•
OR>=	s1, s2	•	•	•	•	•	•	•	•	•	•	•	•
OR<=	s1, s2	•	•	•	•	•	•	•	•	•	•	•	•
OR<>	s1, s2	•	•	•	•	•	•	•	•	•	•	•	•

Features

The BIN 16-bit data of the device specified in (s1) and the BIN 16-bit data of the device specified in (s2) are compared by normal open contact processing.

The comparison operation result of each instruction is shown below.

Instruction Sign	Condition	Comparison operation result	Instruction Sign	Condition	Comparison operation result
=	(s1)=(s2)	On state	=	(s1)≠(s2)	Non-conduction
<>	(s1)≠(s2)		\diamond	(s1)=(s2)	state
>	(s1)>(s2)		>	(s1)≤(s2)	
<	(s1)<(s2)		<	(s1)≥(s2)	
>=	(s1)≥(s2)		>=	(s1)<(s2)	
<=	(s1)≤(s2)		<=	(s1)>(s2)	

Error code

Error code

4085H

Content

(s) read address exceeds the device range

Example

(1) LD£ instruction:



When the current value of counter C10 is 200, Y10 is set

When the content of D200 is above -29, and X1 is ON, Y11 is set

(2) AND£ instruction:



When X0 is ON, or when the current value of counter C10 is 200, Y10 is set When X1 is OFF, and the content of data counter D0 is not -10, Y11 is set

(3) OR£ instruction:



When X1 is ON, or when the current value of counter C10 is 200, Y0 is set

When X2 and M30 are ON, or the content of register D100 is K10000 and above, M60 is set

Signed 32-bit contact comparison instruction

LDD £, ANDD £, ORD £

The BIN 32-bit data of the device specified in (s1) and the BIN 32-bit data of the device specified in (s2) are compared by normal open contact processing.

LDD£: Normally open contact comparison command

ANDD£: Normally open contact series link comparison instruction

ORD£: Normally open contact parallel link comparison instruction

Ladder diagram



"=", "<>", ">", "<", ">=", "<=" can be input in "£"

Content, range and data type

Parameter	Content	Range	Data type	Data type (label)
(s1)	Comparison data or device storing comparison data	-2147483648 to 2147483647	Signed BIN 32 bit	ANY32_S
(s2)	Comparison data or device storing comparison data	-2147483648 to 2147483647	Signed BIN 32 bit	ANY32_S

Device used

Instruc Flør am	struc flor am@devices											Offse mod	et Pulse ifiœettension		
	KnX	KnY	KnM	KnS	т	С	D	R	SD	LC	HSC	к	н	[D]	XXP
LDD= s1, s2	•	•	•	•	•	•	•	•	•	•	•	•	•	•	
LDD> s1, s2	•	•	•	•	•	•	•	•	۲	•	•	•	•	۲	
LDD< s1, s2	•	•	•	•	•	•	•	•	٠	•	•	•	•	٠	
LDD>=s1, s2	•	•	•	•	•	•	•	•	٠	•	•	•	•	٠	
LDD<=s1, s2	•	•	•	•	•	•	•	•	۲	•	•	•	•	۲	
LDD<>s1, s2	•	•	•	•	•	•	•	•	۲	•	•	•	•	۲	
ANDD=s1, s2	•	•	•	•	•	•	•	•	۲	•	•	•	•	۲	
ANDD>s1, s2	•	•	•	•	•	•	•	•	۲	•	•	•	•	۲	
ANDD <s1, s2<="" td=""><td>•</td><td>•</td><td>•</td><td>•</td><td>•</td><td>•</td><td>•</td><td>•</td><td>٠</td><td>•</td><td>•</td><td>•</td><td>•</td><td>٠</td><td></td></s1,>	•	•	•	•	•	•	•	•	٠	•	•	•	•	٠	
ANDD> s -1, s2	•	•	•	•	•	•	•	•	٠	•	•	•	•	٠	
ANDD ⊲s -1, s2	•	•	•	•	•	•	•	•	۲	•	•	•	•	۲	
ANDD ⊲s 1, s2	•	•	•	•	•	•	•	•	۲	•	•	•	•	۲	
ORD= s1, s2	•	•	•	•	•	•	•	•	۲	•	•	•	•	۲	
ORD> s1, s2	•	•	•	•	•	•	•	•	٠	•	•	•	•	۲	
ORD< s1, s2	•	•	•	•	•	•	•	•	٠	•	•	•	•	٠	
ORD>=s1, s2	•	•	•	•	•	•	•	•	٠	•	•	•	•	•	

ORD<=s1, s2 ●	•	•	•	•	•	•	•	•	•	•	•	•	•
ORD<>s1, s2 ●	•	•	•	•	•	•	•	•	•	•	•	•	•

Features

The BIN 32-bit data of the device specified in (s1) and the BIN 32-bit data of the device specified in (s2) are compared by normal open contact processing.

The comparison operation result of each instruction is shown below.

Instruction Sign	Condition	Comparison operation result	Instruction Sign	Condition	Comparison operation result
=	(s1)=(s2)	On state	=	(s1)≠(s2)	Non-conduction
<>	(s1)≠(s2)		<>	(s1)=(s2)	state
>	(s1)>(s2)		>	(s1)≤(s2)	
<	(s1)<(s2)		<	(s1)≥(s2)	
>=	(s1)≥(s2)		>=	(s1)<(s2)	
<=	(s1)≤(s2)		<=	(s1)>(s2)	

Error code

Error code

4085H

Content (S) read address exceeds the device range

Example

(1) LDD£ instruction:



When the data of LC10 is 200000, Y10 is set, otherwise Y10 is reset.

When the 32-bit data composed of D201 and D200 exceeds -5000, and X1 is ON, Y11 is turned ON. (2) ANDD£ instruction:



When X0 is ON and the value of LC10 is 200000, Y10 is set, otherwise it is reset.

When X1 is OFF and the 32-bit data composed of D1 and D0 is not equal to K-50000, Y11 is set. (3) ORD£ instruction:



When X1 is ON, or the data of LC10 is equal to the data of LC10 is equal to 200000, Y0 is set.

When X2 and M30 are set, or the double word data composed of D101 and D100 is greater than or equal to 100000, M60 is set.

Single precision real number contact comparison instruction

LDE £, ANDE £, ORE £

The single precision real number of the device specified in (s1) and the single precision real number of the device specified in (s2) are compared by normal open contact processing.

LDE£: Normally open contact comparison command

ANDE£: Normally open contact series link comparison instruction

ORE£: Normally open contact parallel link comparison instruction

Ladder diagram



(□输入=、<>、>、<=、<、>=。)

"=", "<>", ">", "<", ">=", "<=" can be input in "£"

Content, range and data type

Parameter	Content	Range	Data type	Data type (label)
(s1)	Comparison data or the device start number storing the comparison data	0, 2 ⁻¹²⁶ ≤ (s) < 2 ¹²⁸	Single precision real number	ANYREAL_32
(s2)	Comparison data or the device start number storing the comparison data	0, 2 ⁻¹²⁶ ≤ (s) < 2 ¹²⁸	Single precision real number	ANYREAL_32

Offset

Pulse

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Device used

Instructio Paramete Devices

monucu	onaranic									modifi	catiextension
		т	С	D	R	SD	LC	HSC	Е	[D]	XXP
LDE=	s1, s2	•	•	•	•	•	•	•	•	•	
LDE>	s1, s2	•	•	•	•	•	•	•	•	•	
LDE<	s1, s2	•	•	•	•	•	•	•	•	•	
LDE>=	s1, s2	•	•	•	•	•	•	•	•	•	
LDE<=	s1, s2	•	•	•	•	•	•	•	•	•	
LDE<>	s1, s2	•	•	•	•	•	•	•	•	•	
ANDE=	s1, s2	•	•	•	•	•	•	•	•	•	
ANDE>	s1, s2	•	•	•	•	•	•	•	•	•	
ANDE<	s1, s2	•	•	•	•	•	•	•	•	•	
ANDE>=	s1, s2	•	•	•	•	•	•	•	•	•	
ANDE<=	s1, s2	•	•	•	•	•	•	•	•	•	
ANDE<>	s1, s2	•	•	•	•	•	•	•	•	•	
ORE=	s1, s2	•	•	•	•	•	•	•	•	•	
ORD>	s1, s2	•	•	•	•	•	•	•	•	•	
ORE<	s1, s2	•	•	•	•	•	•	•	•	•	
ORE>=	s1, s2	•	•	•	•	•	•	•	•	•	
ORE<=	s1, s2	•	•	•	•	•	•	•	•	•	
ORE<>	s1, s2	•	•	•	•	•	•	•	•	•	

Features

The single precision real number of the device specified in (s1) and the single precision real number of the device specified in (s2) are compared by normal open contact processing.

The comparison operation result of each instruction is shown below.

Instruction Sign	Condition	Comparison operation result	Instruction Sign	Condition	Comparison operation result
E=	(s1)=(s2)	On state	E=	(s1)≠(s2)	Non-conduction
E<>	(s1)≠(s2)		E<>	(s1)=(s2)	state
E>	(s1)>(s2)		E>	(s1)≤(s2)	
E<	(s1)<(s2)		E<	(s1)≥(s2)	
E>=	(s1)≥(s2)		E>=	(s1)<(s2)	
E<=	(s1)≤(s2)		E<=	(s1)>(s2)	
Error code					
Error code			Content		

When the content of the specified device by (s1) and (s2) is an irregular number, a non-number, or $\pm \infty$ 4085H The read address of (s1) and (s2exceeds the device range Example (1) LDE£ instruction:



When the real number input in D0 is equal to E1.23, Y10 is ON, otherwise Y10 is OFF.

When the real number in R0 is greater than or equal to the real number in LC0, Y11 is ON, otherwise it is OFF.

If the input in D0, R0, LC0 is not a real number, it will report H4084 error.

(2) ANDE£ instruction:

$$20 \xrightarrow{MO} [E <> E1. 23 D2] [E < R2 LC2] (Y12)$$

Only when M0 is ON and D2 real number is not equal to E1.23 and R2 real number is less than real number LC2, Y12 is ON, otherwise all are OFF.

(3) ORE£ instruction:



When the real number of R4 is less than or equal to the real number of R15, or the real number R6 is equal to the real number R20, Y13 is ON, otherwise Y13 is OFF.

String comparison

LDS£ \ ANDS£ \ ORS£

Compare the string stored after the device number specified in (s1) with the string stored after the device number specified in (s2).

LDS£: String comparison instruction

ANDS£: String serial connection comparison instruction

ORS£: String parallel connection comparison instruction

Ladder diagram

4084H



```
"=" and "<>" could be entered in "£"
```

Content, range and data type

Parameter 0		Content Range					Date ty	ре	Date type(label)				
(S1) Co de sto stri			Connectior levice star storing the string spec	n data or th t number data or the ified direct	ne - e tly	-				A	ANYSTRING_SINGLE		
(S1)		() c s s	Connectior levice star storing the string spec	n data or th t number data or the ified direct	ne - e tly			String		A	NYSTRIN	G_SINGLE	
Devic	e used												
Instructi	ionarame	teDevice	es								Offset modif	t Pulse ica text ension	
		KnX	KnY	KnM	KnS	т	С	D	R	SD	[D]	ХХР	
LDS=	s1 ` s2	•	•	•	•	٠	•	•	•	•	•		
LDS<>	s1 ` s2	•	•	•	•	٠	•	•	•	•	•		
ANDS=	s1 ` s2	•	•	•	•	٠	•	•	•	•	•		
ANDS<>	s1 ` s2	•	•	•	•	٠	•	•	•	•	•		
ORS=	s1 ` s2	•	•	•	•	٠	•	•	•	•	•		
ORS<>	s1 • s2	•	•	•	•	•	•	•	•	•	•		

Features

• Compare the string stored after the device number specified in (s1) with the string stored after the device number specified in (s2).

• The comparison operation result of each instruction is shown below.

Instruction sign	Condition	Comparison operation result	Instruction sign	Condition	Comparison operation result	
=	(s1) = (s2)	On stat	=	(s1)≠(s2)	Non-conduction	
<>	(s1)≠(s2)		<>	(s1)=(s2)	state	
Error code						

Content

The read address of (s1) or (s2) exceeds the device range

device is read but 00H is not found as the end.

The length of the read string of (s1) or (s2) exceeds, and the continuous length of the string exceeds 400 characters.

When (s1) or (s2) reading the string, the maximum range of the

Error code	
4085H	
408AH	

408BH

Example

(1) LDS£ instruction:



(2) ANDS£ instruction:



(3) ORS£ instruction:



Clock operation instruction

TADD/The addition of clock data

TADD(P)

Add the time data stored after the device number specified in (s1) and the time data stored after the device number specified in (s2), and store the result of the addition operation after the device number specified in (d).

-[TADD (s1) (s2) (d)]

Content, range and data type									
Parameter	Content	Range	Data type	Data type (label)					

(s1)		The device start	number -		S	igned BIN 16	6 bit	ANY16_ARRAY			
	1	that stores the ac time data	ded					(number 3)	of elements:		
(s2)	-	The device start	number -		S	igned BIN 16	3 bit	ANY16_AP	RAY		
	1	that stores the ac operation time (ti data	ddition me)					(number of elements: 3)			
(d)	-	The device start	number -	Signed BIN 16 bit				ANY16_ARRAY			
that stores the time (time) data of the addition operation result								(number of elements: 3)			
Device us	sed										
Instruction	Parameter	Devices					Of m	fset odification	Pulse extension		
		т	С	D	R	SD	[D	۱	ХХР		
TADD	Parameter 1	1 ●	•	•	•	•	•		•		
	Parameter 2	2 •	•	•	•	•	•		•		
	Parameter 3	3 🔴	•	•	•	•	•		•		

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Features

Add the time data specified in (s1) and the time data specified in (s2), and store the result of the addition in the device number specified in (d) or later.



Example

When 6:32:40 and 7:48:10 are added together



When the calculation result time exceeds 24 o'clock, the carry flag turns ON, and the value after 24 hours is subtracted becomes the calculation result. For example, when 14:20:30 and 20:20:20 are added, the result is not 34:40:50, but 10:40:50.



When the calculation result is 0 (0 hour, 0 minute, 0 second), the zero flag turns on.

When 23:59:59 and 1 second are added, the result of the calculation is 0:00:00, and the carry flag and zero flag are turned on.

Related device are as follows:

Devices	Name	Content
SM151	Carry	It is ON when the result of the TADD(P) instruction exceeds the maximum clock data value of 23:59:59
SM153	Zero	It is ON when the result of the TADD(P) instruction is 0:00:00

#Note:

The devices specified in (s1), (s2), (d) occupy 3 points respectively. Be careful not to overlap with the device used for machine control.

When using the clock data time (hour, minute, second) of the built-in real-time clock of the CPU module, use the TRD(P) instruction to read the value of the special register and assign the word device to each operand.

Error code

Error code	Content
4085H	When reading the specified device range exceeds the corresponding device range
4086H	When writing the specified device range exceeds the corresponding device range
4084H	When the values specified in (s1) and (s2) are other than 0 to

When the values specified in (s1) and (s2) are other than 0 to 23 $\,$

When the values specified in (s1)+1, (s2)+1, (s1)+2 and (s2)+2 are other than 0 to 59

Example

MO				
TADD	D0	D10	D20]

Set D0 time to 16:30:00 and D10 time to 4:30:0

DO	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	16
D1	0	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	30
D2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
D10	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	4
D11	0	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	30
D12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

After the coil is turned on, the D20 time is 21:0:0

D20	1	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	21
D21	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
D22	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

TSUB/The subtraction of clock data

TSUB(P)

Subtract the time data stored after the device number specified in (s1) and the time data stored after the device number specified in (s2), and store the subtraction result in the device number specified in (d) or later .

-[TSUB (s1) (s2) (d)]

Content, range and data type									
Parameter	Content	Range	Data type	Data type (label)					

(s1)		he device start	-			Signed BIN 1	6 bit	ANY16_ARRAY			
	S	ubtracted time	data					(number of elements: 3)			
(s2)	Т	he device start	-			Signed BIN 1	6 bit	ANY16_A	RAY		
	n s ti	subtraction oper ime (time) data	es the ation					(number of eleme 3)			
(d)	Т	he device start	number -			Signed BIN 1	6 bit	ANY16_A	RRAY		
	ti († S	hat stores the ti time) data of the subtraction resu	me e It					(number 3)	of elements:		
Device us	sed										
Instruction	Parameter	Devices					O m	ffset odification	Pulse extension		
		т	С	D	R	SD	נ)]	ХХР		
TSUB	Parameter 1	•	•	•	•	•	•	1	•		
	Parameter 2	•	•	•	•	•	•	1	•		
	Parameter 3	•	•	•	•	•	•)	•		

Features

Subtract the time data specified in (s1) and the time data specified in (s2), and store the subtraction result in the device number specified in (d) or later.



Example

When subtracting 10:40:20 and 3:50:10

(s1)	10	
(s1)+1	40	
(s1)+2	20	

(s2)	3	
(s2)+1	50	
(s2)+2	10	

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

I)	6
l)+1	50
1)+2	10

When the calculation result time is a negative number, the borrow flag turns on and the data +24 is the calculation result. For example, in the case of subtracting 4:50:32 and 10:42:12, the result is not -6:8:20, but 18:8:20.

(s1)	4
(s1)+1	50
(s1)+2	32

(s2)	10	
(s2)+1	42	
(s2)+2	12	

(d)	18
(d)+1	8
(d)+2	20

When the calculation result is 0 (0 hour, 0 minute, 0 second), the zero flag turns on.

Related device are as follows:

Devices	Name	Content
SM152	Borrow	It is ON when the result of the $\ensuremath{TSUB}(\ensuremath{P})$ instruction is less than 0:00:00
SM153	Zero	It is ON when the result of the TSUB(P) instruction is at the time of $0{:}00{:}00{:}00{:}00{:}00{:}00{:}00{:}$

#Note:

• The devices specified in (s1), (s2), and (d) occupy 3 points respectively. Be careful not to overlap with the device used for machine control.

• When using the clock data time (hour, minute, second) of the built-in real-time clock of the CPU module, use the TRD(P) instruction to read the value of the special register and assign the word device to each operand.

Error code

4085H

4086H

4084H

Content When reading the specified device range exceeds the corresponding device range When writing the specified device range exceeds the corresponding device range

When the values specified in (s1) and (s2) are other than 0 to 23 $\,$

When the values specified in (s1)+1, (s2)+1, (s1)+2 and (s2)+2 are other than 0 to 59

Example



Set D0 time to 16:30:00 and D10 time to 4:30:0

DO	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	16
D1	0	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	30
D2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
D10	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	4
D11	0	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	30
D12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

After the coil is turned on, the D20 time is 12:00:00

D20	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	12
D21	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
D22	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

TRD/Clock data reading

TRD(P)

Read the clock data of the built-in real-time clock of the CPU module.

-[TRD (d)]

Content, range and data type

Parameter	eter Content			Range		Data type	Data ty	Data type (label)		
(d) Read start c clock Device used		ad destinat	ion and	-		Signed BIN 16 b	it ANY16_	ARRAY		
		rt device ni ck data	device number of data				(numk 7)	per of elements:		
Instruction	Parameter	eter Devices					Offset modification	Pulse extension		
		т	С		D	R	[D]	ХХР		

TOD	B	-	-	•	-	•	-
IRD	Parameter 1	•	•	•	•	•	•

Features

Read the clock data (SD100 to SD106) of the real-time clock built into the CPU module into (d) to (d)+6 in the following format.

Parameter	Element	Project	Clock data		Element	Project
Special register	SD105	Year (Gregorian)	2000 to 2099	\rightarrow	(d)	Year (Gregorian)
	SD104	Month	1 to 12	\rightarrow	(d)+1	Month
	SD103	Day	1 to 31	\rightarrow	(d)+2	Day
	SD102	Hour	0 to 23	\rightarrow	(d)+3	Hour
	SD101	Minute	0 to 59	\rightarrow	(d)+4	Minute
	SD100	Seconds	0 to 59	\rightarrow	(d)+5	Seconds
	SD106	Week	0 (Sun) to 6 (Sat)	\rightarrow	(d)+6	Week

• The related devices are shown below. The clock data of these special registers are updated through END processing.

Devices	Content
SD100	The second data of the clock data is stored in BIN code.
SD101	The sub-data of the clock data is stored in BIN code.
SD102	Time data of clock data is stored in BIN code.
SD103	The daily data of the clock data is stored in BIN code.
SD104	The monthly data of the clock data is stored in BIN code.
SD105	The year data of the clock data is stored in a 4-digit BIN code of the Gregorian calendar.
SD106	The week data of the clock data is stored in BIN code. (0: day, 1: one,, 6: six) are stored in BIN code.

#Note:

• The device specified in (d) occupies 7 points. Be careful not to overlap with the device used for machine control.

Error code

Error code	Content
4086H	When reading the specified device range exceeds the corresponding device range

Example



After the M0 coil is turned on, the current date and time are read as 2020-2-19 13:10:38 Wednesday

Device	+0	+1	+2	+3	+4	+5	+6
DO	2020	2	19	13	10	38	3

TWR/Clock data writing

TWR(P)

Write the clock data of the built-in real-time clock of the CPU module.

-[TWR (s)]

Content, range and data type

Parameter	Coi	ntent		Range		Data type		Data ty	oe (label)
(S)	Clostar	ck data write s t device numb	source, per	-		Signed BIN 1	6 bit	ANY16_ (number	ARRAY of elements: 7)
Device use	ed								
Instruction	Parameter	Devices					Of me	fset odification	Pulse extension
		т	С		D	R	[D]	ХХР
TWR	Parameter 1	•	•		•	•	•		•

Features

Write the set clock data (s) to (s)+6 to the clock data (SD100 to SD106) of the real-time clock built into the CPU module.

Set data at all time	s		Special register		
Element	Project	Clock data		Element	Project
(s)	Year (Gregorian)	2000 to 2099 or 0 to 99	\rightarrow	SD105	Year (Gregorian)
(s)+1	Month	1 to 12	\rightarrow	SD104	Month
(s)+2	Day	1 to 31	\rightarrow	SD103	Day
(s)+3	Hour	0 to 23	\rightarrow	SD102	Hour
(s)+4	Minute	0 to 59	\rightarrow	SD101	Minute
(s)+5	Seconds	0 to 59	\rightarrow	SD100	Seconds
(s)+6	Week	0 (Sun) to 6 (Sat)	\rightarrow	SD106	Week

• If the TWR(P) instruction is executed, the clock data of the real-time clock is changed immediately. Therefore, the clock data after a few minutes should be transferred to the set clock data (s) to (s)+6 in advance, and the instruction will be executed when the correct time is reached.

• If the year in (s) is in the range of 0 to 99, it will be automatically treated as 2000 to 2099.

• When a value indicating an impossible time is set, the clock data will not be updated. Set the correct clock data and write again.

- The day of the week (SD100) is automatically corrected.
- The related devices are shown below.

Devices	Content
SD100	The second data of the clock data is stored in BIN code.
SD101	The sub-data of the clock data is stored in BIN code.
SD102	Time data of clock data is stored in BIN code.
SD103	The daily data of the clock data is stored in BIN code.
SD104	The monthly data of the clock data is stored in BIN code.
SD105	The year data of the clock data is stored in a 4-digit BIN code of the Gregorian calendar.
SD106	The week data of the clock data is stored in BIN code. (0: day, 1: one,, 6: six) are stored in BIN code.
#Note:	

The device specified in (s) occupies 7 points. Be careful not to overlap with the device used for machine control.

Content

Error code

Error code

4085H

When reading the specified device range exceeds the corresponding device range

Example

Set D0 date and time to 2020-2-19 12:36:00 in advance



At the moment when the time 12:36:00 arrives, turn on the M0 coil and write the time.

Device	+0	+1	+2	+3	+4	+5	+6
DO	2020	2	19	12	36	0	0

HTOS/16-bit data conversion of time data (hour, minute, second \rightarrow second)

HTOS(P)

Convert the time data stored after the device number specified in (s) into seconds and store the conversion result as BIN 16-bit data in the device specified in (d).

-[HTOS (s) (d)]

Content, range and data type

Paramet	Parameter Content F		Ran	ge		Data ty	ре	Da	ata type (l	abel)			
(s) The device start number that stores the data of the subtracted time		The device start number - that stores the data of the subtracted time		The device star that stores the the subtracted		ber - f			Signed	BIN 16 bit	AN (ni	NY16_ARF umber of e	RAY lements: 3)
(d)		The device number tha converted o	start It stores th clock data	- Ie			Signed	BIN 16 bit	٩A	NY16			
Devic	e used												
Instructi	offarameteDevi	ces								Offset modifi	Pulse catiention		
	KnX	KnY	KnM	KnS	т	С	D	R	SD	[D]	XXP		
HTOS	Paramete ● 1	•	•	•	•	•	•	•	•	•	•		
	Parameter 2	٠	•	•	•	٠	•	٠	•	•	•		

Features

Convert the time data stored after the device number specified in (s) into seconds and store the conversion result in the device specified in (d).





Example

When 4 hours, 29 minutes and 31 seconds are specified in (s)



Error code

 Error code
 Content

 4085H
 When reading the specified device range exceeds the corresponding device range

 4086H
 When writing the specified device range exceeds the corresponding device range

 4084H
 When the calculation result is not in the range of 0 to 32767

 When the value specified in (s) is not in the range of 0 to 9

 When the value specified in (s)+1 and (s)+2 is not in the range of 0 to 59

 Example



DHTOS/32-bit data conversion of time data (hour, minute, second \rightarrow second)

DHTOS(P)

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Convert the time data stored after the device number specified in (s) into seconds and store the conversion result as BIN 32-bit data in the device specified in (d).

-[DHTOS (s) (d)]

Content, range and data type

Paramet	ter	Content		Ran	ge		Data ty	ре	Da	ata type (la	ibel)	
(S)	s) The device start number that stores the data of the subtracted time		The device s that stores th the subtracte		ıber - ıf			Signed	BIN 16 bit	Af (n	NY16_ARR umber of el	AY ements: 3)
(d)		The device number that converted o	e start at stores th clock data	-			Signed	BIN 32 bit	1A	NY32		
Devic	e used											
Instruct	idharamet@evi	ces								Offset modifie	Pulse cateoutension	
	KnX	KnY	KnM	KnS	т	С	D	R	SD	[D]	XXP	
DHTOS	Paramete● 1	•	•	•	•	•	•	•	•	•	•	
	Parameter 2	•	•	•	•	•	•	•	•	•	•	

Features

Convert the time data stored after the device number specified in (s) into seconds and store the conversion result in the device specified in (d).



Example

When 35 hours, 10 minutes and 58 seconds are specified in (s)



When the value specified in (s)+1 and (s)+2 is not in the range of 0 to 59 $\,$

Example

0 MO [DHTOS DO D10]

D0 time is set to 15:33:24

Device	+0	+1	+2
DO	15	33	24

The second of D10 after the M0 coil is turned on is

Device	+0	+1
DO	2162703	24
D8	0	56004

HOUR/Hour measuring 16-bit

HOUR(P)

The time for the input contact to be ON is measured in units of one hour.C

-[HOUR (s) (d1) (d2)]

Content, range and data type

Para	Parameter Content					Ra	ange				Data type					Data type (label)			
(s)			Th ala	e time rm (d2	when t) is tur	the ned O	KC N) to K3	2767			Signe	d BIN	16 bit		ANY	16		
			(set by	one ho	our)													
(d1)			De the me dat fail	vice the currer asurer a regis ure ret	at stor nt valu nent (s ster for ention	es e of specifie power)	- ed r					Unsig	ned Bl	N 16 b	it	ANY (N 2)	16_AF umber	RAY of eler	nents:
(d2)			De wh exp	vice th en the pires (a	at turn time li ılarm c	s ON mit output)	-					Bit				ANY	_воо	L	
De	vice used	I																	
Instr	u letairemDete i	ices																Offs mod	elPulse lifecateiosion
	Y	М	S	SM	D.b	KnX	KnY	KnM	KnS	т	С	D	R	SD	к	н	Е	[D]	ХХР
HOU	Parameter					•	•	•	•	•	•	•	•	•	•	•		•	•
	Parameter 2											•	•	•				•	•
	Parameter 3	•	•	•	•													•	•
_	-																		

Features

The input contact ON time is measured in units of 1 hour. When the cumulative ON time exceeds the time (BIN 16-bit data) specified in (s), the device specified in (d2) is turned on .

- In (s), set the time until the alarm (d2) turns ON in units of 1 hour.
- (d1) stores the current measured value in units of 1 hour.
- If the median value of (d1) exceeds 32767, it will be modified to 32767.
- (d1)+1 stores the current measured value (in units of 1 second) that is less than 1 hour.
- (d2) turns on when the current value (d1) exceeds the time specified in (s).

• In order to continue to use the current value data even after the power of the CPU module is turned off, specify the data register for power failure retention to (d1). If you use general-purpose data registers, the current value data will be cleared by powering off the CPU module and STOP→RUN operations.

• After the alarm output specified in (d2) turns ON, measurement will continue.

• The measurement stops when the current value reaches the 16-bit maximum. To continue the measurement, clear the current value of (d1) to (d1)+1.

#Note:

• The device specified in (d1) occupies 2 points. Be careful not to overlap with the device used for machine control.

• After the instruction stops running, the measurement stops and the output continues to be maintained.

Error code

Error code	Content	
4085H	When reading the specified device range exceeds th corresponding device range	ıe
4086H	When writing the specified device range exceeds the corresponding device range	Э
4084H	When the value of (s) is negative	
Example		
	MO HOUR K98 DO Y4	

When M0 = ON, the duration of the state is accumulated, the time is recorded in D0, and the seconds less than 1 hour are recorded in D1. When the accumulated time of D0 reaches 98 hours, the Y0 output state is ON. When the timing conditions are met, after reaching the specified value (K98), the accumulated timing will continue and the reading will continue to increase; the current time value D0 reaches the maximum value of 32767 hours and D1 reaches 3599 seconds, the timing measurement will stop. The current time values D0 and D1 are cleared to 0.

DHOUR/Hour measuring 32 bits

DHOUR(P)

The time for the input contact to be ON is measured in units of one hour.

-[DHOUR (s) (d1) (d2)]

Content, range and data type

Parameter	Content	Range	Data type	Data type (label)
(S)	The time when the alarm (d2) is turned ON (set by one hour)	0 to 2147483647	Signed BIN 32 bit	ANY32
(d1)	Device that stores the current value of measurement (specified	-	Unsigned BIN 32 bit	ANY32_ARRAY (Number of elements: 2)

				1	data reç failure r	gister f etentic	or pow on)	ver													
(d2)					Device when th expires	that tu ie time (alarm	rns ON limit n outpu	N ut)	-				Bit				ļ	ANY_	BOOL		
De	evice	e use	d																		
Instr	Rain	anDete	ices																	Offs mod	ePulse lifexateiosion
		Y	М	S	SM	D.b	KnX	KnY	KnM	KnS	т	С	D	R	SD	LC	HSC	к	н	[D]	XXP
DHO	UFFatra 1	ametei	r				•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
	Para 2	ametei	r										•	•	•					•	•
	Para 3	anetei	r ●	•	•	•														•	•

Features

• The input contact ON time is measured in units of 1 hour. When the cumulative ON time exceeds the time (BIN 32-bit data) specified in (s), the device specified in (d2) is set to ON.

- In (s)+1, (s), set the time until the alarm (d2) turns ON in units of 1 hour.
- (D1)+1 and (d1) store the current value measured in units of 1 hour. ((d1)+1: high bit, (d1): low bit)
- If the median of (d1)+1 and (d1) exceeds 2147483647, it will be modified to 2147483647.
- (D1)+2 stores the current value (in units of 1 second) of the measurement that is less than 1 hour.
- (D2) turns on when the current value (d1)+1, (d1) exceeds the time specified in (s).

• In order to continue to use the current value data even after the power of the CPU module is turned off, specify the data register for power failure retention to (d1). If you use general-purpose data registers, the current value data will be cleared by powering off the CPU module and STOP—RUN operations.

• After the alarm output specified in (d2) turns on, the measurement will continue.

• The measurement stops when the current value reaches the 32-bit maximum. To continue the measurement, clear the current value of (d1) to (d1)+2.

#Note:

• The device specified in (d1) occupies 3 points. Be careful not to overlap with the device used for machine control.

• After the instruction stops running, the measurement stops and the output continues to be maintained.

Error code)				
Error code		Conten	t		
4085H		When re corresp	eading the spec onding device	cified device rang range	e exceeds the
4086H		When w corresp	riting the spect onding device	ified device range range	exceeds the
4084H		When th	ne value of (s) i	s negative	
Example					
	MO {DHOUR	K1000	DO	YO	}

When M0=ON, the duration of this state is accumulated, the time is recorded in D1, D0, and the seconds less than 1 hour are recorded in D2. When the accumulated time of D1, D0 reaches 1000 hours, the Y0 output state is ON. When the timing conditions are met, after reaching the specified value (K1000), the accumulated timing will continue, and the reading will continue to increase; the current time values D1 and D0 reach the maximum value of 2147483647 hours, and when D2 reaches 3599 seconds, the timing measurement will stop and the timing should be restarted. The current time values D0, D1, and D2 must be cleared to 0.

STOH/16-bit data conversion of time data (second \rightarrow hour, minute, second)

STOH(P)

Convert the second 16-bit data stored in the device number specified in (s) into hour, minute, and second, and store the conversion result in the device specified in (d) and later.

-[STOH (s) (d)]

Content, range and data type

Parame	ter	Content		Ran	ge		Data ty	pe	Da	ata type (la	abel)
(s)		e start num the clock e conversio	ber 0 to 3 on	32767		Signed	BIN 16 bit	1A	NY16		
(d)		The device number the converted	e start at stores th clock data	- Ie			Signed	BIN 16 bit	Al (n	NY16_ARR umber of el	AY ements: 3)
Devic	e used										
Instruct	ionarametoDevi	ces								Offset modifie	Pulse cateoutension
	KnX	KnY	KnM	KnS	т	С	D	R	SD	[D]	XXP
STOH	Paramete ● 1	٠	•	•	٠	•	•	•	•	•	•
	Parameter 2	•	•	•	•	•	•	•	•	•	•

Features

Convert the second data stored after the device number specified in (s) into hour, minute, and second, and store the conversion result in the device specified in (d) and later.



Example

When 29,011 seconds are specified in (s)



Content

corresponding device range

corresponding device range

When the value of (s) exceeds the range

When reading the specified device range exceeds the

When writing the specified device range exceeds the

Error code

Error code

4085H

4086H

4084H

Example



Set D0 seconds to 12537

The hour, minute and second of D10 after the M0 coil is turned on are

D10	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
D11	0	0	1	1	1	0	0	0	0	0	0	0	0	0	0	0	28
D12	1	0	0	1	1	1	0	0	0	0	0	0	0	0	0	0	57

DSTOH/32-bit data conversion of time data (second \rightarrow hour, minute, second)

DSTOH(P)

Convert the second 32-bit data of second stored in the device number specified in (s) into hour, minute, and second, and store the conversion result in the device specified in (d) and later.

-[DSTOH (s) (d)]

Content, range and data type

Parameter	Content	Range	Data type	Data type (label)
(S)	The device start number that stores the clock data before conversion	0 to 117964799	Signed BIN 32 bit	ANY32
(d)	The device start number that stores the converted clock data	-	Signed BIN 16 bit	ANY16_ARRAY (number of elements: 3)

Device used



Features

Convert the second data stored after the device number specified in (s) into hour, minute, and second, and store the conversion result in the device specified in (d) and later.



Example

When 45,325 seconds is specified in (s)



Content

corresponding device range

corresponding device range

When the value of (s) exceeds the range

When reading the specified device range exceeds the

When writing the specified device range exceeds the

Error code

Error code 4085H

4086H

4084H

Example



Set D0 seconds to 2152537

The hour, minute and second of D10 after the M0 coil is turned on are

D10	1	0	1	0	1	0	1	0	0	1	0	0	0	0	0	0	597
D11	1	1	1	0	1	1	0	0	0	0	0	0	0	0	0	0	55
D12	1	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	37

TCMP/Clock data comparison

TCMP(P)

Compare the comparison time specified in (s1), (s2), (s3) with the time data specified in (s4), and turn the bit device specified in (d) ON/OFF according to their size match.

-[TCMP (s1) (s2) (s3) (s4) (d)]

Content, range and data type

Parameter	Content	Range	Data type	Data type (label)
(s1)	Specify the "hour" of the comparison base time.	0 to 23	Signed BIN 16 bit	ANY16
(s2)	Specify the "minute" of the comparison base time.	0 to 59	Signed BIN 16 bit	ANY16
(s3)	Specify the "second" of the comparison base time.	0 to 59	Signed BIN 16 bit	ANY16
(s4)	Specify the "hour" of the time data (hour, minute, second).	-	Signed BIN 16 bit	ANY16_ARRAY
(d)	The bit device is turned ON/OFF according to the comparison result.	-	Bit	ANYBIT_ARRAY
Device used				

Instruicaicamlate	es																moc	e P uise lifeoateiosion
Y	М	S	SM	D.b	KnX	KnY	KnM	KnS	т	С	D	R	SD	κ	н	Е	[D]	XXP
TCMPParameter 1	•				•	•	•	•	•	•	•	•	•	•	•		٠	•
Parameter 2	r				•	•	•	•	•	•	•	•	•	•	•		•	•
Parameter 3	•				•	•	•	•	•	•	•	•	•	•	•		٠	•
Parameter 4	ſ								•	•	•	•	•				•	•
Param●ter 5	•	•	•	•													•	•

Features

Compare the time of the reference time (hour, minute, second) [(s1), (s2), (s3)] with the time data (hour, minute, second) [(s4), (s4)+1, (s4)+2] Compare the size and turn on/off the 3 points from (d) according to the result of the same size.



#Note:

The device specified in (s4) and (d) occupies 3 points. Be careful not to overlap with the device used for machine control.

When using the clock data time (hour, minute, second) of the built-in real-time clock of the CPU module, use the TRD(P) instruction to read the value of the special register and assign the word device to each operand.

Error code

Error code	Content
4085H	When reading the specified device range exceeds the corresponding device range
4086H	When writing the specified device range exceeds the corresponding device range
4084H	When the value specified in (s) and (s4) is not in the range of 0 to 23
	When the value specified in $(s2),(s3)$ $(s4)+1$ and $(s4)+2$ is not in the range of 0 to 59
Example	
МО	



Set D10 to 1, D11 to 30, D12 to 0

When M0 is turned on, the time that D23 will come is 0:31:27

D23	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
D24	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	31
D25	1	1	0	1	1	0	0	0	0	0	0	0	0	0	0	0	27

M10 is turned ON

M10	1
M11	0
M12	0

TZCP/Clock data bandwidth comparison

TZCP(P)

Compare the comparison time of the high and low points specified in (s1) and (s2) with the time data specified in (s3), and turn the bit device specified in (d) ON/OFF according to its size and bandwidth.

-[TZCP (s1) (s2) (s3) (d)]

Content, range and data type

Parame	eter	Content Specify the "hour" of t					D	ata type		Data	a type (lab	oel)
(s1)		Specify lower li minute,	r the "hou mit time (, second)	r" of the hour,	-		S	igned BI	N 16 bit	AN۱ (nun	(16_ARRA nber of ele	AY ments: 3)
(s2)		Specify lower li minute,	r the "hou mit time (, second)	r" of the hour,	-		S	igned BI	N 16 bit	AN۱ (nun	(16_ARRA nber of ele	AY ments: 3)
(s3)	Specify "hour" of time data (hour, minute, second) The bit device is turn				-		S	igned BI	N 16 bit	AN۱ (nun	16_ARRA	.Y ments: 3)
(d)	The bit device is turned ON/OFF according to the comparison result.				-		В	it		AN) (nun	(16_ARRA nber of elei	Y ments: 3)
Devi	ce used											
Instruc	tiðarametðævi	ices									Offset modifie	Pulse caeiduension
	Y	М	S	SM	D.b	т	С	D	R	SD	[D]	ХХР
TZCP	Parameter 1					•	•	•	•	•	•	•
	Parameter 2					•	•	•	•	•	•	•
	Parameter 3					•	•	•	•	•	•	•
	Paramet€ 4	•	٠	•	•						•	•

Features

Compare the comparison time of the high and low points specified in (s1) and (s2) with the time data specified in (s3), and turn the bit device specified in (d) ON/OFF according to its size and bandwidth.



#Note:

• The devices specified in (s1), (s2), (s3), (d) occupy 3 points. Be careful not to overlap with the device used for machine control.

• When using the clock data time (hour, minute, second) of the built-in real-time clock of the CPU module, use the TRD(P) instruction to read the value of the special register and assign the word device to each operand.

• When (s1)> (s2), two of (d), (d)+1, (d)+2 are ON/OFF.

Error code

Error code				Content				
4085H				When read correspond	ing the specificing device rar	ed device rang Ige	je exceeds tl	те
4086H				When writir correspond	ng the specifie ing device rar	d device range nge	e exceeds th	е
4084H				When the v range of 0 t	alue specified o 23	in (s1), (s2) a	nd (s3) is no	t in the
				When the (s2)+2 and	e value specifi (s3)+2 is not i	ed in (s1)+1, (in the range of	s2)+1, (s3)+ 0 to 59	1, (s1)+2,
Example								
	M0 [TZC	Р	DO	D10	D20	M10	}	

Set D0 time to 16:30:00 and D10 time to 4:30:0

DO	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	16
D1	0	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	30
D2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

D10	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	4
D11	0	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	30
D12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

After the coil is turned on, the reading time to D20 time is 8:30:00

D20	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	8
D21	0	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	30
D22	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

M0/M12 is ON

M10	1
M11	0
M12	1

Data control instructions

BAND/BIN 16-bit data dead zone control

BAND(P)

The input value (BIN 16-bit value) specified in (s3) controls the output value stored in the device specified in (d) according to the upper and lower limits of the dead zone specified in (s1) and (s2).

-[BAND (s1) (s2) (S3) (d)]

Content, range and data type

Parameter	Content	Range	Data type	Data type (label)
(s1)	Lower limit of dead zone (no output zone)	-32,768 to +32,767	Signed BIN 16 bit	ANY16_S
(s2)	Upper limit of dead zone (no output zone)	-32,768 to +32,767	Signed BIN 16 bit	ANY16_S
(S3)	Input value controlled by dead zone control	-32768 to +32,767	Signed BIN 16 bit	ANY16_S
(D)	The start number of the device that stores the output value controlled by the dead zone control	-	Signed BIN 16 bit	ANY16_S

Device used

Instruc	t Ra rame De vice	es										Offse modi	t Pulse ficaetxiotemsion		
	KnX KnY KnM KnS T C D R SD K H														
BAND	Paramet e r 1	•	•	•	•	•	•	•	•	•	•	•	•		
	Paramet e r 2	•	•	•	•	•	•	•	•	•	•	•	•		
	Paramet e r 3	•	•	•	•	•	•	•	•			•	•		
	Parameter 4	•	•	•	•	•	•	•	•			•	•		

Features

The input value (BIN 16-bit value) specified in (s3) controls the output value stored in the device specified in (d) according to the upper and lower limits of the dead zone specified in (s1) and (s2). The output value is controlled as follows.

0

Condition

When dead zone low limit (s1)> input value (s3)

When dead zone high limit (s1) <input value (s3)

When dead zone low limit $(s1) \le$ input value $(s3) \le$ dead zone low limit (s2)

The value stored in the output value

Input value (s3)-Dead zone low limit (s1) Input value (s3)- Dead zone high limit (s2)

•When the output value stored in (d) is a signed BIN 16-bit value, and the operation result exceeds the range of -32768 to 32767, the situation is shown in the following example.

For example, when (s1) is 10 and (s3) is -32768,

the output value = -32768-10=8000H-000AH=7FFFH=32758.



• When D0<1,000, the value of (D0)-1,000 is stored in D1.

DBAND/BIN 32-bit data dead zone control

DBAND(P)

The input value (BIN 32-bit value) specified in (s3) controls the output value stored in the device specified in (d) according to the upper and lower limits of the dead zone specified in (s1) and (s2).

-[DBAND (s1) (s2) (S3) (d)]

Content, range and data type

Parameter	Content	Range	Data type	Data type (label)
(s1)	Dead zone low limit (no output zone)	-2,147,483,648 to +2,147,483,647	Signed BIN 32 bit	ANY32_S
(s2)	Dead zone high limit (no output zone)	-2,147,483,648 to +2,147,483,647	Signed BIN 32 bit	ANY32_S
(S3)	Input value controlled by dead zone control	-2,147,483,648 to +2,147,483,647	Signed BIN 32 bit	ANY32_S
(d)	The start number of the device that stores the output value controlled by the dead zone control	-	Signed BIN 32 bit	ANY32_S

Device used

Instruc Flar am@evic	es												Offset Pulse modificeattension	
KnX	KnY	KnM	KnS	т	С	D	R	SD	LC	HSC	к	н	[D]	XXP
DBANDParameer 1	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Parame€r 2	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Parame ⊕ r 3	•	•	•	•	•	•	•	•	•	•			•	•
Parameter 4	•	•	•	•	•	•	•	•	٠	•			•	•

Features

The input value (BIN 32-bit value) specified in (s3) controls the output value stored in the device specified in (d) according to the upper and lower limits of the dead zone specified in (s1) and (s2). The output value is controlled as follows.

Condition

When dead zone low limit ((s1), (s1)+1)> input value ((s3), (s3)+1)

When dead zone high limit ((s1), (s1)+1) <input value ((s3), (s3)+1)

When dead zone low limit $((s1), (s1)+1) \le$ input value $((s3), (s3)+1) \le$ dead zone high limit ((s2), (s2)+1)

The value stored in the output value

Input value ((s3), (s3)+1)-dead zone low limit ((s1), (s1)+1)

Input value ((s3), (s3)+1)-dead zone high limit ((s2), (s2)+1)

• When the output value stored in (d) is a signed BIN 32-bit value, and the operation result exceeds the range of -2,147,483,648 to 2,147,483,647, the situation is as the following example. For example, When (s1) and (s1)+1 are 1000, (s3) and (s3)+1 are -2,147,483,648, then the output value=

0

-2,147,483,648-1000=8000000H-000003E8H=7FFFC18H=2,147,482,648.



Error code

Error code	Content
4085H	When the specified device range for reading exceeds the range of the corresponding device.
4086H	When the specified device range for writing exceeds the range of the corresponding device.
4084H	When the low limit specified in (s1) is greater than the high limit specified in (s2).

Example



- When (D1, D0)<(-10,000), the value of (D1, D0)-(-10,000) is stored in (D11, D10).
- When -10,000≦(D1, D0)≦10,000, 0 is stored in (D11, D10).
- When 10,000< (D1, D0), the value of (D1, D0)-10,000 is stored in D1.

BINDA/BIN 16-bit data → Decimal ASCII conversion

BINDA(P)

Convert the BIN 16-bit data specified in (s) and the value of each digit in decimal numbers into ASCII codes and store them after the device number specified in (d).

-[BINDA(s)(d)]

Content, range and data type

Parameter	Content	Range	Data type	Data type (label)
(s)	BIN data for ASCII conversion	-32768 to +32767	Signed BIN 16 bit	ANY16_S
(d)	The start number of the device storing the conversion result	-	String	ANYSTRING_SINGLE

Device used

InstructRarameteevices

Offset Pulse modificaetxideension



Features

Convert the BIN 16-bit data specified in (s) and the value of each digit in decimal numbers into ASCII codes and store them after the device number specified in (d).



←Only store 0 when SM191 is OFF

For example, when -12,345 is specified in (s) (in the case of specifying signed)



The calculation result stored in (d) will be as below.

• In "Sign", 20H is stored when the BIN data is positive, and 2DH is stored when it is negative.

• In the 0 to the left of the effective digit, 20H is stored. (Suppress 0.) For example, in the case of "00325", "00" becomes 20H, and "325" becomes the effective digit.

• When storing data to the device specified in (d)+3, when SM191 (output character number switching signal) is OFF, 0 is stored, and it does not change when it is ON.

#Note: The number of occupied points of (d) is 3 when SM191 is ON, and it is 4 when SM191 is OFF.

Error code

Error code

4085H 4086H

Example

Content

The read address of (s) exceeds the device range. The write address of (d) exceeds the device range.



When X000 is ON, convert the value of 16-bit data (BIN) D1000 into decimal ASCII code, and then use PR instruction to output the

converted ASCII code character by character to the program of Y040 to Y057.

DBINDA/BIN 32-bit data → Decimal ASCII conversion

DBINDA(P)

Convert the BIN 32-bit data specified in (s) and the value of each bit in decimal numbers into ASCII codes and store them after the device number specified in (d).

-[DBINDA(s)(d)]

Content, range and data type

Parameter	Co	ontent			Rang	Range			Data type				Data type (label)			
(s)	BI	N data fo nversior	or ASC	II	-2,147483648 to 2147483647			Sig	Signed BIN 32 bit				ANY32_S			
(d) The start number of the device storing the conversion result			-			Stri	String				ANYSTRING_SINGLE					
Device used																
Instruc Rar am @ev io	ces												Offs mod	et Pulse ifiœettension		
KnX	KnY	KnM	KnS	т	С	D	R	SD	LC	HSC	κ	н	[D]	ХХР		
DBIND R arameer 1	•	•	•	•	•	•	•	•	•	•	•	•	•	•		
Parameter 2						•	•	•					٠	•		

Features

Convert the BIN 32-bit data specified in (s) and the value of each bit when expressed in decimal numbers into ASCII codes, and store them after the device number specified in (d).

For example, when -12345678 is specified in (s). (in the case of specifying signed)



The calculation result stored in (d) will be as below.

• In "Sign", 20H is stored when the BIN data is positive, and 2DH is stored when it is negative.

• 20H is stored at 0 to the left of the effective number of digits. (Suppress 0.) For example, in the case of "0012034560", "00" becomes 20H, and "12034560" becomes effective digits.

• For the data stored in the upper 8 bits of the device specified in (d)+5, 0 will be stored when SM191 (output character switching signal) is OFF, and 20H will be stored when it is ON.

#Note: (d) Occupies 6 points.

Error code



When X000 is ON, convert the value of 32-bit data (BIN) D1000 into decimal ASCII code, and then use PR (FNC 77) instruction to output the converted ASCII code character by character to the program in Y040 to Y051 in time and time division.

DABIN/Decimal ASCII -> BIN conversion

DABIN(P)

Digital ASCII code (30H to 39H) is a instruction to convert real data into BIN data.

-[DABIN (s) (d)]

Content, range and data type

Paramete	er	Content			Range		Dat	a type		Data type (label)		
(s) The start number of the device that stores the data (ASCII code) to be converted into a BIN value				-		Stri	ng		ANYSTRIN	G_SINGLE		
(d) The device number for storing conversion result					-		BIN	16 bit		ANY16_S		
Device	used											
Instructio	aramete Dev	vices								Offset modifie	Pulse ati ext ension	
	Kn	Y	KnM	KnS	т	С	D	R	SD	[D]	XXP	
DABIN	Parameter 1						•	•	•	•	•	
	Parameter● 2		•	•	•	•	•	•	•	•	•	

Features

The decimal ASCII data stored after the device number specified in (s) is converted into BIN 16-bit data and stored in the device specified in (d).



• The ASCII data specified in (s) to (s)+2 is within the range of -32,768 to +32,767.

• In "Sign", set 20H when the converted data is positive, and set 2DH when it is negative. (When other than 20H or 2DH is set, it will be treated as positive data. (DABIN(P))

• The range of the ASCII code set in each digit is 30H to 39H.

• When the ASCII code set in each bit is 20H or 00H, it will be treated as 30H.

Error code

Error code	Content
4084H	When the Sign data exceeds the range of 30H to 39H, 20H, 00H, 2DH;
	When the ASCII code of each bit specified in (s) to (s)+2 exceeds the range of 30H to 39H, 20H, 00H;
	When the ASCII data specified in (s) to (s)+2 is other than -32,768 to +32,767.
4085H	The read address of (s) exceeds the device range.
4086H	The write address of (d) exceeds the device range.

When X000 is ON, the Signs set in D20 to D22 and the ASCII code data of 5-digit decimal numbers are converted into BIN values, and then stored in the program of D0.

Example



DDABIN/Decimal ASCII → BIN32-bit data conversion

DDABIN(P)

The decimal ASCII data stored after the device number specified in (s) is converted into BIN 32-bit data and stored in the device number specified in (d).

-[DDABIN (s) (d)]

Content, range and data type

Parameter	С	ontent			Range		D	ata type		Data	type (la	bel)	
(s) The start number of the device that stores data (ASCII code) to be converted into a BIN value				of pres to a BIN	-		S	tring		ANY	ANYSTRING_SINGLE		
(d)	TI st	he devid oring co	ce numbe onversior	er for n result	-		S	igned BIN	ANY	ANY32_S			
Device used													
InstructiBarametBe	vices										Offset modif	Pulse icaeictension	
Kn	Y	KnM	KnS	т	С	D	R	SD	LC	HSC	[D]	ХХР	
DDABIN Parameter 1						•	•	•			•	•	
Parametæ 2		•	•	٠	•	•	•	•	•	•	•	•	

Features

The decimal ASCII data stored after the device number specified in (s) is converted into BIN 32-bit data and stored in the device specified in (d).

	b15	b8 b7		b0							
(s)	ASCII 1	09	ASCII S								
(s)+1	ASCII 1	07	ASCII 10 ⁸				(d)+1			(d)	
(s)+2	ASCII 1	05	ASCII 10 ⁶			b31		b16	b15		b0
(s)+3	ASCII 1	0 ³	ASCII 10 ⁴		\square		High 16 bit			LOW 16 DIC	
(s)+4	ASCII 1	0 ¹	ASCII 10 ²					BI	N32		

ASCII S	ASCII code	ASCII S	ASCII code
ASCII 10 ⁰	Units of ASCII code	ASCII 10 ⁵	Hundred thousands of ASCII code
ASCII 10 ¹	Tens of ASCII code	ASCII 10 ⁶	Millions of ASCII code

ASCII 10 ²	2	Hundreds of AS	CII code AS	CII 10 ⁷		Ten millions of	ASCII code			
ASCII 10 ³ Thousands of ASCII code				SCII 10 ⁸		Hundred millio code	Hundred millions of ASCII code			
ASCII 104	4	Tens thousands	of ASCII code AS	CII 10 ⁹		billions of ASC	II code			
When -	1234543210 is spe	ecified in (s) (Wh	nen signed is spe	cified)						
	b15	b8 b7		b0						
(s)	31H (1)	1	2DH (-)							
(s)+1	33H (3)	1	32H (2)			(d) + 1	(4)			
(s)+2	35H (5)	1	34H (4)		<u>_</u>	(u) + 1	(u)			
(s)+3	33H (3)	1	34H (4)			-12345	43210			
(s)+4	31H (1)	1	32H (2)							
(s)+5			30H (0)							

• The ASCII data specified in (s) to (s)+5 is within the range of -2,147,483,648 to +2,147,483,647. In addition, the data stored in the high byte of (s)+5 will be ignored.

• In the Sign data, set 20H when the converted data is positive, and set 2DH when it is negative. (When other than 20H or 2DH is set, it will be treated as positive data. (DABIN(P))

- The range of ASCII code set in each digit is 30H to 39H.
- When the ASCII code set in each bit is 20H or 00H, it will be treated as 30H.

Error code	
Error code	Content
4084H	When the Sign data exceeds the range of 30H to 39H, 20H, 00H and 2DH;
	When the ASCII code of each bit specified in (s) to (s)+5 exceeds the range of 30H to 39H, 20H and 00H;
	When the ASCII data specified in (s) to (s)+5 exceeds the range of -2,147,483,648 to +2,147,483,647
4085H	The read address of (s) exceeds the device range.
4086H	The write address of (d) exceeds the device range.
Example	
	0 M [DDABIN D20 D0]

When X000 is ON, the Signs set in to D20 to D25 and the ASCII code data of 10-digit decimal numbers are converted into BIN values and then saved to the program in D0 to D1.

LIMIT/ BIN 16-bit data high and low limit control

LIMIT(P)

The input value (BIN 16-bit value) specified in (s3) controls the output value stored in the device specified in (d) according to the upper and lower limit value ranges specified in (s1) and (s2).

-[LIMIT (s1) (s2) (s3) (d)]

Content, range and data type

Parameter	Content	Range	Data type	Data type (label)
s1	Low limit value (minimum output limit value)	-32,768 to 32,767	BIN16 bit	ANY16_S
s2	High limit value (maximum output limit value)	-32,768 to 32,767	BIN16 bit	ANY16_S
s3	Input value controlled by high and low limit control	-32,768 to 32,767	BIN16 bit	ANY16_S
d	The start number of device that stores the output value controlled by high and low limit control	-	BIN16 bit	ANY16_S

Device used

Instru	nstructRarametaevices												Offset Pulse modificaetioteension	
	KnX	KnY	KnM	KnS	т	С	D	R	SD	К	н	[D]	XXP	
LIMIT	Paramet ● 1	•	•	•	•	•	•	•	•	•	•	•	•	
	Paramet ● 2	•	•	•	•	•	•	•	•	•	•	•	•	
	Paramet ● 3	•	•	•	•	•	•	•	•			•	•	
	Parameter 4	•	•	•	•	•	•	•	•			•	•	

Features

The input value (BIN 16-bit value) specified in (s3) controls the output value stored in the device specified in (d) according to the high and low limit value ranges specified in (s1) and (s2). The output value is controlled as follows.

ConditionThe value stored in the output valueLow limit value (s1)>input value (s3)Low limit value (s1)High limit value (s1) < input value (s3)</td>High limit value (s2)Low limit value (s1) \leq input value (s3) \leq high limit value (s2)Input value (s3)

• Only in the case of controlling high limit value, set the minimum value of data range in the low limit value specified in (s1).

• Only in the case of controlling low limit value, set the maximum value of data range in the high limit value specified in (s2).



• When 5,000 <D0, D1 is 5,000.

DLIMIT/BIN 32-bit data high and low limit control

DLIMIT(P)

The input value (BIN 32-bit value) specified in (s3) controls the output value stored in the device specified in (d) according to the range of high and low limit values specified in (s1) and (s2).

-[DLIMIT (s1) (s2) (s3) (d)]

Content, range and data type

Parameter	Content	Range	Data type	Data type (label)
s1	Low limit value (minimum output limit value)	-2,147,483,648 to 2,147,483,647	BIN32 bit	ANY32_S
s2	High limit value (maximum output limit value)	-2,147,483,648 to 2,147,483,647	BIN32 bit	ANY32_S

s3		Inp by cor	out value high an ntrol	e contro d low lir	lled nit	-2,147 2,147	7,483,64 ,483,64	48 to 7	BIN	32 bit			ANY32	_S	
d		The start number of the device that stores the output value controlled by high and low limit control			-	- BIN32 bit				ANY32_S					
Dev	ice used														
Instruc	: Hər am @ev ic	es												Offse mod	et Pulse ificeattension
	KnX	KnY	KnM	KnS	т	С	D	R	SD	LC	HSC	к	н	[D]	ХХР
DLIMIT	Parameer 1	•	•	•	•	•	•	•	•	•	•	•	٠	•	•
	Parameer 2	•	•	•	•	•	•	•	•	•	•	•	٠	•	•
	Parameer 3	•	•	•	•	•	•	•	•	•	•			•	•
	Parameter 4	•	•	•	•	•	•	•	•	•	•			•	•

Features

The input value (BIN 32-bit value) specified in (s3) controls the output value stored in the device specified in (d) according to the range of high and low limit values specified in (s1) and (s2). The output value is controlled as follows.

Condition

Low limit value ((s1), (s1)+1)> input value ((s3), (s3)+1) High limit value ((s2), (s2)+1) <input value ((s3), (s3)+1) Low limit value ((s1), (s1)+1) \leq input value ((s3), (s3)+1) \leq high limit value ((s2), (s2)+1)

The value stored in the output value

D1

Low limit value $((s1), (s1)+1)$
High limit value ((s2), (s2)+1)
Input value $((s3), (s3)+1)$

• Only in the case of controlling high limit value, set the minimum value of data range in the low limit value specified in (s1).

• Only in the case of controlling low limit value, set the maximum value of data range in the high limit value specified in (s2).

Error code

Error code Content 4085H The read address exceeds the device range 4086H The write address exceeds the device range 4084H High limit <low limit Example

Operation:

• When (D1, D0) <10,000, (D11, D10) is 10,000.

0

• When $10,000 \le (D1, D0) \le 1,000,000$, (D11, D10) is the value of (D1, D0).

{DLIMIT K10000 K1000.. D0

• When 1,000,000 <(D1, D0), (D11, D10) is 1,000,000.

SCL/BIN 16-bit unit scale (coordinate data of each point)

SCL(P)

The scaling conversion data (16-bit data unit) specified in (s2) is scaled from the input value specified in (s1), and the calculation result is stored in the device specified in (d).

-[SCL (s1) (s2) (d)]

Content, range and data type

Parameter	Content	Range	Data type	Data type (label)
(s1)	The input value for scaling or the start number of device storing the input value	-32,768 to 32,767	Signed BIN 16 bit	ANY16_S
(s2)	The start number of the device storing conversion data for scaling	-	Signed BIN 16 bit	ANY16_S
(d)	The start number of the device that stores the output value controlled by scaling	-	Signed BIN 16 bit	ANY16_S
Device used				

Instru	structRarame Dezvices										Offset Pulse modificaetxooension			
	KnX	KnY	KnM	KnS	т	С	D	R	SD	К	Н	[D]	ХХР	
SCL	Paramet ● 1	•	•	•	•	•	•	٠	•	•	٠	•	•	
	Parameter 2						•	•	•			•	•	
	Parameter 3	•	•	•	•	•	•	•	•			•	•	

Features

For the scale conversion data (16-bit data unit) specified in (s2), scale by the input value specified in (s1), and store the operation result in the device specified in (d). Scale conversion is performed based on the scale conversion data stored after the device specified in (s2).

Setting items (n represents (s2))	Device allocation		
Coordinate points		(s2)	
Point 1	X coordinate	(s2)+1	
	Y coordinate	(s2)+2	
Point 2	X coordinate	(s2)+3	
	Y coordinate	(s2)+4	
Point n	X coordinate	(s2)+2n-1	
	Y coordinate	(s2)+2n	



• If the operation result is not an integer value, round the first digit below the decimal point.

• The X coordinate data of the conversion data for scaling should be set in ascending order.

• (s1) should be set within the range of conversion data for scaling (device value of (s2)).

• If the same X coordinate is specified for multiple points, the Y coordinate value of the second point will be output.

- Set the number of coordinate points of the conversion data for scaling within the range of 1 to 32,767.
- Setting example of conversion table for scaling.

In the case of scaling conversion characteristics as shown in the figure below, set it as the following data sheet.



Set items

Sett device and content

Remarks

		When R0 is specifi	ed in (s2)	Set content			
Coordinate points		(s2)	R0	K10			
Point 1	X coordinate	(s2)+1	R1	K5			
	Y coordinate	(s2)+2	R2	K20			
Point 2	X coordinate	(s2)+3	R3	K30			
	Y coordinate	(s2)+4	R4	K50			
Point 3	X coordinate	(s2)+5	R5	K100			
	Y coordinate	(s2)+6	R6	K200			
Point 4	X coordinate	(s2)+7	R7	K25	If the coordinates		
	Y coordinate	(s2)+8	R8	K200	are specified		
Point 5	X coordinate	(s2)+9	R9	K70	intermediate value		
	Y coordinate	(s2)+10	R10	K200	could be the output		
Point 6	X coordinate	(s2)+11	R11	K250	value.		
	Y coordinate	(s2)+12	R12	K250	In this example, the output value (median value) is specified by the Y coordinate of point 5.		
					When the X coordinate is the same at 3 points or more, the value of the 2nd point is also output.		
Point 7	X coordinate	(s2)+13	R13	K250			
	Y coordinate	(s2)+14	R14	K90			
Point 8	X coordinate	(s2)+15	R15	K350	If the coordinates		
	Y coordinate	(s2)+16	R16	K90	are specified by two		
Point 9	X coordinate	(s2)+17	R17	K350	value is the value of		
	Y coordinate	(s2)+18	R18	K30	the Y coordinate of the next point.		
					In this example, the output value is specified by the Y coordinate of point 9.		
Point 10	X coordinate	(s2)+19	R19	K400			
	Y coordinate	(s2)+20	R20	K7			
Error code							
Error code			Content				
4085H			When the specified of the corresponding	levice range for readir device.	ng exceeds the range		
4086H			When the specified of the corresponding	levice range for writin device.	g exceeds the range		
4084H			When the Xn data of data table is not sorted in a order. However, the instruction will be executed position where the error occurs;				
			When the input va the set scale converse	lue specified in (s1) ex sion data;	ceeds the range of		
			When the number less than 0.	of start coordinate po	ints of device (s2) is		



	۲				
0 SM100		{mov	К5	RO	}
		{mov	K-100	R1	}
		{mov	KO	R3	}
		{mov	KO	R5	}
		{mov	KO	R7	}
		{mov	K100	R9	}
		{MOA	K-52	R2	}
		{MOV	к-2	R4	}
		{MOV	KO	R6	3
		{mov	К2	R8	}
		{mov	к52	R10	}
	└──{scl	DO	RO	D100	3

 $\frac{1}{2}X - 2$ When -100 \leq D0(X) < 0, D100(Y)=

 $\frac{1}{2}x + 2$

when D0(X)=0, D100(Y)=0;

when $0 < D0(X) \le 100$, D100(Y) =

DSCL/32-bit unit scale (coordinate data of each point)

DSCL(P)

The conversion data (32-bit data unit) for scaling specified in (s2) is scaled by the input value specified in (s1), and the operation result is stored in the device specified in (d).

-[DSCL (s1) (s2) (d)]

Content, range and data type

Param	neter	Co	ntent			Rang	е		Dat	a type			Data ty	vpe (lab	el)
(s1)		Th sca nui sto	e input v aling or t mber of oring the	value fo the star the dev input v	r t vice alue	-2,147 2,147	7,483,6 ,483,64	48 to 7	Sig	ned BIN	I 32 bit		ANY32	_S	
(s2)		Th the coi sca	e start n device nversior aling	umber storing data fo	of or	-			Sig	ned BIN	l 32 bit		ANY32	_S	
(d)		Th de out by	e start n vice tha tput valu scaling	iumber t stores Je contr	nber of the cores the controlled		-		Signed BIN 32 bit			ANY32_S			
Dev	ice used														
Instru	c fiar am@evic	e												Offse mod	et Pulse ifiœattension
	KnX	KnY	KnM	KnS	т	С	D	R	SD	LC	HSC	к	н	[D]	ХХР
DSCL	Parameer 1	•	•	•	•	•	•	•	•	•	•	•	•	٠	•
	Parameter 2						•	•	•					•	•
	Parameter 3	•	•	•	•	•	٠	٠	•	•	•			•	•

Features

The conversion data (32-bit data unit) for scaling specified in (s2) is scaled by the input value specified in (s1), and the operation result is stored in the device number specified in (d). The scale conversion is performed based on the scale conversion data stored after the device specified in (s2).

Set items (n represents the number of	coordinate points specified in (s2))	Device allocation
Coordinate points		(s2)+1, (s2)
Point 1	X coordinate	(s2)+3, (s2)+2
	Y coordinate	(s2)+5, (s2)+4
Point 2	X coordinate	(s2)+7, (s2)+6
	Y coordinate	(s2)+9, (s2)+8
Point n	X coordinate	(s2)+4n-1, (s2)+4n-2
	Y coordinate	(s2)+4n+1, (s2)+4n



• If the calculation result is not an integer value, round the first digit below the decimal point.

• The X coordinate data of the conversion data for scaling should be set in ascending order.

- For (s1), set within the range of the conversion data for scaling ((s2), (s2) + 1 device value).
- If the same X coordinate is specified for multiple points, the Y coordinate value of the second point will be output.
- Set the number of coordinate points of conversion data for scaling within the range of 1 to 2,147,483,647.
- Setting example of conversion table for scaling.

In the case of scaling conversion characteristics as shown in the figure below, set it as the following data sheet.



	Y coordinate	(s2)+5, (s2)+4	R5, R4	K7						
Point 2	X coordinate	(s2)+7, (s2)+6	R7, R6	K20						
	Y coordinate	(s2)+9, (s2)+8	R9, R8	K30						
Point 3	X coordinate	(s2)+11, (s2)+10	R10, R11	K50						
	Y coordinate	(s2)+13, (s2)+12	R13, R12	K100						
Point 4	X coordinate	(s2)+15, (s2)+14	R15, R14	K200	if the coordinates					
	Y coordinate	(s2)+17, (s2)+16	R17, R16	K25	are specified					
Point 5	X coordinate	(s2)+19, (s2)+18	R19, R18	K200	intermediate value					
	Y coordinate	(s2)+21, (s2)+20	R21, R20	K70	could be the output					
Point 6	X coordinate	(s2)+23, (s2)+22	R23, R22	K200	value.					
	Y coordinate	(s2)+25, (s2)+24	R25, R24	K250	In this example, the output value (median value) is specified by the Y coordinate of point 5.					
					When the X coordinate is the same at 3 points or more, the value of the 2nd point is also output.					
Point 7	X coordinate	(s2)+27, (s2)+26	R27, R26	K250						
	Y coordinate	(s2)+29, (s2)+28	R29, R28	K90						
Point 8	X coordinate	(s2)+31, (s2)+30	R31, R30	K350	If the coordinates					
	Y coordinate	(s2)+33, (s2)+32	R33, R32	K90	are specified by two					
Point 9	X coordinate	(s2)+35, (s2)+34	R35, R34	K350	value is the value of					
	Y coordinate	(s2)+37, (s2)+36	R37, R36	K30	the Y coordinate of the next point.					
					In this example, the output value is specified by the Y coordinate of point 9.					
Point 10	X coordinate	(s2)+39, (s2)+38	R39, R38	K400						
	Y coordinate	(s2)+41, (s2)+40	R41, R40	K7						
Error code										
Error code			Content							
4085H			When the speci of the correspor	fied device range for nding device.	reading exceeds the range					
4086H			When the speci of the correspor	fied device range for nding device.	writing exceeds the range					
4084H			When the Xn da order. However position where t	ata of data table is no , the instruction will b the error occurs;	t sorted in ascending e executed until the					
			When the inp the set scale co	ut value specified in nversion data;	(s1) exceeds the range of					
			When the number of start coordinate points of device (s2) i less than 0.							

Example

01 LX5V programing manual - 07-5 Basic instruction



SCL2/BIN 16-bit unit scale (X/Y coordinate data)

SCL2(P)

The conversion data (16-bit data unit) for scaling specified in (s2) is scaled by the input value specified in (s1), and the operation result is stored in the device specified in (d).

-[SCL2 (s1) (s2) (d)]

Content, range and data type

Parameter	Content	Range	Data type	Data type (label)
(\$1)	The input value for scaling or the start number of the device storing the input value	-32,768 to 32,767	Signed BIN 16 bit	ANY16_S
(s2)	The start number of the device storing conversion data for scaling	-	Signed BIN 16 bit	ANY16_S
(d)	The start number of the device that stores the output value controlled by scaling		Signed BIN 16 bit	ANY16_S

Device used

Instruc	tRarametævic	es										Offse modi	t Pulse ficaetxiotemsion
	KnX	KnY	KnM	KnS	т	С	D	R	SD	κ	н	[D]	XXP
SCL2	Paramet ● 1	•	•	•	•	•	•	•	•	•	•	•	•
	Parameter 2						•	•	٠			•	•
	Parameter 3	•	•	•	•	٠	•	•	٠			٠	•

Features

The conversion data (16-bit data unit) for scaling specified in (s2) is scaled by the input value specified in (s1), and the operation result is stored in the device number specified in (d). The scale conversion is performed based on the scale conversion data stored after the device specified in (s2).

Set items (n represents the number of	coordinate points specified in (s2))	Device allocation
Coordinate points		(s2)
X coordinate	Point 1	(s2)+1
	Point 2	(s2)+2
	Point N	(s2)+N
Y coordinate	Point 1	(s2)+N+1
	Point 2	(s2)+N+2
	Point N	(s2)+2N



• If the operation result is not an integer value, round the first digit below the decimal point.

• The X coordinate data of the conversion data for scaling should be set in ascending order.

• For (s1), set within the range of the conversion data for scaling ((s2), (s2) + 1 device value).

• If the same X coordinate is specified for multiple points, the Y coordinate value of the second point will be output.

- Set the number of coordinate points of conversion data for scaling within the range of 1 to 32,767.
- Setting example of conversion table for scaling.

In the case of scaling conversion characteristics as shown in the figure below, set it as the following data sheet.



Set items

Set device and content

Remarks

	When R0 is specifi	ed in (s2)	Set content	
	(s2)	R0	K10	
Point 1	(s2)+1	R1	K5	
Point 2	(s2)+2	R2	K20	
Point 3	(s2)+3	R3	K50	
Point 4	(s2)+4	R4	K200	Refer to #1
Point 5	(s2)+5	R5	K200	
Point 6	(s2)+6	R6	K200	
Point 7	(s2)+7	R7	K250	
Point 8	(s2)+8	R8	K350	Refer to #2
Point 9	(s2)+9	R9	K350	
Point 10	(s2)+10	R10	K400	
Point 1	(s2)+11	R11	K7	
Point 2	(s2)+12	R12	K30	
Point 3	(s2)+13	R13	K100	
Point 4	(s2)+14	R14	K25	Refer to#1
Point 5	(s2)+15	R15	K70	
Point 6	(s2)+16	R16	K250	
Point 7	(s2)+17	R17	K90	
Point 8	(s2)+18	R18	K90	Refer to #2
Point 9	(s2)+19	R19	K30	
Point 10	(s2)+20	R20	K7	
	Point 1 Point 2 Point 3 Point 4 Point 5 Point 6 Point 7 Point 8 Point 9 Point 10 Point 1 Point 2 Point 3 Point 3 Point 4 Point 5 Point 6 Point 7 Point 8 Point 9 Point 8 Point 9 Point 9 Point 10	When R0 is specifie (s2) Point 1 (s2)+1 Point 2 (s2)+2 Point 3 (s2)+3 Point 4 (s2)+4 Point 5 (s2)+5 Point 6 (s2)+6 Point 7 (s2)+7 Point 8 (s2)+8 Point 9 (s2)+9 Point 10 (s2)+10 Point 1 (s2)+11 Point 2 (s2)+11 Point 3 (s2)+12 Point 4 (s2)+14 Point 5 (s2)+13 Point 4 (s2)+14 Point 5 (s2)+15 Point 6 (s2)+16 Point 7 (s2)+17 Point 8 (s2)+18 Point 9 (s2)+19 Point 9 (s2)+19 Point 9 (s2)+19	When R0 is specific in (s2) (s2) R0 Point 1 (s2)+1 R1 Point 2 (s2)+2 R2 Point 3 (s2)+3 R3 Point 4 (s2)+4 R4 Point 5 (s2)+5 R5 Point 6 (s2)+7 R7 Point 7 (s2)+8 R8 Point 8 (s2)+9 R9 Point 10 (s2)+10 R10 Point 1 (s2)+11 R11 Point 2 (s2)+12 R12 Point 3 (s2)+13 R13 Point 4 (s2)+14 R14 Point 5 (s2)+15 R15 Point 5 (s2)+16 R16 Point 6 (s2)+17 R17 Point 6 (s2)+18 R18 Point 7 (s2)+18 R18 Point 8 (s2)+19 R19 Point 9 (s2)+19 R19 Point 9 (s2)+19 R19 Point 9 <td>When R0 is specified in (s2)Set content$(s2)$R0K10Point 1$(s2)$+1R1K5Point 2$(s2)$+2R2K20Point 3$(s2)$+3R3K50Point 4$(s2)$+4R4K200Point 5$(s2)$+5R5K200Point 6$(s2)$+5R6K200Point 7$(s2)$+7R7K250Point 8$(s2)$+8R8K350Point 9$(s2)$+9R9K350Point 10$(s2)$+10R10K400Point 1$(s2)$+11R11K7Point 2$(s2)$+13R13K100Point 3$(s2)$+13R14K250Point 4$(s2)$+14R14K250Point 5$(s2)$+15R15K70Point 6$(s2)$+16R16K250Point 6$(s2)$+18R18K90Point 8$(s2)$+19R19K30Point 9$(s2)$+19R19K30Point 9$(s2)$+19R19K30</td>	When R0 is specified in (s2)Set content $(s2)$ R0K10Point 1 $(s2)$ +1R1K5Point 2 $(s2)$ +2R2K20Point 3 $(s2)$ +3R3K50Point 4 $(s2)$ +4R4K200Point 5 $(s2)$ +5R5K200Point 6 $(s2)$ +5R6K200Point 7 $(s2)$ +7R7K250Point 8 $(s2)$ +8R8K350Point 9 $(s2)$ +9R9K350Point 10 $(s2)$ +10R10K400Point 1 $(s2)$ +11R11K7Point 2 $(s2)$ +13R13K100Point 3 $(s2)$ +13R14K250Point 4 $(s2)$ +14R14K250Point 5 $(s2)$ +15R15K70Point 6 $(s2)$ +16R16K250Point 6 $(s2)$ +18R18K90Point 8 $(s2)$ +19R19K30Point 9 $(s2)$ +19R19K30Point 9 $(s2)$ +19R19K30

#1 Like points 4, 5, and 6, if the coordinates are specified by 3 points, the intermediate value could be the output value.

In this example, the output value (median value) is specified by the Y coordinate of point 5.

When the X coordinate is the same at 3 or more points, the value of the second point is also output.

#2 Like points 8 and 9, if the coordinates are specified by 2 points, the output value is the value of the Y coordinate of next point.

In this example, the output value is specified by the Y coordinate of point 9.

Error code	
------------	--

Error code	Content
4085H	When the specified device range for reading exceeds the range of the corresponding device.
4086H	When the specified device range for writing exceeds the range of the corresponding device.
4084H	When the Xn data of data table is not sorted in ascending order. However, the instruction will be executed until the position where the error occurs;
	When the input value specified in (s1) exceeds the range of the set scale conversion data;
	When the number of start coordinate points of device (s2) is less than 0.
Example	

扫描MA	IN ×					
0	SM100	1	[MOV	K5	RO	7
			[MOV	K-100	R1	}
			[MOV	KO	R2	}
			[MOV	KO	R3	}
			[MOV	KO	R4	}
			[MOV	K100	R5	}
			[MOV	K-52	R6	}
			[MOV	K-52	R6	}
			[MOV	K-2	R7	}
			[MOV	KO	R8	}
			[MOV	K2	R9	}
			[MOV	K52	R10	}
		SCL2	DO	RO	D100	}

$$\frac{1}{2}X - 2$$

When -100 ≤D0 (X) < 0, D100(Y)= When D0(X)=0, D100(Y)=0;



DSCL2/BIN 32-bit unit scale (X/Y coordinate data)

DSCL2(P)

The conversion data (32-bit data unit) for scaling specified in (s2) is scaled by the input value specified in (s1), and the operation result is stored in the device specified in (d).

-[DSCL2 (s1) (s2) (d)]

Content, range and data type

Parameter	Co	ontent			Rang	е		Dat	ta type			Data ty	vpe (lab	el)	
(s1)	Th sc nu sto	e input v aling or t mber of pring the	value fo the star the dev input v	r t 'ice alue	-2,147,483,648 to +2,147,483,647			Sig	Signed BIN 32 bit				ANY32_S		
(s2)	The start number of the device storing conversion data for scaling			of or	-			Signed BIN 32 bit				ANY32_S			
(d)	I) The start number of the device that stores the output value controlled by scaling		of the the olled	-			Sig	Signed BIN 32 bit			ANY32_S				
Device used															
Instruc Rer am @ev ic	es												Offse mod	et Pulse ifiœettension	
KnX	KnY	KnM	KnS	т	С	D	R	SD	LC	HSC	κ	н	[D]	ХХР	
DSCL2Parameer 1	•	•	•	•	•	•	•	•	•	•	•	•	•	•	
Parameter 2						•	•	•					•	•	
Parameter	•	•	•	•	•	•	•	•	•	•			•	•	

Features

3

The conversion data (32-bit data unit) for scaling specified in (s2) is scaled by the input value specified in (s1), and the operation result is stored in the device number specified in (d). The scale conversion is performed based on the scale conversion data stored after the device specified in (s2).

Set items (n represents the number of	f coordinate points specified in (s2))	Device allocation
Coordinate points		(s2)+1, (s2)
X coordinate	Point 1	(s2)+3, (s2)+2
	Point 2	(s2)+5, (s2)+4
	Point N	(s2)+2N+1, (s2)+2N
Y coordinate	Point 1	(s2)+2N+3, (s2)+2N+2
	Point 2	(s2)+2N+5, (s2)+2N+4
	Point N	(s2)+4N+1, (s2)+4N



• If the operation result is not an integer value, round the first digit below the decimal point.

• The X coordinate data of the conversion data for scaling should be set in ascending order.

- For (s1), set within the range of the conversion data for scaling ((s2), (s2) + 1 device value).
- If the same X coordinate is specified for multiple points, the Y coordinate value of the second point will be output.
- Set the number of coordinate points of conversion data for scaling within the range of 1 to 2,147,483,647.
- Setting example of conversion table for scaling.

In the case of scaling conversion characteristics as shown in the figure below, set it as the following data sheet.



Point 2	(s2)+5, (s2)+4	R5, R4	K20	
Point 3	(s2)+7, (s2)+6	R7, R6	K50	
Point 4	(s2)+9, (s2)+8	R9, R8	K200	Refer to #1
Point 5	(s2)+11, (s2)+10	R10, R11	K200	
Point 6	(s2)+13, (s2)+12	R13, R12	K200	
Point 7	(s2)+15, (s2)+14	R15, R14	K250	
Point 8	(s2)+17, (s2)+16	R17, R16	K350	Refer to #2
Point 9	(s2)+19, (s2)+18	R19, R18	K350	
Point 10	(s2)+21, (s2)+20	R21, R20	K400	
Point 1	(s2)+23, (s2)+22	R23, R22	K7	
Point 2	(s2)+25, (s2)+24	R25, R24	K30	
Point 3	(s2)+27, (s2)+26	R27, R26	K100	
Point 4	(s2)+29, (s2)+28	R29, R28	K25	Refer to #1
Point 5	(s2)+31, (s2)+30	R31, R30	K70	
Point 6	(s2)+33, (s2)+32	R33, R32	K250	
Point 7	(s2)+35, (s2)+34	R35, R34	K90	
Point 8	(s2)+37, (s2)+36	R37, R36	K90	Refer to #2
Point 9	(s2)+39, (s2)+38	R39, R38	K30	
Point 10	(s2)+41, (s2)+40	R41, R40	K7	
	Point 2 Point 3 Point 4 Point 5 Point 6 Point 7 Point 8 Point 9 Point 10 Point 10 Point 1 Point 2 Point 3 Point 3 Point 4 Point 5 Point 5 Point 6 Point 7 Point 8 Point 9 Point 9 Point 10	Point 2 $(s2)+5, (s2)+4$ Point 3 $(s2)+7, (s2)+6$ Point 4 $(s2)+9, (s2)+8$ Point 5 $(s2)+11, (s2)+10$ Point 6 $(s2)+13, (s2)+12$ Point 7 $(s2)+15, (s2)+14$ Point 8 $(s2)+17, (s2)+16$ Point 9 $(s2)+19, (s2)+18$ Point 10 $(s2)+21, (s2)+20$ Point 1 $(s2)+23, (s2)+22$ Point 2 $(s2)+25, (s2)+24$ Point 3 $(s2)+27, (s2)+26$ Point 4 $(s2)+29, (s2)+28$ Point 5 $(s2)+31, (s2)+30$ Point 6 $(s2)+33, (s2)+32$ Point 7 $(s2)+35, (s2)+34$ Point 8 $(s2)+37, (s2)+36$ Point 9 $(s2)+39, (s2)+38$ Point 10 $(s2)+41, (s2)+40$	Point 2 $(s2)+5, (s2)+4$ R5, R4Point 3 $(s2)+7, (s2)+6$ R7, R6Point 4 $(s2)+9, (s2)+8$ R9, R8Point 5 $(s2)+11, (s2)+10$ R10, R11Point 6 $(s2)+13, (s2)+12$ R13, R12Point 7 $(s2)+15, (s2)+14$ R15, R14Point 8 $(s2)+17, (s2)+16$ R17, R16Point 10 $(s2)+21, (s2)+20$ R21, R20Point 1 $(s2)+23, (s2)+22$ R23, R22Point 2 $(s2)+25, (s2)+24$ R25, R24Point 3 $(s2)+27, (s2)+26$ R27, R26Point 4 $(s2)+29, (s2)+28$ R29, R28Point 5 $(s2)+31, (s2)+30$ R31, R30Point 6 $(s2)+33, (s2)+32$ R33, R32Point 7 $(s2)+35, (s2)+34$ R35, R34Point 8 $(s2)+37, (s2)+36$ R37, R36Point 9 $(s2)+39, (s2)+38$ R39, R38Point 10 $(s2)+41, (s2)+40$ R41, R40	Point 2 $(s2)+5, (s2)+4$ R5, R4K20Point 3 $(s2)+7, (s2)+6$ R7, R6K50Point 4 $(s2)+9, (s2)+8$ R9, R8K200Point 5 $(s2)+11, (s2)+10$ R10, R11K200Point 6 $(s2)+13, (s2)+12$ R13, R12K200Point 7 $(s2)+15, (s2)+14$ R15, R14K250Point 8 $(s2)+17, (s2)+16$ R17, R16K350Point 9 $(s2)+19, (s2)+18$ R19, R18K350Point 10 $(s2)+21, (s2)+20$ R21, R20K400Point 1 $(s2)+23, (s2)+22$ R23, R22K7Point 2 $(s2)+25, (s2)+24$ R25, R24K30Point 3 $(s2)+27, (s2)+26$ R27, R26K100Point 4 $(s2)+29, (s2)+28$ R29, R28K25Point 5 $(s2)+31, (s2)+30$ R31, R30K70Point 6 $(s2)+33, (s2)+32$ R33, R32K250Point 7 $(s2)+35, (s2)+34$ R35, R34K90Point 8 $(s2)+37, (s2)+36$ R37, R36K90Point 9 $(s2)+39, (s2)+38$ R39, R38K30Point 10 $(s2)+41, (s2)+40$ R41, R40K7

#1 Like points 4, 5, and 6, if the coordinates are specified by 3 points, the intermediate value could be the output value.

In this example, the output value (median value) is specified by the Y coordinate of point 5.

When the X coordinate is the same at 3 or more points, the value of the second point is also output.

#2 Like points 8 and 9, if the coordinates are specified by 2 points, the output value is the value of the Y coordinate of the next point.

In this example, the output value is specified by the Y coordinate of point 9.

Error code

Error code	Content
4085H	When the specified device range for reading exceeds the range of the corresponding device.
4086H	When the specified device range for writing exceeds the range of the corresponding device.
4084H	When the Xn data of data table is not sorted in ascending order. However, the instruction will be executed until the position where the error occurs;
	When the input value specified in (s1) exceeds the range of the set scale conversion data;
	When the number of start coordinate points of device (s2) is less than 0.
Example	



ZONE/BIN 16-bit data zone control

ZONE(P)

After adding the offset value specified in (s1) or (s2) to the input value specified in (s3), it is stored in the device number specified in (d).

-[ZONE (s1) (s2) (s3) (d)]

Content, range and data type

Parameter	Content	Range	Data type	Data type (label)
s1	The negative offset value for addition in the input value	-32,768 to 32,767	BIN16 bit	ANY16_S
s2	The positive offset value for addition in the input value	-32,768 to 32,767	BIN16 bit	ANY16_S
s3	Input value for zone control`	-32,768 to 32,767	BIN16 bit	ANY16_S
d	The start number of the device storing the output value controlled by zone control	-	BIN16 bit	ANY16_S

Device used

Instruc	tRarameteevic	es										Offse modi	et Pulse ficaetxioeension
	KnX	KnY	KnM	KnS	т	С	D	R	SD	к	н	[D]	ХХР
ZONE	Paramet ● 1	•	•	•	•	•	•	٠	•	•	•	•	•
	Paramet ● 2	•	•	•	•	٠	٠	٠	•	•	•	•	•
	Paramet ● 3	•	•	•	•	•	•	•	•			•	•
	Parameter 4	•	•	•	•	•	•	•	•			•	•

Features

After adding the offset value specified in (s1) or (s2) to the input value (BIN 16-bit value) specified in (s3), it is stored in the device number specified in (d). The offset value is controlled as follows.

Condition	The value stored in the output value
When input value (s3)<0	Input value (s3) + negative offset value (s1)
When input value (s3)=0	0
When input value (s3)>0	Input value (s3) + positive offset value (s2)

• When the output value stored in (d) is a signed BIN 16-bit value, and the operation result exceeds the range of -32,768 to 32,767, the situation is shown in the following example.

For example, when (s1) is -100 and (s3) is -32,768,

the output value = -32768+(-100)=8000H-FF9CH=7F9CH=32668.



Error code

Error code

Example

4085H

4086H

Content

When the specified device range for reading exceeds the range of the corresponding device

When the specified device range for writing exceeds the range of the corresponding device



When X000 is ON

- When D0<0, the value of (D0)+(-1,000) is stored in D1.
- When D0=0, 0 is stored in D1.
- When 0<D0, the value of (D0)+(1,000) is stored in D1.

DZONE/BIN 32-bit data zone control

DZONE(P)

After adding the offset value specified in (s1) or (s2) to the input value specified in (s3), it is stored in the device number specified in (d).

-[DZONE (s1) (s2) (s3) (d)]

Content, range and data type

Parameter Content			Range			Dat	Data type				Data type (label)						
(s1)		Th val inp	The negative offset value for addition in the input value			-2147483648 to 2147483647		BIN	BIN32 bit			ANY32_S					
(s2)		The positive offset value for addition in the input value				-2147483648 to 2147483647			BIN	BIN32 bit				ANY32_S			
(s3)		Inp coi	Input value for zone control				-2147483648 to 2147483647			BIN32 bit				ANY32_S			
(d)		The start number of the device storing the output value controlled by zone control				-			BIN	BIN32 bit			ANY32_S				
Dev	ice used																
Instru	c Hər am @ev ic	es												Offse mod	et Pulse ificeattension		
	KnX	KnY	KnM	KnS	т	С	D	R	SD	LC	HSC	κ	н	[D]	ХХР		
DZON	₽arame€r 1	•	•	•	•	•	•	•	•	•	•	•	•	•	•		
	Parameer 2	•	•	•	•	•	•	•	•	•	•	•	•	•	•		
	Parameer 3	•	•	•	•	•	•	•	•	•	•			•	•		
	Parameter 4	•	•	•	•	•	٠	•	•	•	•			•	•		

Features

After adding the offset value specified in (s1) or (s2) to the input value (BIN 32-bit value) specified in (s3), it is stored in the device number specified in (d). The offset value is controlled as follows.

Condition	The value stored in the output value
When input value ((s3), (s3)+1)<0	Input value ((s3), (s3)+1) + negative offset value (s1), (s1)+1
When input value ((s3), (s3)+1)=0	0
When input value ((s3), (s3)+1)>0	Input value ((s3), (s3)+1) + positive offset value (s2), (s2)+1

• When the output value stored in (d) and (d)+1 is a signed BIN 32-bit value, and the operation result exceeds the range of -2,147,483,648 to 2,147,483,647, the situation is shown in the following example.

For example, (s1), (s1)+1 is -1,000, (s3), (s3)+1 is -2,147,483,648, then the output value=-2,147,483,648+(-1000)=80000000H+FFFFFC18H=2,147,482,648.



Error code

Error code

4085H

4086H

Example

Content

When the specified device range for reading exceeds the range of the corresponding device

When the specified device range for writing exceeds the range of the corresponding device



• When (D1, D0)<0, the value of (D1, D0)+(-10,000) is stored in (D11, D10).

- When (D1, D0)=0, 0 is stored in (D11, D10).
- When 0<(D1, D0), the value of (D1, D0)+10,000 is stored in (D11, D10).