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Logic panel

LP Series

Instruction Manual

LP Series

Thank you very much for selecting Autonics products.

For your safety, please read the following before using.

Preface

Thank you very much for selecting Autonics products.

This user manual contains information about the product and its proper use, and should be kept in a place where it will be easy to access.

LP series Instruction Manual Guide

- Please familiarize yourself with the information in this manual before using the product.
- This manual provides detailed information on the product's features. It does not offer any guarantee concerning matters beyond the scope of this manual.
- This manual may not be edited or reproduced in either part or whole without permission.
- This programming manual is not provided as part of the product package. Please visit our home-page (www.autonics.com) to download a copy.
- The manual's content may vary depending on changes to the product's software and other unforeseen developments within Autonics, and is subject to change without prior notice. Upgrade notice is provided through our homepage.
- We contrived to describe this manual more easily and correctly. However, if there are any corrections or questions, please notify us these on our homepage.

LP series Instruction Manual Symbols

Symbol	Description
Note	Supplementary information for a particular feature.
Warning	Failure to follow instructions can result in serious injury or death.
Caution	Failure to follow instructions can lead to a minor injury or product damage.
Ex.	An example of the concerned feature's use.
※1	Annotation mark.

※The specifications and dimensions of this manual are subject to change without any notice.

Table of Contents

1 Structures of instruction name

The structure of instruction name is divided into three parts and each part represents data type, instruction name, and data processing method respectively. The data type is usually located in front of instruction name, and the data processing method is located after the instruction name(Limited to a few of them).

1.1 Structure by data type

(1) By data size

1) Bit data type instruction

   It has an instruction structure of Bxxxx after Bit's B.
   Ex) **B**MOV, **B**MO**VL, B**MOVG …. etc.

2) Nibble data type instruction (4bit)

   It has an instruction structure of Nxxxx after Nibble's N.

3) Half word data type instruction (8bit)

   It has an instruction structure of Hxxxx after Half Word's H.

4) Word data type instruction (1word)

   It has an instruction structure of xxxx without Word name.
   Ex) MOV, MOVL, MOVG …. etc.

5) Double word data instruction (2word)

   It has an instruction structure of Dxxx after Double word's D.
   Ex) **D**MOV, **D**MOVL, **D**MOVG …. etc.

6) User-defined data type instruction

   It has an instruction structure of Axxxx, after Any bit's A.
   Ex) **A**OR, **A**AND, **A**XOR, …. etc.

(2) By data sign

There are signed and unsigned data types, and the former is typically used with omitting its name. On the other hand, the latter is used with "U" and "U" is positioned in the far last part of the instruction name.
If there is name according to data processing, in case of (xxxL, xxxG) it is placed to the back For further details, refer to '1.2 Structure by data processing'.

- If there is no data processing method part: MUL**U**, ADD**U**, SUB**U**, ….. etc.
- If there is a data processing method part: MULL**U**, ADDL**U**, SUBL**U** ….. etc.

(3) By BCD data

BCD data has an instruction structure of xxxB after BCD's B.
Be sure that the data processing method part(List, Group) is always positioned after the BCD part.

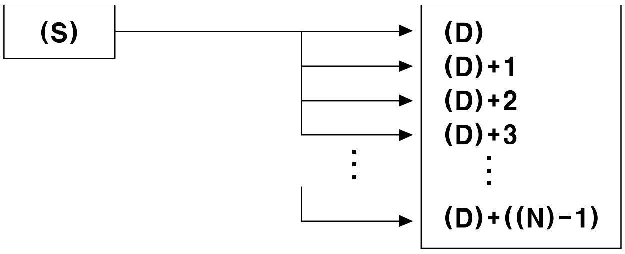
- If there is no data processing method name.(1 : 1 process): ADD**B**, MUL**B**, SUB**B**, ….. etc.
- If the data processing method name is 'List': ADD**B**L, MUL**B**L, SUB**B**L, …. etc.

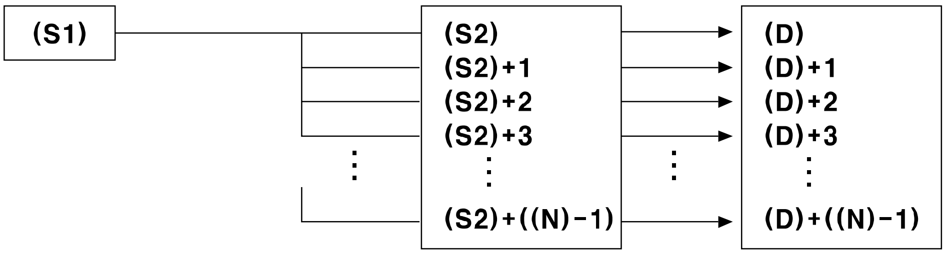
1.2 Structure by data processing

(1) 1:1 processing instruction

It has an instruction structure of xxx with omitting the name.
Ex) MOV, …

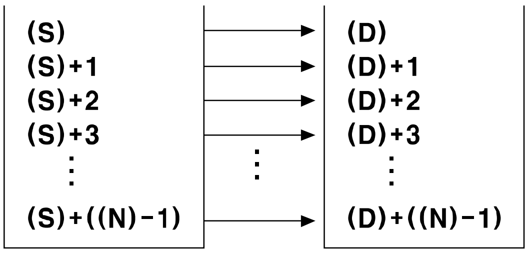
(2) 1:N processing instruction





It has an instruction structure of xxxL after List's "L".
Ex) MOVL, ….

(3) N:N processing instruction



It has an instruction structure of xxxG after Group's "G".
Ex) MOVG, …

Note

Operand

- S: Represents source device
- D: Represents destination device
- N: Represents the number of devices

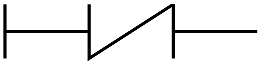
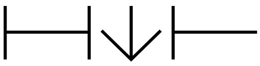
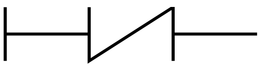
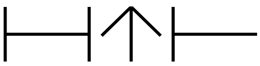
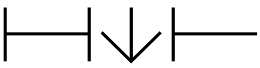
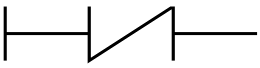
2 Instruction

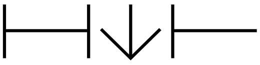
2.1 Basic instruction list

2.1.1 Non processing instruction

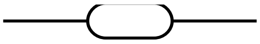
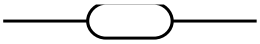
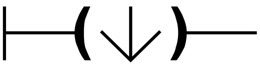
Instruction	Ladder symbol	Step	Page
NOP		1	37

2.1.2 Contact instruction

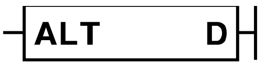
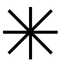
Instruction	Ladder symbol	Step	Page
LOAD		1	38
LOADN		1	39
LOADP		2	40
LOADF		2	41
AND		1	42
ANDN		1	43
ANDP		2	44
ANDF		2	45
ANDL		1	46
OR		1	47
ORN		1	48

Instruction	Ladder symbol	Step	Page
ORP		2	49
ORF		2	50
ORL		1	51

2.1.3 Output instruction

Instruction	Ladder symbol	Step	Page
OUT		1	52
OUT Syyy.xx		1	53
OUTP		2	54
OUTF		2	55
SET		1	56
SET Syyy.xx		1	57
RST		1	58

2.1.4 Reversal instruction

Instruction	Ladder symbol	Step	Page
ALT		3	59
NOT		1	60

2.1.5 Stack instruction

Instruction	Ladder symbol	Step	Page
MPUSH		1	61
MLOAD		1	62
MPOP		1	63

2.1.6 Exit instruction

Instruction	Ladder symbol	Step	Page
END	END	1	64

2.2 Application instruction

2.2.1 Counter instruction

Instruction	Ladder symbol	Step	Page
CTU	U CTU S R<S> N	5	65
CTD	D CTU S R<S> N	5	66
CTUD	D CTUD S D R<S> N	5	67
CTR	U CTR S R<S> N	5	68

2.2.2 Timer instruction

Instruction	Ladder symbol	Step	Page
TON	TON S N	5	69
TOFF	TOFF S N	5	70
TMR	TMR S N	5	71
TMON	TMON S N	5	72
TRTG	TRTG S N	5	73

2.2.3 Control instruction

Instruction	Ladder symbol	Step	Page
JMP	JMP LABEL	3	74
LABEL	LABEL Label name	3	75
FCALL	FCALL LABEL	3	76

Instruction	Ladder symbol	Step	Page
FUNC	FUNC LABEL	3	77

2.2.4 Branch instruction

Instruction	Ladder symbol	Step	Page
CALL	CALL LABEL	3	78
SUBRT	SUBRT LABEL	3	79
RET	RET	1	80

2.2.5 Loop instruction

Instruction	Ladder symbol	Step	Page
FOR	FOR N	3	81
NEXT	NEXT	1	82
BREAK	BREAK	1	83

2.2.6 Master control instruction

Instruction	Ladder symbol	Step	Page
MCS	MCS N	2	84
MCR	MCR N	2	85

2.2.7 Interrupt instruction

Instruction	Ladder symbol	Step	Page
EI	EI	1	86
DI	DI	1	87

Instruction	Ladder symbol	Step	Page
ETI	ETI N	1	88
EEI	EEI N	1	89
DTI	DTI N	1	90
DEI	DEI N	1	91
TINT	TINT N	1	92
EINT	EINT N	1	93
IRET	IRET	1	94

2.2.8 Watchdog timer

Instruction	Ladder symbol	Step	Page
WDT	WDT	1	95

2.2.9 Input comparison instruction

Instruction	Ladder symbol	Step	Page
LOAD=	= S1 S2	5	96
LOAD>	> S1 S2	5	97
LOAD<	< S1 S2	5	98
LOAD<>	<> S1 S2	5	99
LOAD>=	>= S1 S2	5	100

Instruction	Ladder symbol	Step	Page
LOAD<=	<= S1 S2	5	101
DLOAD=	= S1 S2	5	102
DLOAD>	> S1 S2	5	103
DLOAD<	< S1 S2	5	104
DLOAD<>	< > S1 S2	5	105
DLOAD>=	>= S1 S2	5	106
DLOAD<=	<= S1 S2	5	107
AND=	= S1 S2	5	108
AND>	> S1 S2	5	109
AND<	< S1 S2	5	110
AND<>	< > S1 S2	5	111
AND>=	>= S1 S2	5	112
AND<=	<= S1 S2	5	113
DAND=	= S1 S2	5	114
DAND>	> S1 S2	5	115

Instruction	Ladder symbol	Step	Page
DAND<	< S1 S2	5	116
DAND<>	<> S1 S2	5	117
DAND>=	>= S1 S2	5	118
DAND<=	<= S1 S2	5	119
OR=	= S1 S2	5	120
OR>	> S1 S2	5	121
OR<	< S1 S2	5	122
OR<>	<> S1 S2	5	123
OR>=	>= S1 S2	5	124
OR<=	<= S1 S2	5	125
DOR=	= S1 S2	5	126
DOR>	> S1 S2	5	127
DOR<	< S1 S2	5	128
DOR<>	<> S1 S2	5	129
DOR>=	>= S1 S2	5	130

Instruction	Ladder symbol	Step	Page
DOR<=	<= S1 S2	5	131

2.2.10 Comparison instruction

Instruction	Ladder symbol	Step	Page
CMP	CMP S1 S2 D	7	132
DCMP	DCMP S1 S2 D	7	133
ACMP	ACMP S1 S2 D N	7	134
CMPL	CMPL S1 S2 D N	9	135
DCMPL	DCMPL S1 S2 D N	9	136
BWCMP	BWCMP S1 S2 D N	9	137
DBWCMP	DBWCMP S1 S2 D N	9	139

2.2.11 Transmission instruction

Instruction	Ladder symbol	Step	Page
BMOV	BMOV S D	5	141
MOV	MOV S D	5	142
DMOV	DMOV S D	5	143
BMOVL	BMOVL S D N	7	144
MOVL	MOVL S D N	7	145

Instruction	Ladder symbol	Step	Page
DMOVL	DMOVL S D N	7	146
BMOVG	BMOVG S D N	7	147
MOVG	MOVG S D N	7	148
DMOVG	DMOVG S D N	7	149
BCMOV	BCMOV S D	5	150
CMOV	CMOV S D	5	151
DCMOV	DCMOV S D	5	152

2.2.12 Exchange instruction

Instruction	Ladder symbol	Step	Page
XCH	XCH S D	5	153
DXCH	DXCH S1 S2	5	154
AXCH	AXCH S1 S2 N	7	155
SWAP	SWAP D	3	156
DSWAP	DSWAP D	3	157

2.2.13 Rotation instruction

Instruction	Ladder symbol	Step	Page
ROR	ROR S C	5	158
DROR	DROR S C	5	159
AROR	AROR S N C	7	160
RORC	RORC S C	5	161
DRORC	DRORC S C	5	162
ARORC	AROSC S N C	7	163
ROL	ROL S C	5	164
DROL	DROL S C	5	165
AROL	AROL S N C	7	166
ROLC	ROLC S C	5	167
DROLC	DROLC S C	5	168
AROLC	AROLC S N C	7	169

2.2.14 Movement instruction

Instruction	Ladder symbol	Step	Page
SFTR	SFTR S N	9	170
ASFTR	ASFTR S N1 N2	9	171
SFTL	SFTL S N1 N2	9	172
ASFTL	ASFTL S N1 N2	9	173
WSFTR	WSFTR S N1 N2	9	174
WSFTL	WSFTL S N1 N2	9	175

2.2.15 Arithmetic operation instruction

Instruction	Ladder symbol	Step	Page
ADD	ADD S1 S2 D	7	176
DADD	DADD S1 S2 D	7	177
ADDU	ADDU S1 S2 D	7	178
DADDU	DADDU S1 S2 D	7	179
ADDL	ADDL S1 S2 D N	9	180
DADDL	DADDL S1 S2 D N	9	181
ADDLU	ADDLU S1 S2 D N	9	182
DADDLU	DADDLU S1 S2 D N	9	183

Instruction	Ladder symbol	Step	Page
SUB	SUB S1 S2 D	7	184
DSUB	DSUB S1 S2 D	7	185
SUBU	SUBU S1 S2 D	7	186
DSUBU	DSUBU S1 S2 D	7	187
SUBL	SUBL S1 S2 D N	9	188
DSUBL	DSUBL S1 S2 D N	9	189
SUBLU	SUBLU S1 S2 D N	9	190
DSUBLU	DSUBLU S1 S2 D N	9	191
MUL	MUL S1 S2 D	7	192
DMUL	DMUL S1 S2 D	7	193
MULU	MULU S1 S2 D	7	194
DMULU	DMULU S1 S2 D	7	195
MULL	MULL S1 S2 D N	9	196
DMULL	DMULL S1 S2 D N	9	197
MULLU	MULLU S1 S2 D N	9	198

Instruction	Ladder symbol	Step	Page
DMULLU	DMULLU S1 S2 D N	9	199
DIV	DIV S1 S2 D	7	200
DDIV	DDIV S1 S2 D	7	201
DIVU	DIVU S1 S2 D	7	202
DDIVU	DDIVU S1 S2 D	7	203
DIVL	DIVL S1 S2 D	9	204
DDIVL	DDIVL S1 S2 D N	9	204
DIVLU	DIVLU S1 S2 D N	9	206
DDIVLU	DDIVLU S1 S2 D N	9	207
INC	INC D	3	208
DINC	DINC D	3	209
DEC	DEC D	3	210
DDEC	DDEC D	3	211
ADDB	ADDB S1 S2 D	7	212
DADDB	DADDB S1 S2 D	7	213

Instruction	Ladder symbol	Step	Page
ADDBL	ADDBL S1 S2 D N	9	214
DADDBL	DADDBL S1 S2 D N	9	215
SUBB	SUBB S1 S2 D N	7	216
DSUBB	DSUBB S1 S2 D	7	217
SUBBL	SUBBL S1 S2 D	9	218
DSUBBL	SUBBL S1 S2 D	9	219
MULB	MULB S1 S2 D	7	220
DMULB	DMULB S1 S2 D	7	221
MULBL	MULBL S1 S2 D N	9	222
DMULBL	DMULBL S1 S2 D N	9	223
DIVB	DIVB S1 S2 D	7	224
DDIVB	DDIVB S1 S2 D	7	225
DIVBL	DIVBL S1 S2 D N	9	226
DDIVBL	DDIVBL S1 S2 D N	9	227
INCB	INCB D	3	228

Instruction	Ladder symbol	Step	Page
DINCB	DINCB D	3	229
DECB	DECB D	3	230
DDECB	DDECB D	3	231

2.2.16 Logical operation instruction

Instruction	Ladder symbol	Step	Page
WAND	WAND S1 S2 D	7	232
DAND	DAND S1 S2 D	7	233
AAND	AAND S1 S2 D N	9	234
WANDL	WANDL S1 S2 D N	9	235
DANDL	DANDL S1 S2 D N	9	236
WOR	WOR S1 S2 D	7	237
DOR	DOR S1 S2 D	7	238
AOR	AOR S1 S2 D	9	239
WORL	WORL S1 S2 D	9	240
DORL	DORL S1 S2 D N	9	241
XOR	XOR S1 S2 D	7	242

Instruction	Ladder symbol	Step	Page
DXOR	DXOR S1 S2 D	7	243
AXOR	AXOR S1 S2 D N	9	244
XORL	XORL S1 S2 D N	9	245
DXORL	DXORL S1 S2 D N	9	246
XNR	XNR S1 S2 D	7	247
DXNR	DXNR S1 S2 D	7	248
AXNR	AXNR S1 S2 D N	9	249
XNRL	XNRL S1 S2 D N	9	250
DXNRL	DXNRL S1 S2 D N	9	251

2.2.17 BIN/BCD instruction

Instruction	Ladder symbol	Step	Page
BIN2BCD	BIN2BCD S D	5	252
DBIN2BCD	DBIN2BCD S D	5	253
BCD2BIN	BCD2BIN S D	5	254
DBCD2BIN	DECD2BIN S D	5	255

2.2.18 String conversion instruction

Instruction	Ladder symbol	Step	Page
BIN2HASC	BIN2HASC S D	5	256
DBIN2HASC	DBIN2HASC S D	5	257
HASC2BIN	HASC2BIN S D	5	258
DHASC2BIN	DHASC2BIN S D	5	259
BCD2DASC	BCD2DASC S D	5	260
DBCD2DASC	DBCD2DASC S D	5	261
DASC2BIN	DASC2BIN S D	5	262
DDASC2BIN	DDASC2BIN S D	5	263
STR2ASC	STR2ASC S D	7	264
DASC2BCD	DASC2BCD S D	5	265
DDASC2BCD	DDASC2BCD S D	5	266
BIN2DASC	BIN2DASC S D	5	267
DBIN2DASC	DBIN2DASC S D	5	268

2.2.19 Code conversion instruction

Instruction	Ladder symbol	Step	Page
GRY2BIN	GRY2BIN S D	5	269
DGRY2BIN	DGRY2BIN S D	5	270
BIN2GRY	BIN2GRY S D	5	271
DBIN2GRY	DBIN2GRY S D	5	272

2.2.20 Sign reversal instruction

Instruction	Ladder symbol	Step	Page
NEG	NEG D	3	273
DNEG	DNEG D	3	274

2.2.21 Data conversion instruction

Instruction	Ladder symbol	Step	Page
DECO	DECO S D N	7	275
ENCO	ENCO S D N	7	276
EXT	EXT D	3	277

2.2.22 Refresh instruction

Instruction	Ladder symbol	Step	Page
REF	REF D N	5	278

2.2.23 Display instruction

Instruction	Ladder symbol	Step	Page
SEG	SEG S D N	7	279

2.2.24 Clock instruction

Instruction	Ladder symbol	Step	Page
TCMP	TCMP S1 S2 S3 S4 D	7	281
TADD	TADD S1 S2 D	7	282
TSUB	TSUB S1 S2 D	7	283
TRD	TRD D	3	284
TWR	TWR D	3	285
HOUR	HOUR S D1 D2	7	286
TZCP	TZCP S1 S2 S3 D	9	287

2.2.25 Motion instruction

Instruction	Ladder symbol	Step	Page
MTVDM	MTVDM S0 S1 S2 S3 S4 S5	9	289
MTPDM	MTPDM S0 S1 S2 S3 S4 S5	9	289
MTIDM	MTIDM S0 S1	5	290
MTMEC	MTMEC S0	5	292
MTEMS	MTEMS S0	5	293
MTCPP	MTCPP S0 S1	5	294
MTFOS	MTFOS S0	5	295
MTSRS	MTSRS S0	5	296

Instruction	Ladder symbol	Step	Page
MTOBC	MTOBC S0	5	297
MTOVV	MTOVV S0 S1	5	299
MTOVP	MTOVP S0 S1	5	300
MTIPT	MTIPT S0 S1 S2 S3	7	301
MTUAI	MTUAI S0 S1	5	302

3 Instruction Description

3.1 Basic instruction

3.1.1 Non processing instruction (NOP)

Non processing instruction	NOP	Applicable model LP-S044, LP-S070

1. It is non processing instruction.
2. It is available only for mnemonic program.

3.1.2 Contact instruction(LOAD)

Contact instruction	LOAD	S	Applicable model LP-S044, LP-S070

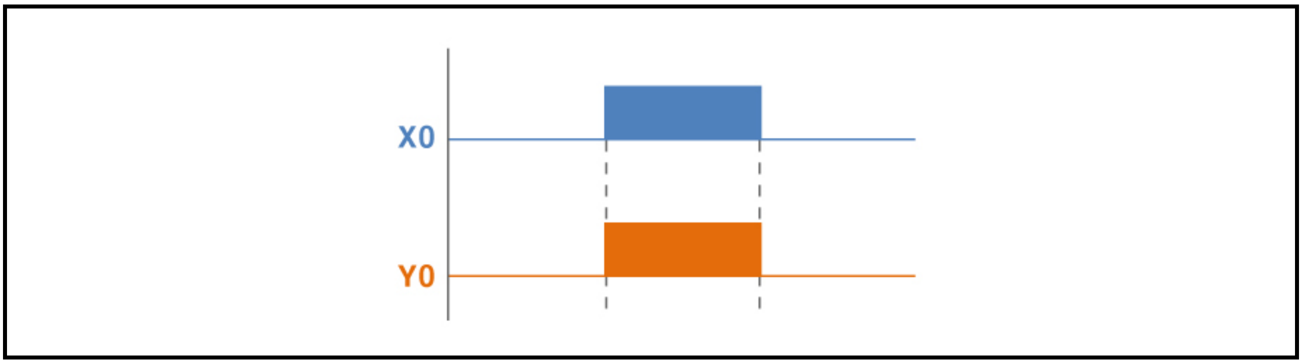
OP	DATA type	Available device / Description / Range
S	BIT	X, Y, M, S, T, C, F, UB
		Contact of bit device
		Not applicable

Error	Zero	Carry	Borrow	Step
				1

<Ladder>

When the contact(S) is ON, the corresponding output bit becomes 1.

<Time chart>

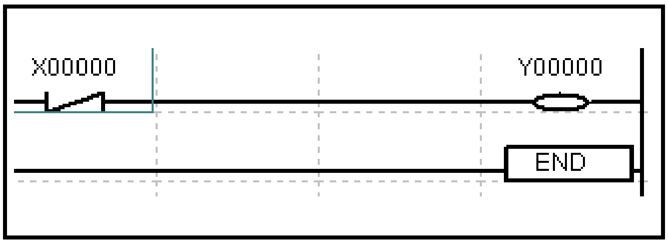


3.1.3 Contact instruction(LOADN)

Contact instruction	LOADN	S	Applicable model LP-S044, LP-S070

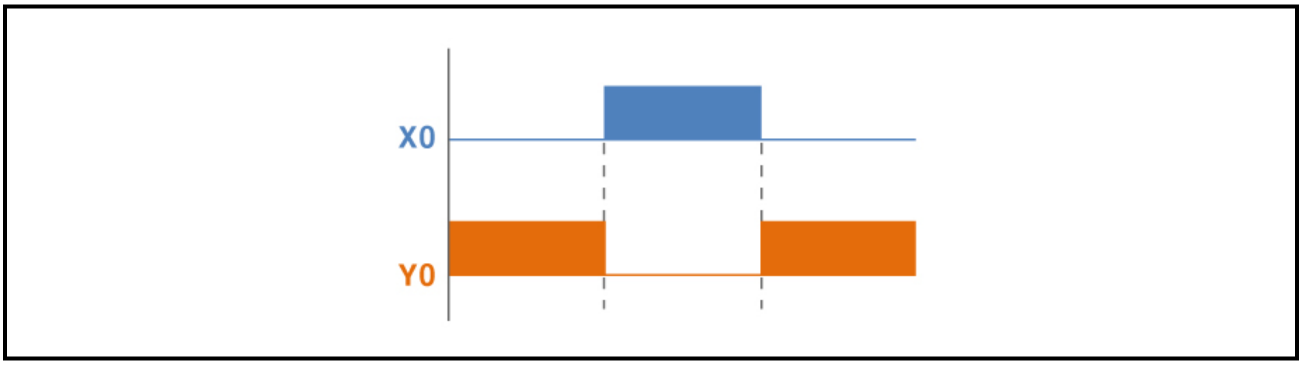
OP	DATA type	Available device / Description / Range	Error	Zero	Carry	Borrow	Step
S	BIT	X, Y, M, S, T, C, F, UB					
		Contact of bit device					
		Not applicable					1

<Ladder>



When the (S) bit turns OFF from ON, the operation result becomes ON from OFF.

<Time chart>



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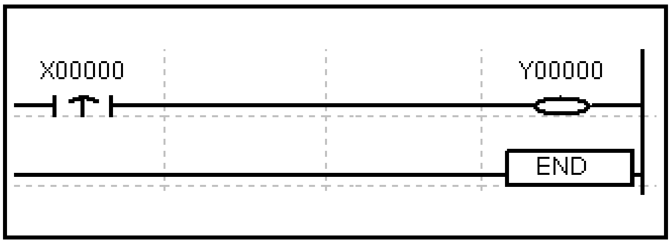
3.1.4 Contact instruction(LOADP)

Contact instruction	LOADP	S	Applicable model LP-S044, LP-S070

OP	DATA type	Available device / Description / Range
S	BIT	X, Y, M, S, T, C, F, UB
		Contact of bit device
		Not applicable

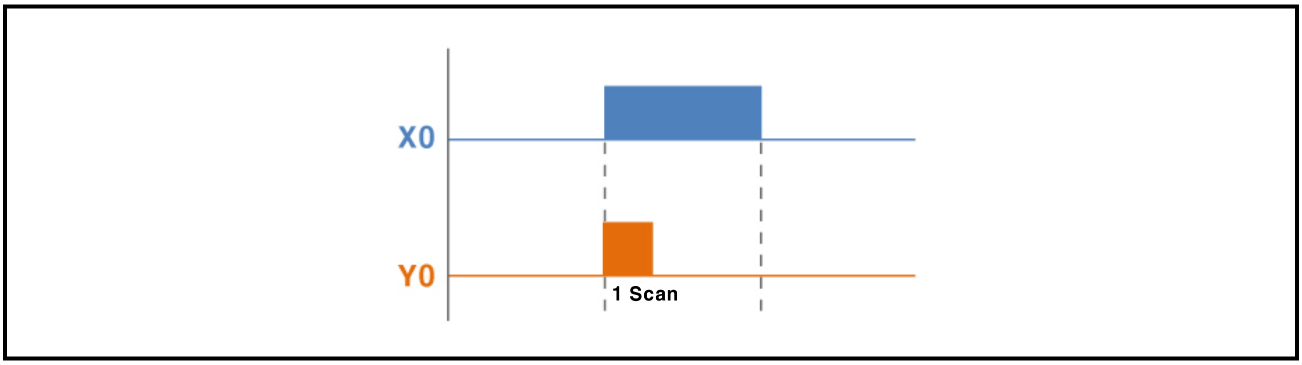
Error	Zero	Carry	Borrow	Step
				2

<Ladder>



As soon as the (S) contact turns ON from OFF, the operation result becomes ON.

<Time chart>



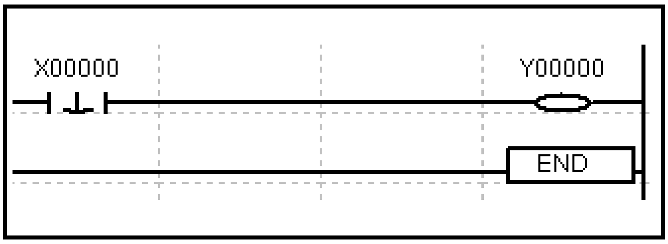
3.1.5 Contact instruction(LOADF)

Contact instruction	LOADF	S	Applicable model LP-S044, LP-S070

OP	DATA type	Available device / Description / Range
S	BIT	X, Y, M, S, T, C, F, UB
		Contact of bit device
		Not applicable

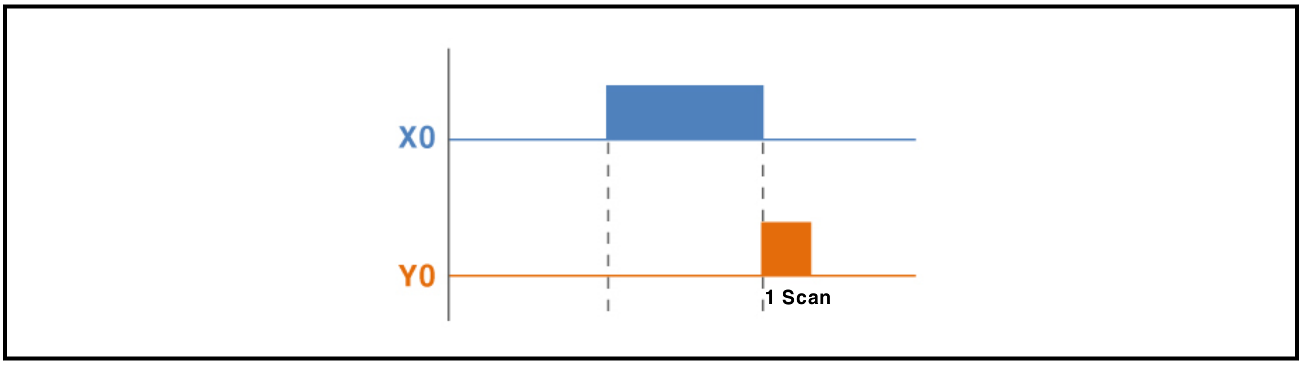
Error	Zero	Carry	Borrow	Step
				2

<Ladder>



As soon as the (S) contact turns OFF from ON, the operation result becomes ON.

<Time chart>

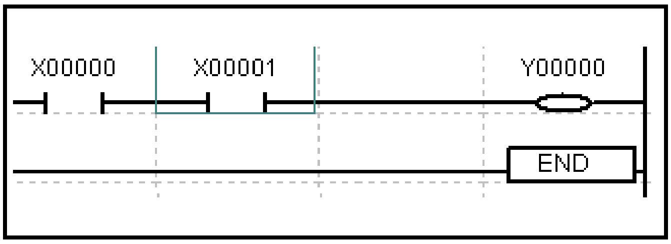


3.1.6 Contact instruction(AND)

Contact instruction	AND	S	Applicable model LP-S044, LP-S070

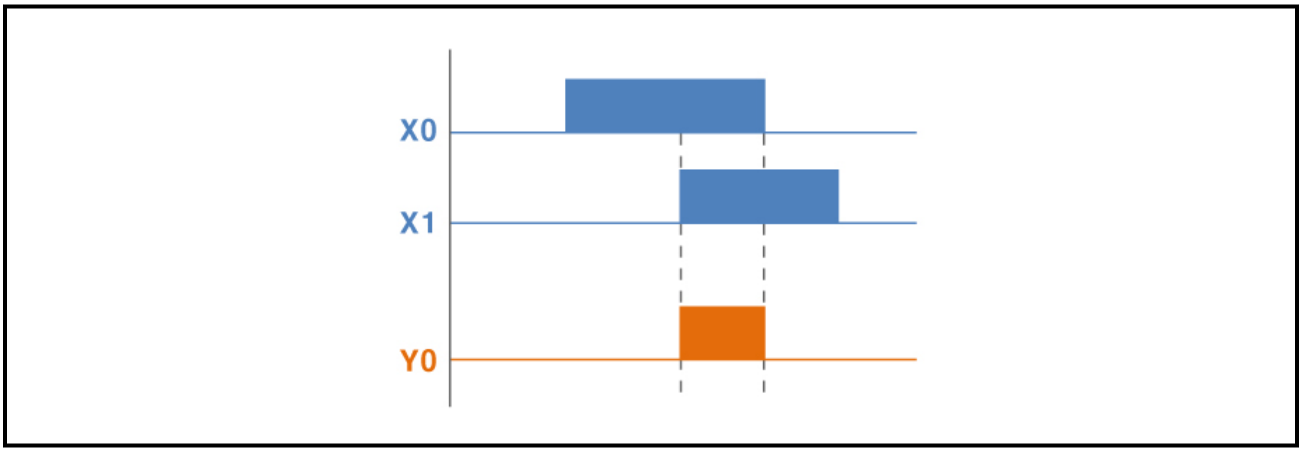
OP	DATA type	Available device / Description / Range	Error	Zero	Carry	Borrow	Step
S	BIT	X, Y, M, S, T, C, F, UB					
		Contact of bit device					
		Not applicable					1

<Ladder>



Executes AND operation between the previous operation result and the designated contact(S), and considers it as the operation result.

<Time chart>



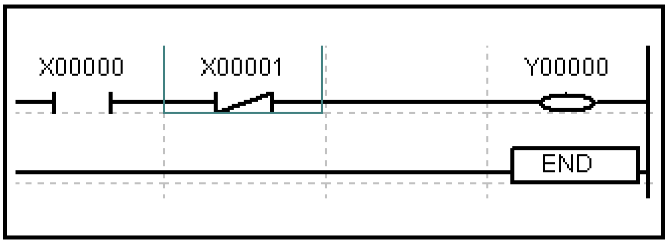
3.1.7 Contact instruction(ANDN)

Contact instruction	ANDN	S	Applicable model LP-S044, LP-S070

OP	DATA type	Available device / Description / Range
S	BIT	X, Y, M, S, T, C, F, UB
		Contact of bit device
		Not applicable

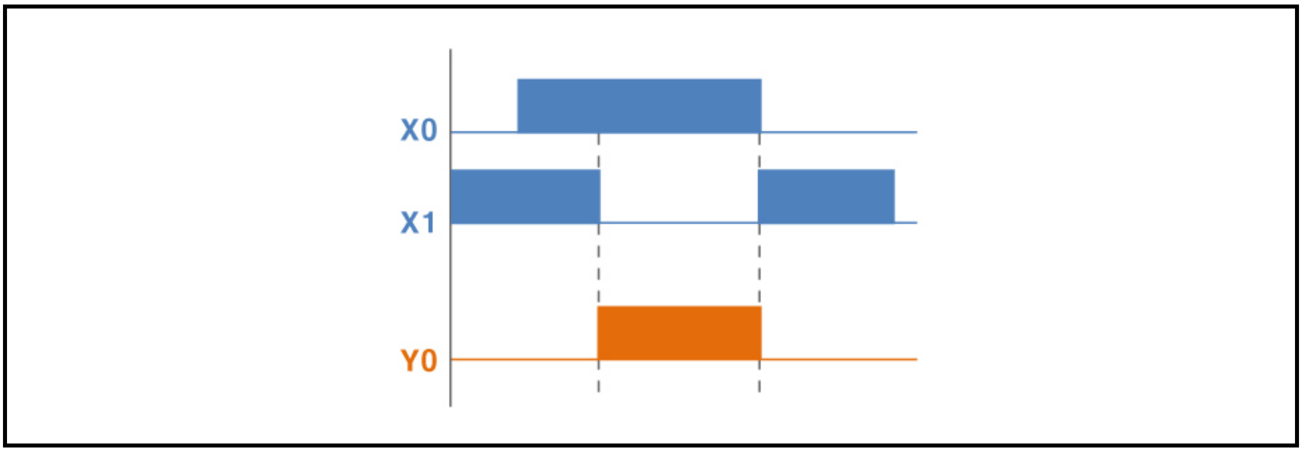
Error	Zero	Carry	Borrow	Step
				1

<Ladder>



Executes AND NOT operation between the previous operation result and the designated contact(S), and considers it as the operation result.

<Time chart>

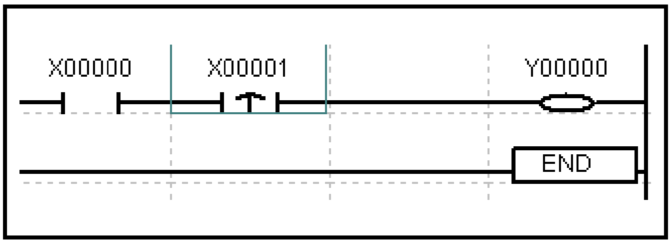


3.1.8 Contact instruction(ANDP)

Contact instruction	ANDP	S	Applicable model LP-S044, LP-S070

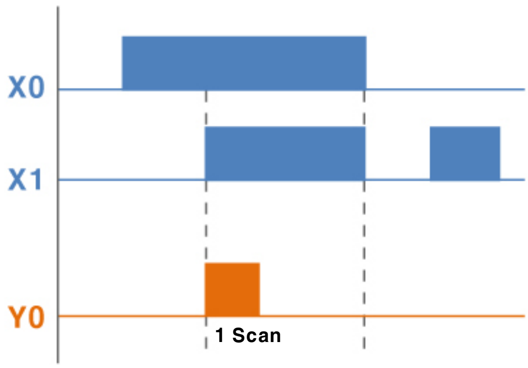
OP	DATA type	Available device / Description / Range	Error	Zero	Carry	Borrow	Step
S	BIT	X, Y, M, S, T, C, F, UB					
		Contact of bit device					
		Not applicable					2

<Ladder>



On the rising edge of a pulse, it executes AND operation between the previous operation result and the designated contact(S), and considers it as the operation result.

<Time chart>

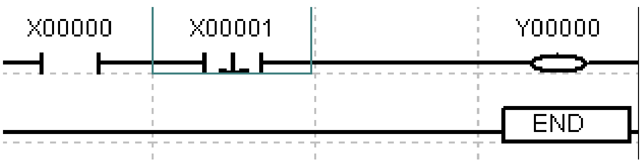


3.1.9 Contact instruction(ANDF)

Contact instruction	ANDF	S	Applicable model LP-S044, LP-S070

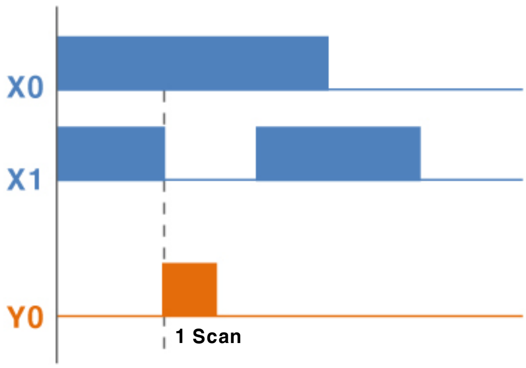
OP	DATA type	Available device / Description / Range	Error	Zero	Carry	Borrow	Step
S	BIT	X, Y, M, S, T, C, F, UB					
		Contact of bit device					
		Not applicable					2

<Ladder>



On the falling edge of a pulse, it executes AND operation between the previous operation result and the designated contact(S), and considers it as the operation result.

<Time chart>



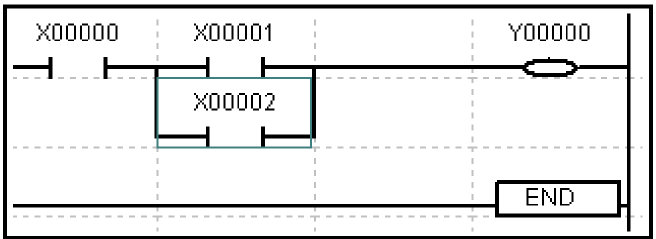
3.1.10 Contact instruction(ANDL)

Contact instruction	ANDL	Applicable model LP-S044, LP-S070

<Mnemonic & Ladder>

Step	Instruction	OP1	OP2
0	LOAD	X00000	
1	LOAD	X00001	
2	OR	X00002	
3	ANDL		
4	OUT	Y00000	
5	END		

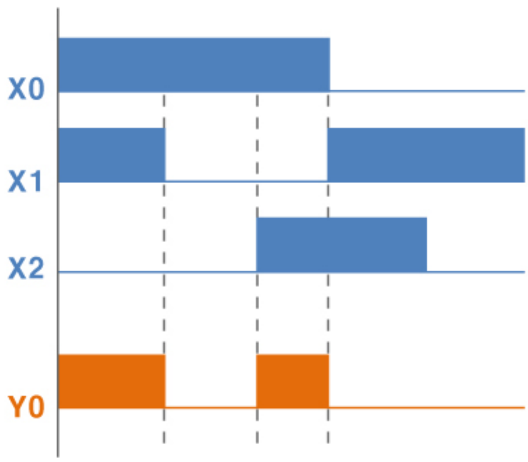
Executes the AND operation between the block and the block.



[Note]

- You cannot add as device input in ladder.
- Input for instruction is available only for mnemonic.

<Time chart>

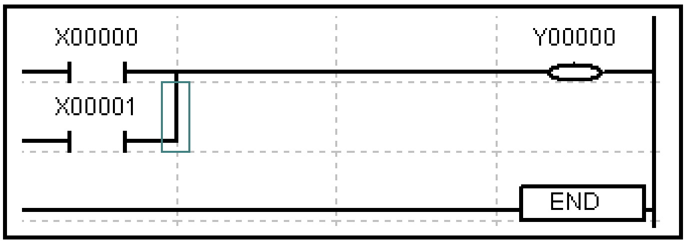


3.1.11 Contact instruction(OR)

Contact instruction	OR	S	Applicable model LP-S044, LP-S070

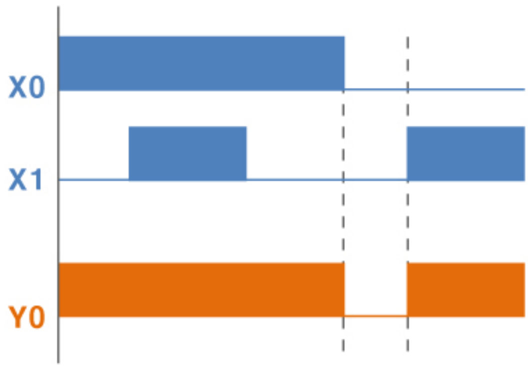
OP	DATA type	Available device / Description / Range	Error	Zero	Carry	Borrow	Step
S	BIT	X, Y, M, S, T, C, F, UB					
		Contact of bit device					
		Not applicable					1

<Ladder>



Executes the OR operation between the previous operation result and the designated contact(S), and considers it as the operation result.

<Time chart>



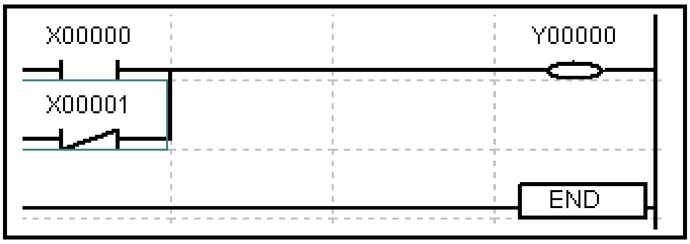
3.1.12 Contact instruction(ORN)

Contact instruction	ORN	S	Applicable model LP-S044, LP-S070

OP	DATA type	Available device / Description / Range
S	BIT	X, Y, M, S, T, C, F, UB
		Contact of bit device
		Not applicable

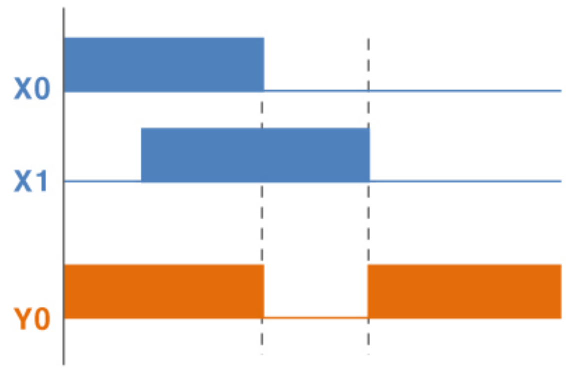
Error	Zero	Carry	Borrow	Step
				1

<Ladder>



Executes the ORN operation between the previous operation result and the designated contact(S), and considers it as the operation result.

<Time chart>



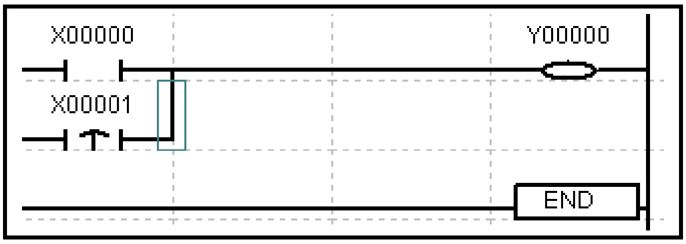
3.1.13 Contact instruction(ORP)

Contact instruction	ORP	S	Applicable model LP-S044, LP-S070

OP	DATA type	Available device / Description / Range
S	BIT	X, Y, M, S, T, C, F, UB
		Contact of bit device
		Not applicable

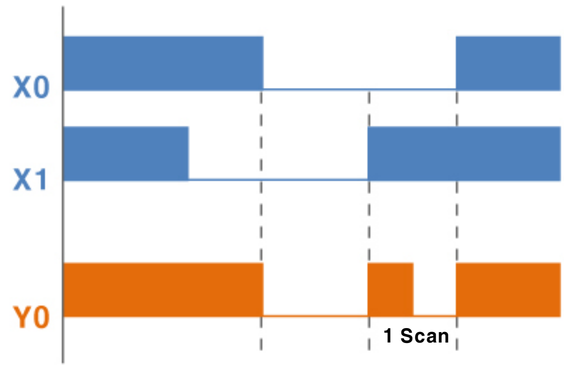
Error	Zero	Carry	Borrow	Step
				2

<Ladder>



On the rising edge of a pulse, executes OR or ORN operation between the previous operation result and designated contact(S), and considers it as the operation result.

<Time chart>



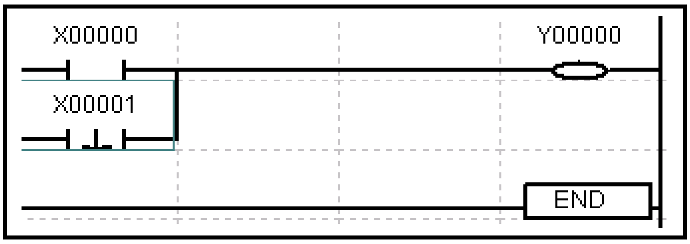
3.1.14 Contact instruction(ORF)

Contact instruction	ORF	S	Applicable model LP-S044, LP-S070

OP	DATA type	Available device / Description / Range
S	BIT	X, Y, M, S, T, C, F, UB
		Contact of bit device
		Not applicable

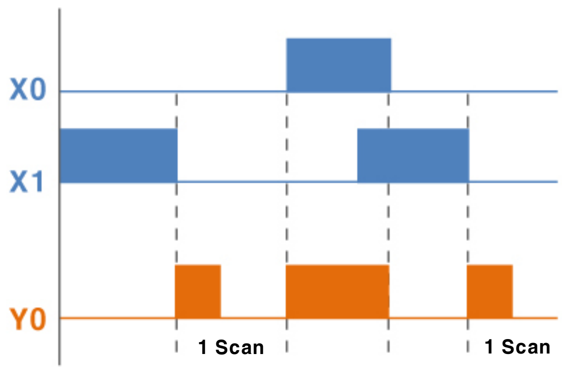
Error	Zero	Carry	Borrow	Step
				2

<Ladder>



On the falling edge of a pulse, executes OR or ORN operation between the previous operation result and the designated contact(S), and considers it as the operation result.

<Time chart>



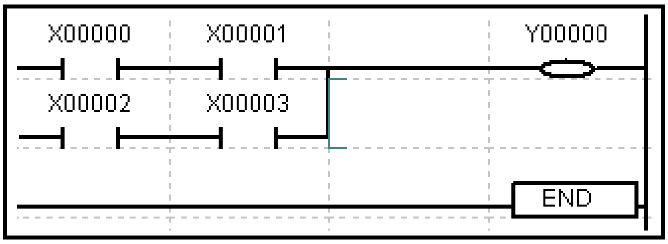
3.1.15 Contact instruction(ORL)

Contact instruction	**ORL**	Applicable model LP-S044, LP-S070

<Mnemonic & Ladder>

Step	Instruction	OP1	OP2
0	LOAD	X00000	
1	AND	X00001	
2	LOAD	X00002	
3	AND	X00003	
4	ORL		
5	OUT	Y00000	
6	END		

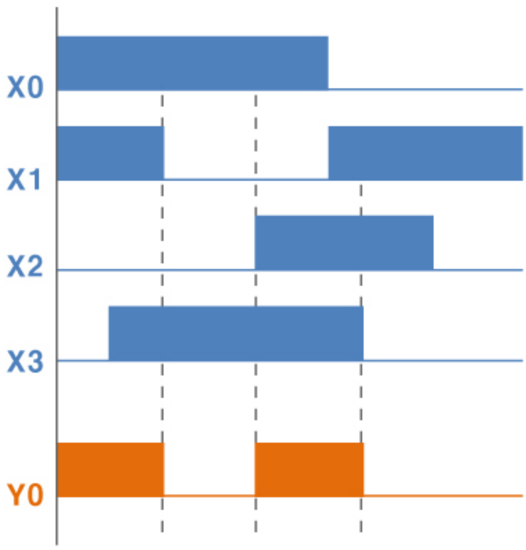
Executes the OR operation between the block and the block.



[Note]

- You cannot add as device input in ladder.
- Input for instruction is available only for mnemonic.

<Time chart>



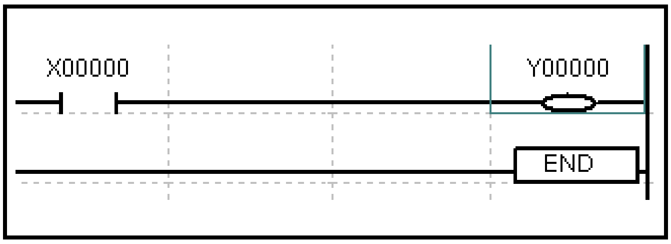
3.1.16 Output instruction(OUT)

Output instruction	OUT	D	Applicable model LP-S044, LP-S070

OP	DATA type	Available device / Description / Range
D	BIT	Y, F, S, M, UB
		ON/OFF contact of device
		Not applicable

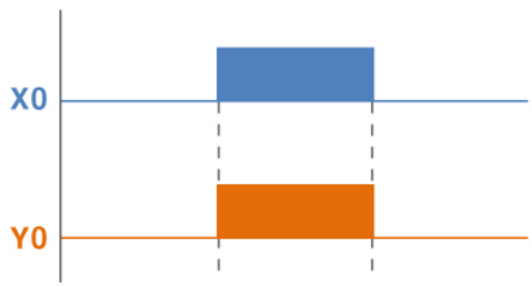
Error	Zero	Carry	Borrow	Step
				1

<Ladder>



Outputs the operation result executed to the OUT instruction to the (S) device.

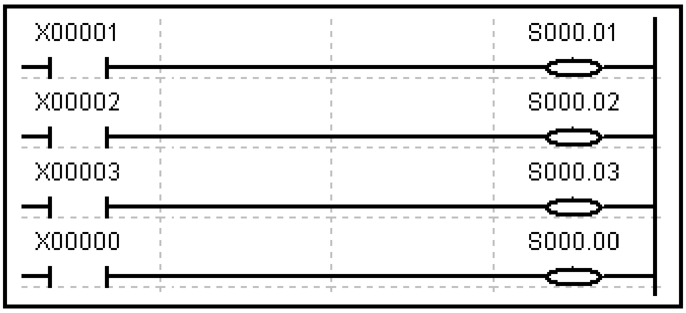
<Time chart>



3.1.17 Output instruction(OUT Syyy.xx)

Output instruction	OUT Syyy.xx D		Applicable model LP-S044, LP-S070				
OP	DATA type	Available device / Description / Range	Error	Zero	Carry	Borrow	Step
D	BIT	S					
		yyy is group number(0 to 255), xx is step number (0 to 99)					
		Not applicable					1

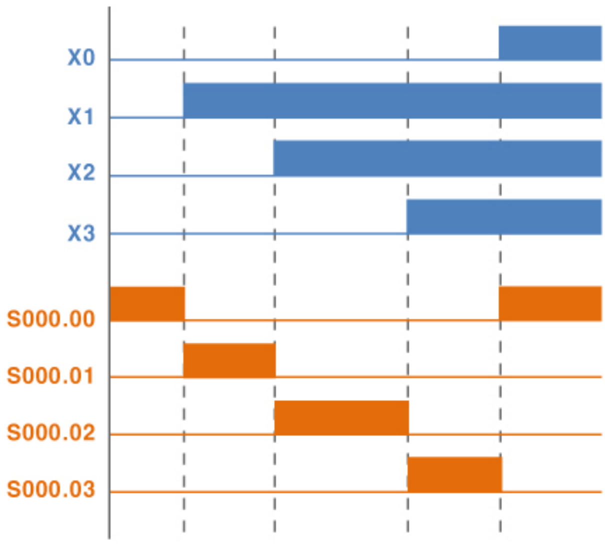
<Ladder>



Step device
yyy: Group number(0 to 255)
xx: Step number(0 to 99)

1. Unlikely the Sequential Control(Set Syyy.xx) Instructions, if input condition turns ON, the corresponding step becomes ON regardless of the step order.
2. Although a number of input condition contacts become ON in the same group, the last programmed contact is output firstly.
3. Even if the input condition turns OFF, the step number retains ON.
4. In order to clear the OUT Syyy.xx instruction, the input contact of Syyy.00 should become ON.

<Time chart>

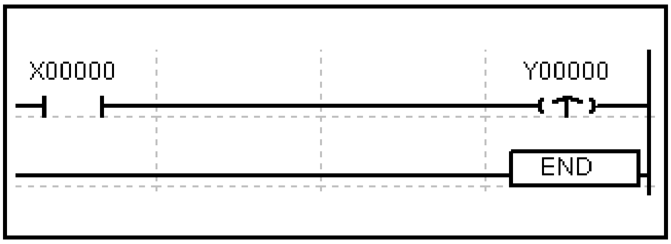


3.1.18 Output instruction(OUTP)

Output instruction	OUTP	D	Applicable model LP-S044, LP-S070

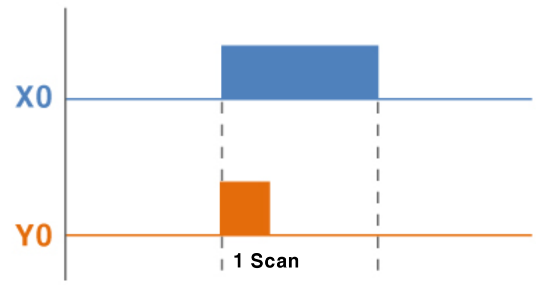
OP	DATA type	Available device / Description / Range	Error	Zero	Carry	Borrow	Step
D	BIT	Y, F, S, M, UB					
		Contact to be ON for one scan on the rising edge of a pulse					
		Not applicable					2

<Ladder>



When the operation result executed to the OUTP turns OFF from ON, the output contact becomes ON for only one scan and then becomes OFF for any other cases.

<Time chart>

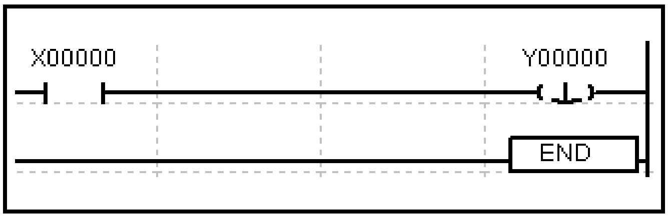


3.1.19 Output instruction(OUTF)

Output instruction	OUTF	D	Applicable model LP-S044, LP-S070

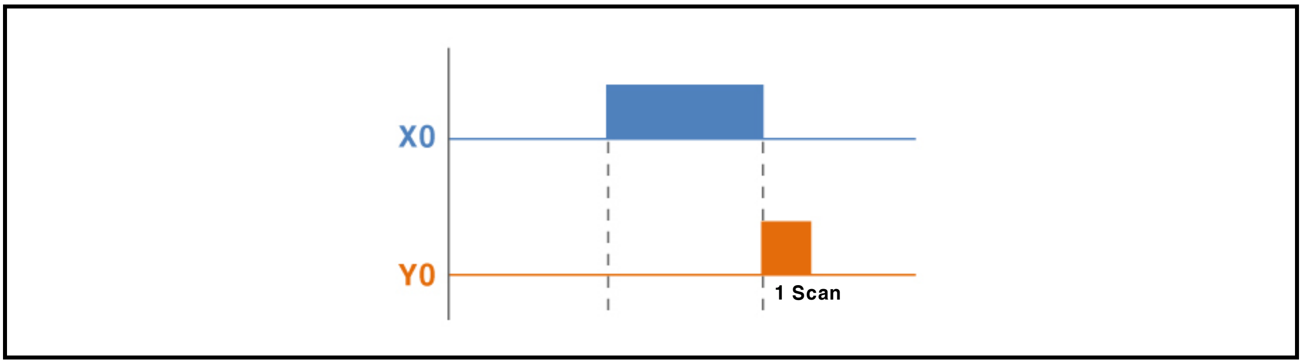
OP	DATA type	Available device / Description / Range	Error	Zero	Carry	Borrow	Step
D	BIT	Y, F, S, M, UB					
		Contact to be ON for one scan on the falling edge of a pulse					
		Not applicable					2

<Ladder>



When the operation result executed to the OUTF turns OFF from ON, the output contact becomes ON for only one scan and then becomes OFF for any other cases.

<Time chart>



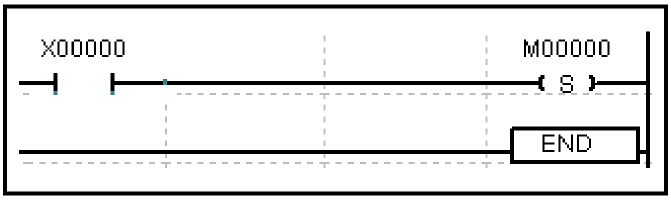
3.1.20 Output instruction(SET)

Output instruction	SET	D	Applicable model LP-S044, LP-S070

OP	DATA type	Available device / Description / Range
D	BIT	Y, F, S, T, C, M, UB
		Contact to be maintained ON status
		Not applicable

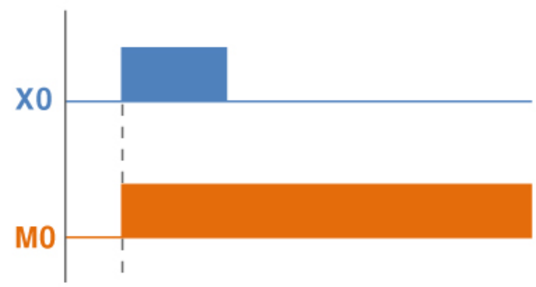
Error	Zero	Carry	Borrow	Step
				1

<Ladder>



1. Once the contact is SET, even if the input condition turns OFF, it retains SET status.
2. In order to turn OFF the contact, you should execute
the RST instruction.

<Time chart>



3.1.21 Output instruction(SET Syyy.xx)

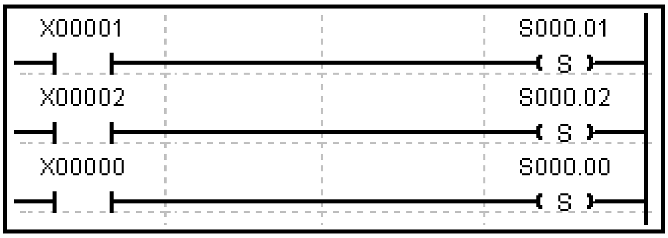
Output instruction **SET Syyy.xx** **D**

Applicable model

LP-S044, LP-S070

OP	DATA type	Available device / Description / Range	Error	Zero	Carry	Borrow	Step
D	BIT	S					
		yyy is group number(0 to 255), xx is step number (0 to 99)					
		Not applicable					1

<Ladder>



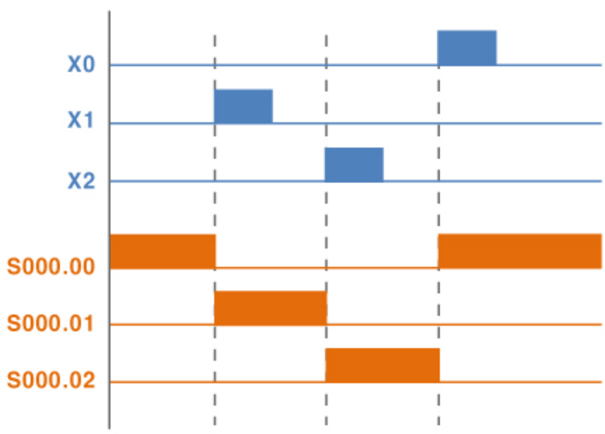
Step device

yyy: Group number(0 to 255)

xx: Step number(0 to 99)

1. If the input contact of current step number is ON while the previous step number is retaining ON status, the current step number turns ON and the previous step number turns OFF.
2. Even if the input contact turns OFF, S device at ON status still retains ON.
3. Syyy.00 is always ON status when starting the program.
4. In order to reset the Syyy.xx instruction, the input contact of Syyy.00 should become ON.

<Time chart>

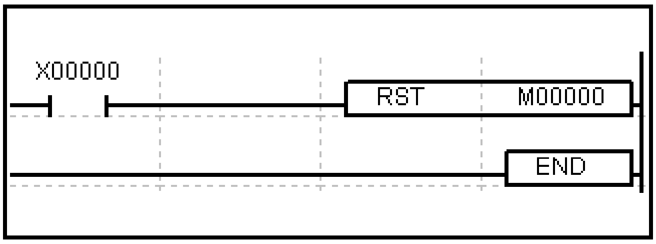


3.1.22 Output instruction(RST)

Output instruction	RST	D	Applicable model LP-S044, LP-S070

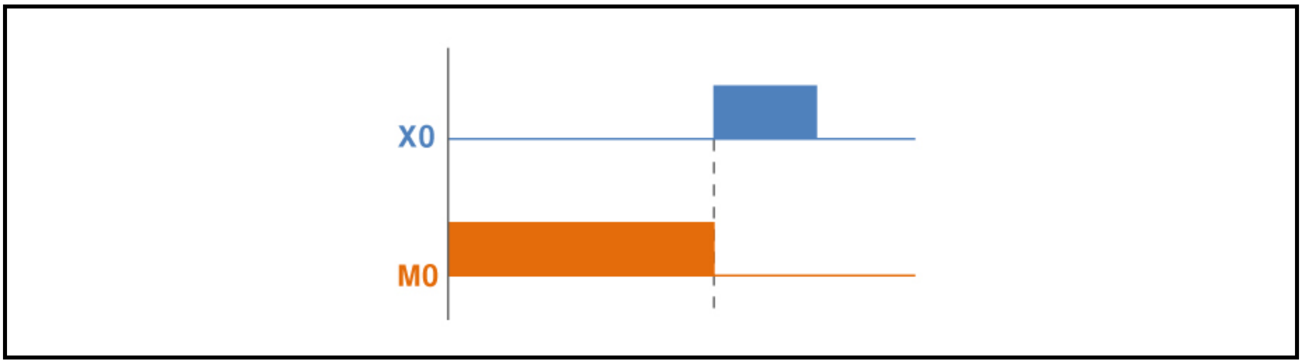
OP	DATA type	Available device / Description / Range	Error	Zero	Carry	Borrow	Step
D	BIT	Y, F, S, T, C, M, UB					
		Contact to be maintained OFF status					
		Not applicable					1

<Ladder>



1. If the input condition turns ON, the corresponding contact becomes OFF.
2. Even if the input condition turns OFF, the corresponding contact still retains OFF.

<Time chart>



3.1.23 Reversal instruction(ALT)

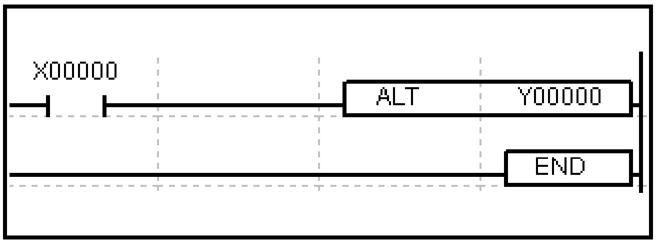
Reversal instruction **ALT** **D**

Applicable model

LP-S044, LP-S070

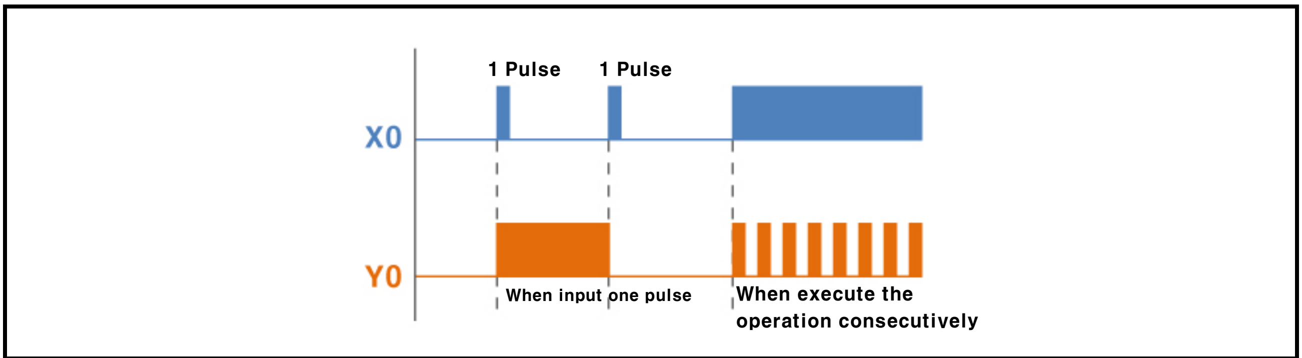
OP	DATA type	Available device / Description / Range	Error	Zero	Carry	Borrow	Step
D	BIT	Y, F, M ,UB					
		Data address to execute the operation					
		Not applicable					3

<Ladder>



Whenever the input condition turns ON from OFF, the output is reversed according to this, and this event is consecutively executed every operation cycle.

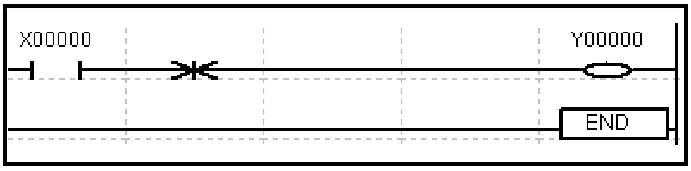
<Time chart>



3.1.24 Reversal instruction(NOT)

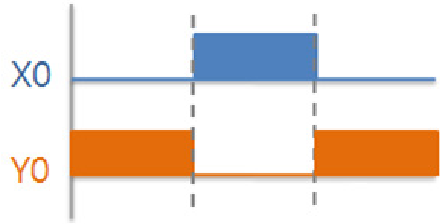
Reversal instruction	NOT	Applicable model LP-S044, LP-S070

<Ladder>



1. Transfers input by reversing.
2. A contact circuit is reversed as B contact circuit, B contact circuit is reversed as A contact circuit.

<Time chart>



3.1.25 Stack instruction(MPUSH)

Stack instruction	MPUSH	Applicable model LP-S044, LP-S070

The operation results executed to current are stored in the stack.

3.1.26 Stack instruction(MLOAD)

Stack instruction	MLOAD	Applicable model LP-S044, LP-S070

Loads the value stored in the stack.

3.1.27 Stack instruction(MPOP)

Stack instruction	MPOP	Applicable model LP-S044, LP-S070

Removes the data in the stack after reading it.

3.1.28 Exit instruction(END)

Exit instruction	END	Applicable model LP-S044, LP-S070

Exits the program.

3.2 Application instruction

3.2.1 Counter instruction(CTU)

Counter instruction **CTU** **S** **N**

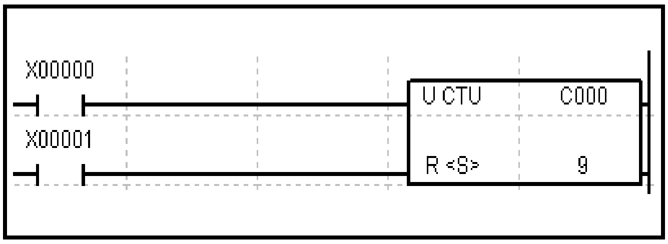
Applicable model

LP-S044, LP-S070

OP	DATA type	Available device / Description / Range
S	WORD	C, UW
		Counter contact you want to use
		0(h0000) to 65535(hFFFF)
N	WORD	X, Y, M, S, T, C, D, Z, F, UW, integer
		Setting value of counter
		0(h0000) to 65535(hFFFF)

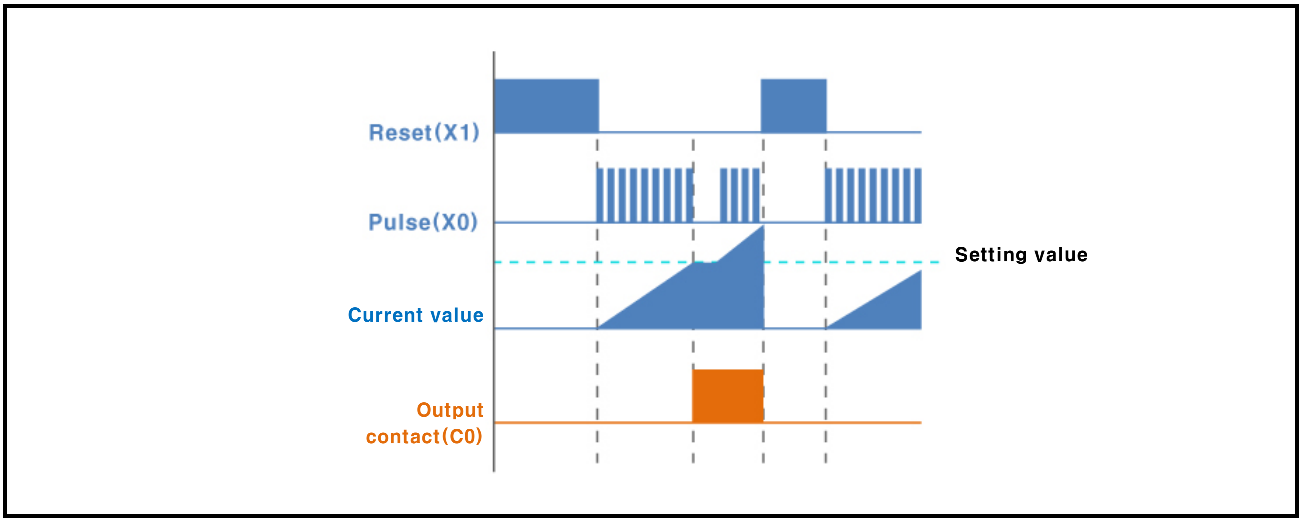
Error	Zero	Carry	Borrow	Step
				5

<Ladder>



1. If the pulse signal is applied to the input rung when the reset signal is OFF, the word value of S device is increased one by one, and then when it reaches the setting value N, the corresponding counter contact turns ON.
2. If the reset signal turns ON, the word value of S device becomes 0.

<Time chart>



3.2.2 Counter instruction(CTD)

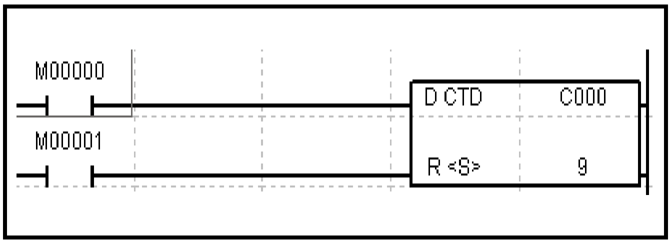
Counter instruction **CTD** **S** **N**

Applicable model
LP-S044, LP-S070

OP	DATA type	Available device / Description / Range
S	WORD	C, UW
		Counter contact you want to use
		0(h0000) to 65535(hFFFF)
N	WORD	X, Y, M , S, T, C, D, Z, F, UW, integer
		Setting value of counter
		0(h0000) to 65535(hFFFF)

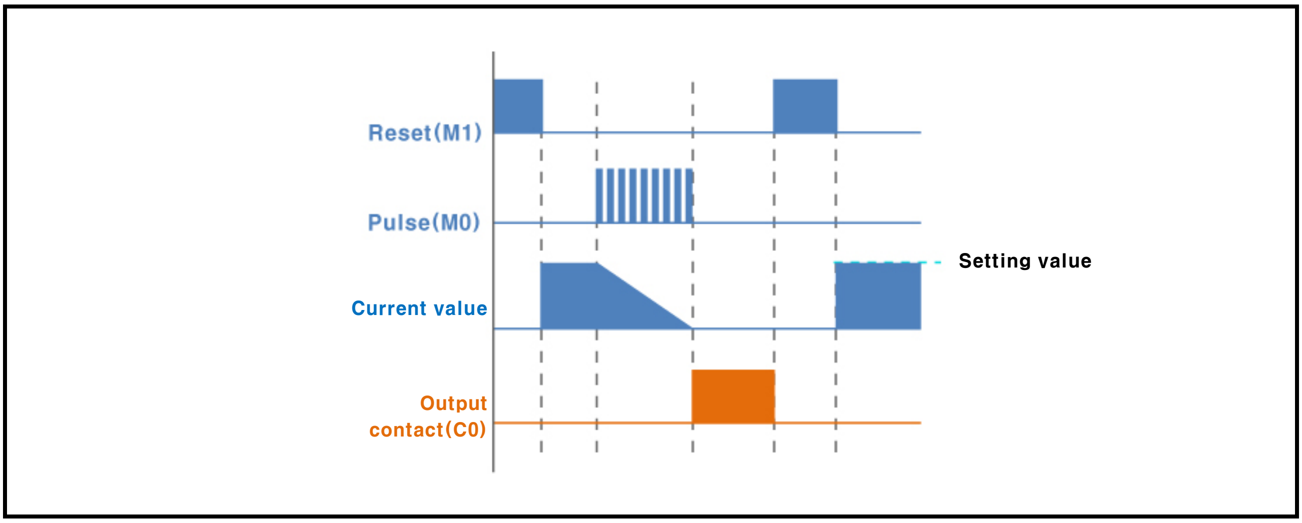
Error	Zero	Carry	Borrow	Step
				5

<Ladder>



1. If the pulse signal is applied to the input rung when the reset signal is OFF, the word value of S device is decreased one by one, and then when it reaches 0, the corresponding counter contact turns ON.
2. If the reset signal is ON, the word value of S device becomes the setting value “N” .

<Time chart>



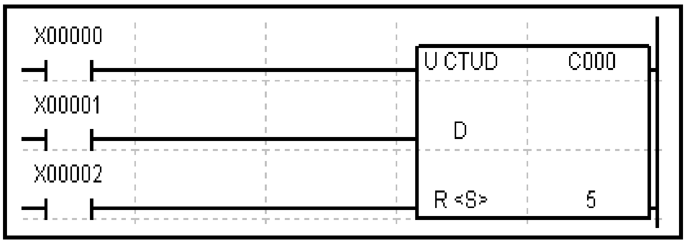
3.2.3 Counter instruction(CTUD)

Counter instruction	CTUD	S	N	Applicable model
				LP-S044, LP-S070

OP	DATA type	Available device / Description / Range
S	WORD	C, UW
		Counter contact you want to use
		0(h0000) to 65535(hFFFF)
N	WORD	X, Y, M , S, T, C, D, Z, F, UW, integer
		Setting value of counter
		0(h0000) to 65535(hFFFF)

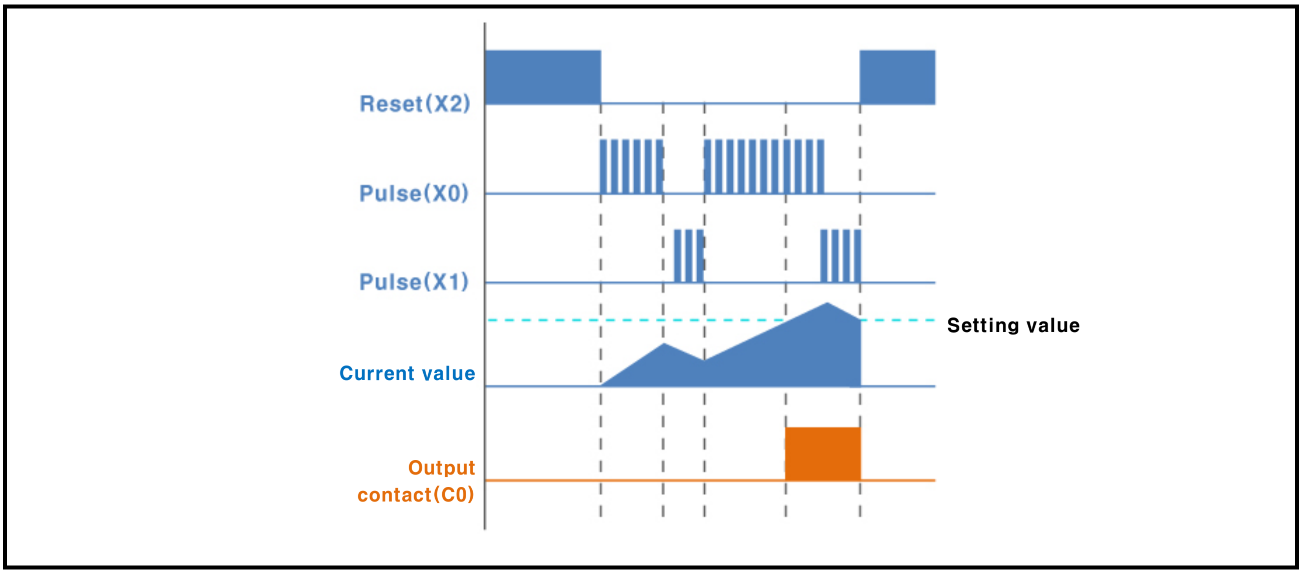
Error	Zero	Carry	Borrow	Step
				5

<Ladder>



1. If the count-up pulse is applied to the input rung when the reset signal is OFF, the the word value of S device is increased one by one. Likewise, if the count-down pulse is applied to the input rung, the word value of S device is decreased one by one.
2. If the word value of S device is greater than the setting value “N”, the corresponding counter contact turns ON, and if the word value of S device is less than the setting value “N”, the corresponding counter contact turns OFF.
3. If the reset signal is ON, the word value of S device becomes 0.

<Time chart>



3.2.4 Counter instruction(CTR)

Counter instruction	CTR	S	N

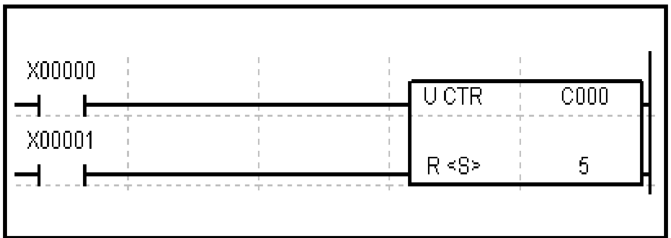
Applicable model

LP-S044, LP-S070

OP	DATA type	Available device / Description / Range
S	WORD	C, UW
		Counter contact you want to use
		0(h0000) to 65535(hFFFF)
N	WORD	X, Y, M , S, T, C, D, Z, F, UW, integer
		Setting value of counter
		0(h0000) to 65535(hFFFF)

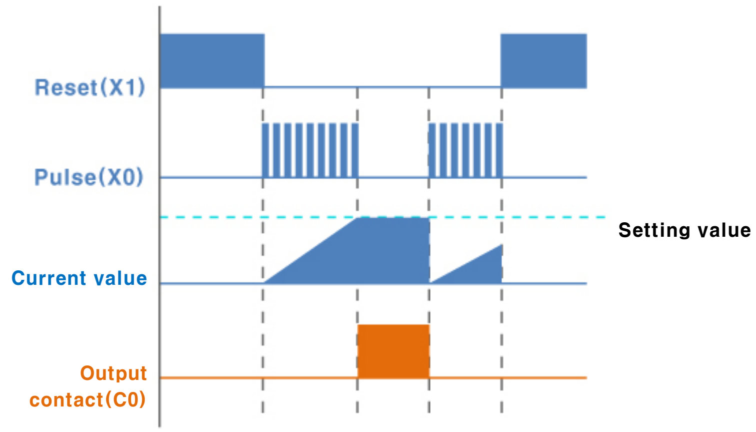
Error	Zero	Carry	Borrow	Step
				5

<Ladder>



1. If the pulse signal is applied to the input rung when the reset signal is OFF, the word value of S device is increased one by one, and then when it reaches 0, the corresponding counter contact turns ON.
2. If the pulse is continuously being input even after the reset signal is ON, the word value of S device is restarted at 0 again and the corresponding counter contact becomes OFF.
3. Even if the reset signal turns ON, the word value of S device becomes 0.

<Time chart>



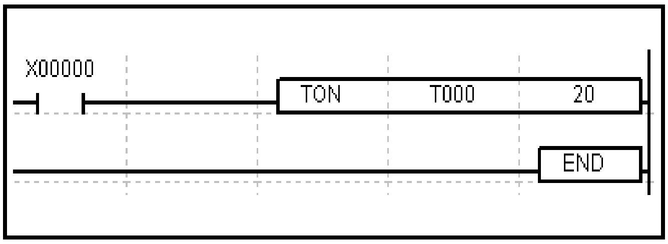
3.2.5 Timer instruction(TON)

Timer instruction	TON	S	N	Applicable model LP-S044, LP-S070

OP	DATA type	Available device / Description / Range
S	WORD	T, UW
		Timer contact you want to use
		0(h0000) to 65535(hFFFF)
N	WORD	X, Y, M , S, T, C, D, Z, F, UW, integer
		Setting value of timer
		0(h0000) to 65535(hFFFF)

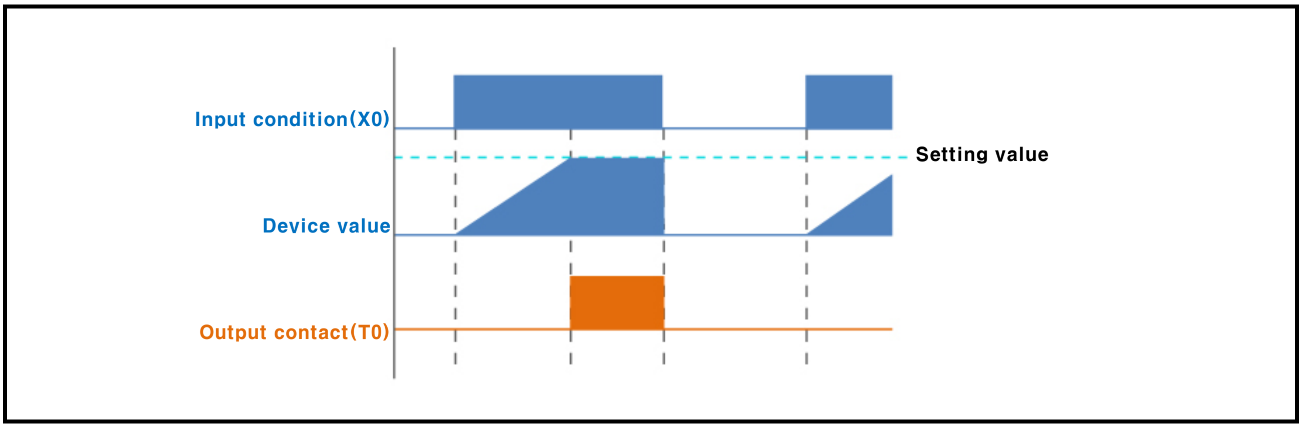
Error	Zero	Carry	Borrow	Step
				5

<Ladder>



1. As soon as the input condition is ON, S device value of the timer is increased one by one and then when it reaches the setting value "N", the corresponding timer contact turns ON.
2. If the input condition becomes OFF or encounters RSTxxx instruction, the corresponding timer contact turns OFF and the current value becomes 0.

<Time chart>



3.2.6 Timer instruction(TOFF)

Timer instruction	TOFF	S	N

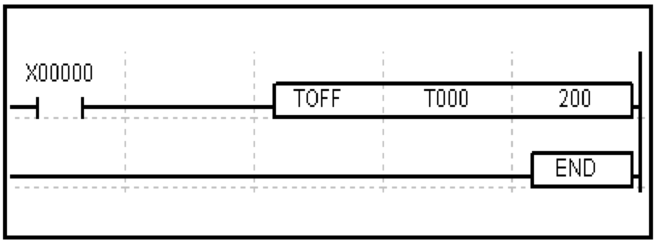
Applicable model

LP-S044, LP-S070

OP	DATA type	Available device / Description / Range
S	WORD	T, UW
		Timer contact you want to use
		0(h0000) to 65535(hFFFF)
N	WORD	X, Y, M , S, T, C, D, Z, F, UW, integer
		Setting value of timer
		0(h0000) to 65535(hFFFF)

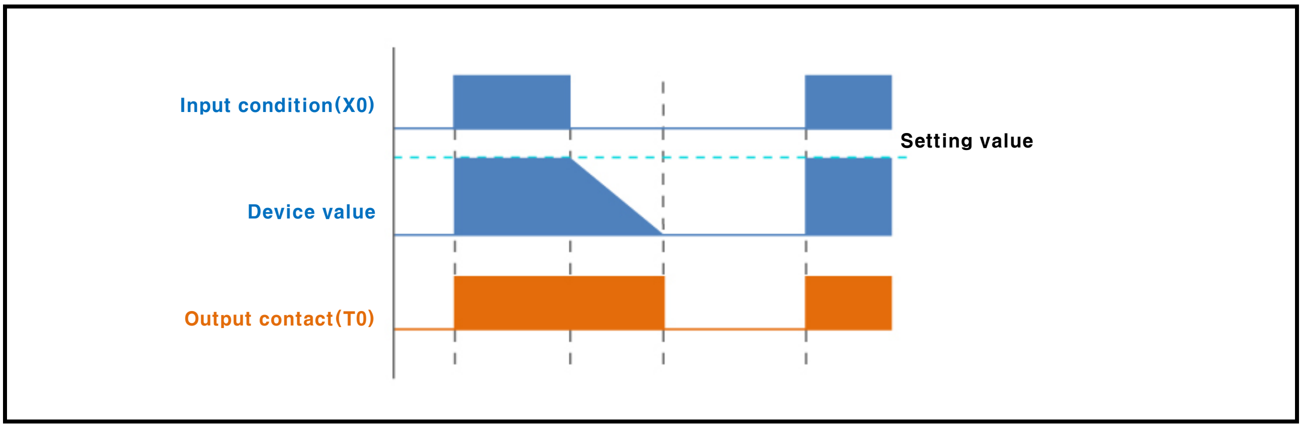
Error	Zero	Carry	Borrow	Step
				5

<Ladder>



1. As soon as the input condition is ON, S device value of the timer is changed into the setting value “N” and the corresponding timer contact becomes ON.
2. If the input condition becomes OFF, the current value of the timer is decreased one by one and when it reaches “0”, the corresponding timer contact becomes OFF.
3. If it encounters RST Txxxx instruction, the corresponding timer contact turns OFF and the setting value becomes “0”.

<Time chart>



3.2.7 Timer instruction(TMR)

Timer instruction	TMR	S	N

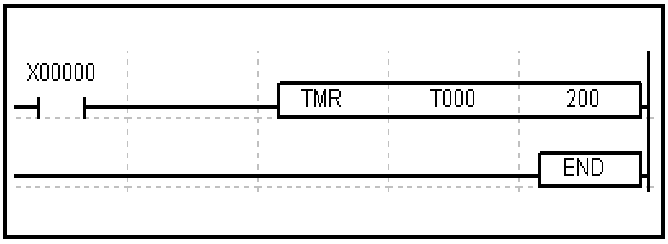
Applicable model

LP-S044, LP-S070

OP	DATA type	Available device / Description / Range
S	WORD	T, UW
		Timer contact you want to use
		0(h0000) to 65535(hFFFF)
N	WORD	X, Y, M , S, T, C, D, Z, F, UW, integer
		Setting value of timer
		0(h0000) to 65535(hFFFF)

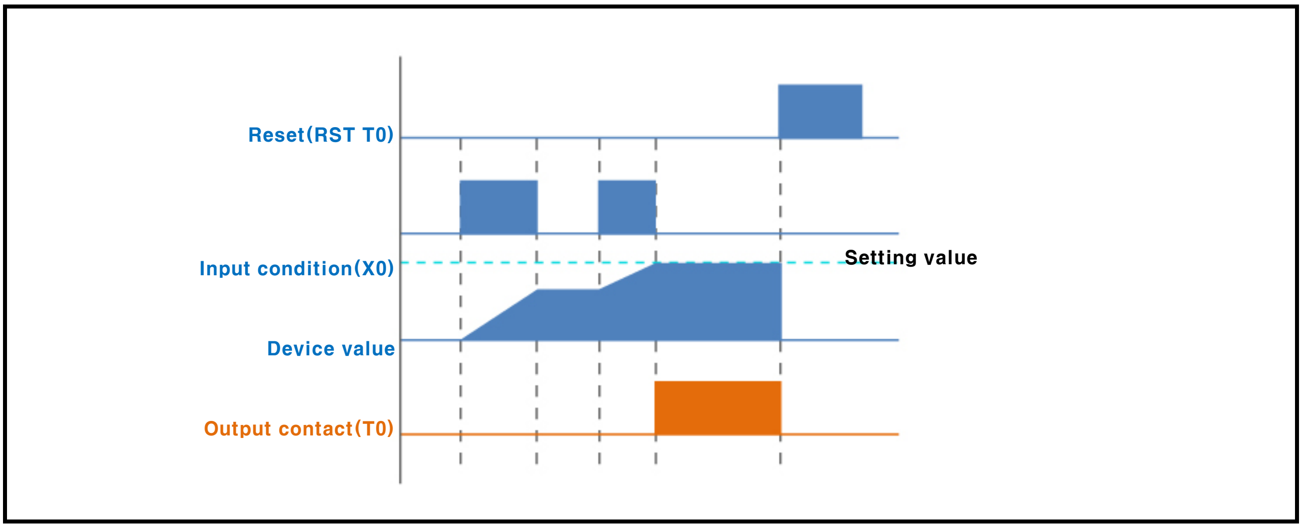
Error	Zero	Carry	Borrow	Step
				5

<Ladder>



1. When the input signal is ON, the S device value of the timer is increased. And when the input signal is OFF, even if its value does not reach the setting value “N”, it retains the current status of its value, and when the input signal is ON again it is increased from that value.
2. When the S device value reaches the setting value “N”, the corresponding timer contact turns ON. If it encounters RST Txxxx instruction, the corresponding timer contact turns OFF and the S device value becomes “0”.

<Time chart>



3.2.8 Timer instruction(TMON)

Timer instruction	TMON	S	N

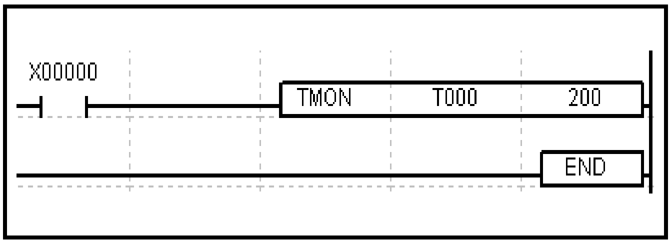
Applicable model

LP-S044, LP-S070

OP	DATA type	Available device / Description / Range
S	WORD	T, UW
		Timer contact you want to use
		0(h0000) to 65535(hFFFF)
N	WORD	X, Y, M , S, T, C, D, Z, F, UW, integer
		Setting value of timer
		0(h0000) to 65535(hFFFF)

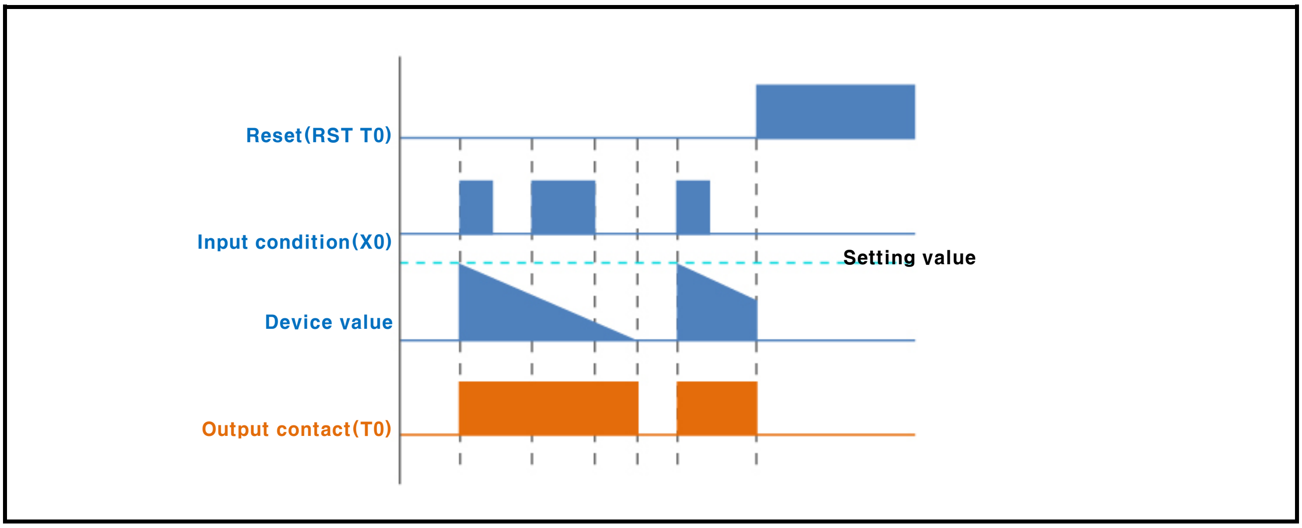
Error	Zero	Carry	Borrow	Step
				5

<Ladder>



1. As soon as the input condition is ON, the corresponding timer contact turns ON, and the S device value of the timer is changed into the setting value “N” then it is decreasing.
2. Although the input condition is changed into ON/OFF in the middle of the execution, the timer is continuously operating, and when S device value of the timer reaches “0”, the timer contact is to be OFF.
3. When it encounters RSTxxx instruction, the corresponding timer contact will be OFF and the S device value of the timer will be “0”. .

<Time chart>



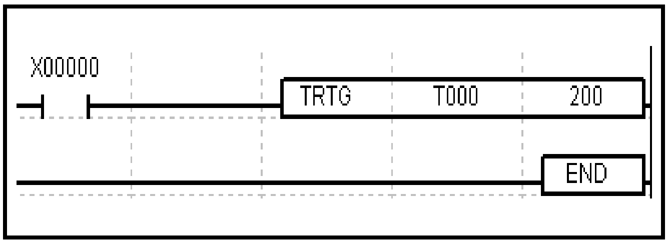
3.2.9 Timer instruction(TRTG)

Timer instruction	TRTG	S	N	Applicable model
				LP-S044, LP-S070

OP	DATA type	Available device / Description / Range
S	WORD	T, UW
		Timer contact you want to use
		0(h0000) to 65535(hFFFF)
N	WORD	X, Y, M , S, T, C, D, Z, F, UW, integer
		Setting value of timer
		0(h0000) to 65535(hFFFF)

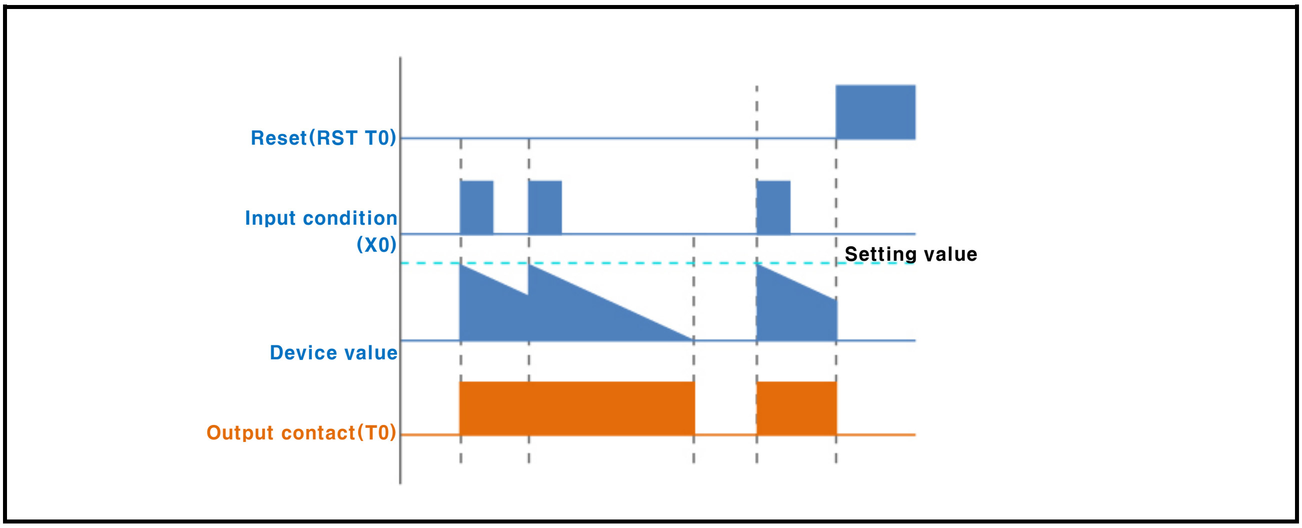
Error	Zero	Carry	Borrow	Step
				5

<Ladder>



1. As soon as the input condition is ON, the corresponding timer contact turns ON and the S device value is changed into the setting value “N” then it is decreasing.
2. If the input condition turns OFF in the middle of the execution and then becomes ON, the S device value is changed into the setting value “N” again then it will be decreasing.
3. If it encounters the RST instruction, the corresponding timer contact turns OFF and the S device value is changed into “0”.

<Time chart>



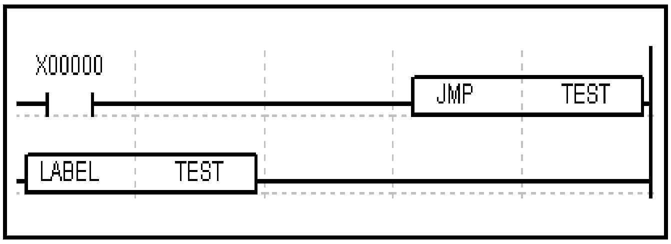
3.2.10 Control instruction(JMP)

Control instruction	JMP	LABEL	Applicable model
			LP-S044, LP-S070

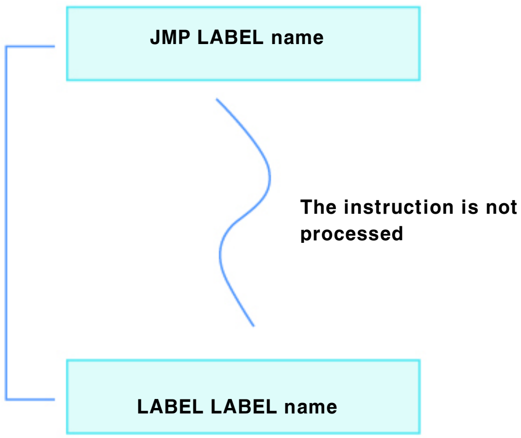
OP	DATA type	Available device / Description / Range
LABEL	STRING	LABEL name
		Label for the place to jump
		STRING

Error	Zero	Carry	Borrow	Step
◎				3

<Ladder>



1. Jump to the place where the LABEL is matched.
2. When executing the JMP instruction, it does not process the instructions between JMP to LABEL.
3. If the LABEL does not exist, error flag occurs.



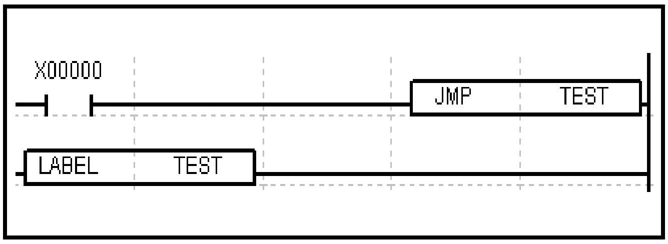
3.2.11 Control instruction(LABEL)

Control instruction	LABEL	Label name	Applicable model
			LP-S044, LP-S070

OP	DATA type	Available device / Description / Range
Lable name	STRING	LABEL name
		Label for the place to be jumped
		STRING

Error	Zero	Carry	Borrow	Step
				3

<Ladder>



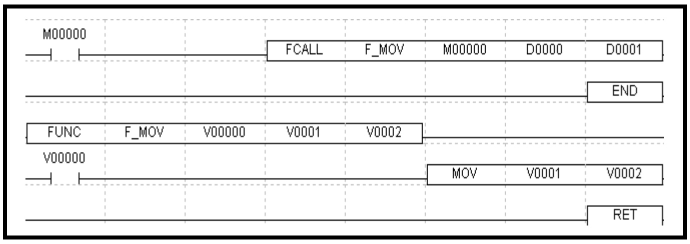
It is a destination for the JMP instruction.

3.2.12 Control instruction(FCALL)

Control instruction	FCALL	LABEL	Applicable model LP-S044, LP-S070

OP	DATA type	Available device / Description / Range	Error	Zero	Carry	Borrow	Step
LABEL	STRING	LABEL name					
		Label for the function to call					
		STRING	◎				3

<Ladder>



1. Calls the registered user defined function.
2. If you call an unused function, error flag occurs.
3. When you input the instruction statement, the number of operands should be matched.

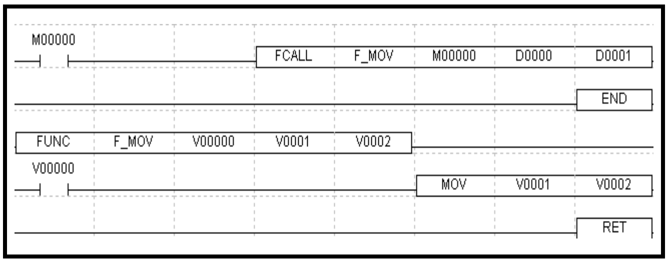
3.2.13 Control instruction(FUNC)

Control instruction	FUNC	LABEL	Applicable model LP-S044, LP-S070

OP	DATA type	Available device / Description / Range
LABEL	STRING	LABEL name
		Lable for the starting position of the function
		STRING

Error	Zero	Carry	Borrow	Step
				3

<Ladder>

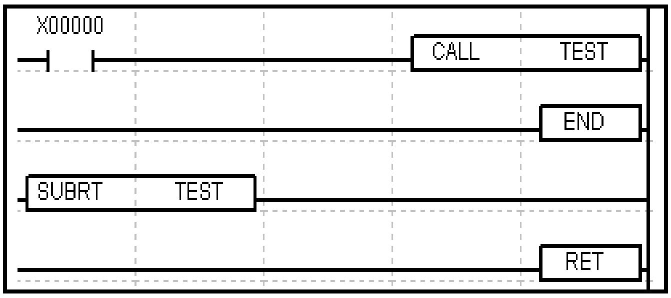


1. Represents the starting position of the user defined function.
2. It should be located behind the END sentence.
3. The virtual function device “V” is being used.
4. The RET sentence should be located in the last part of the FUNC statement.

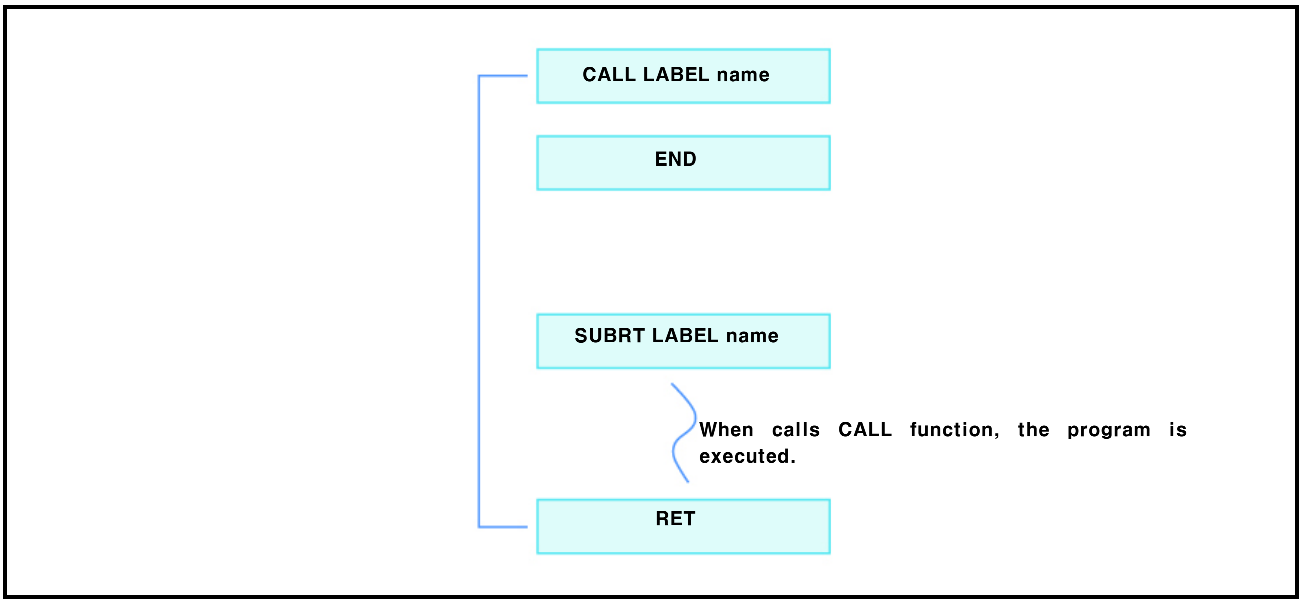
3.2.14 Branch instruction(CALL)

Branch instruction	CALL	LABEL	Applicable model LP-S044, LP-S070				
OP	DATA type	Available device / Description / Range	Error	Zero	Carry	Borrow	Step
LABEL	STRING	LABEL name					
		Label for the function to call					
		STRING					3

<Ladder>



1. Calls the subroutine, such as “LABLE” name. (Executing the program between the SUBRT LABEL to RET instructions)
2. CALL LABEL can be used in duplicating, and the program between SUBRT LABEL to RET instructions should be located hehind the END instruction.



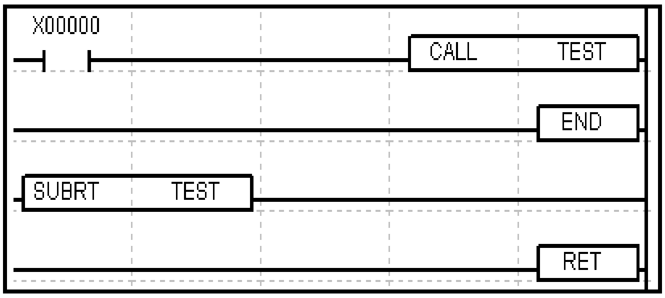
3.2.15 Branch instruction(SUBRT)

Branch instruction	SUBRT	LABEL	Applicable model LP-S044, LP-S070

OP	DATA type	Available device / Description / Range
LABEL	STRING	LABEL name
		A lable for the called function
		STRING

Error	Zero	Carry	Borrow	Step
				3

<Ladder>



1. Displays the starting point of the CALL subroutine.
2. It should be located hehind END and can not be used in duplicate.(For CALL statement, it is able to be used in duplicate)

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3.2.16 Branch instruction(RET)

Branch instruction	RET	Applicable model LP-S044, LP-S070

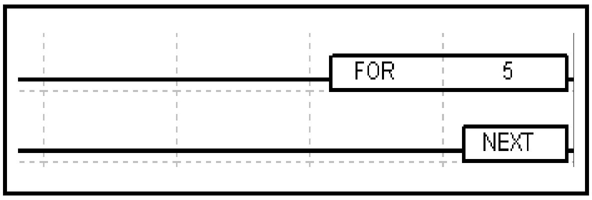
Exits the subroutine

3.2.17 Loop instruction(FOR)

Loop instruction	FOR	N	Applicable model LP-S044, LP-S070

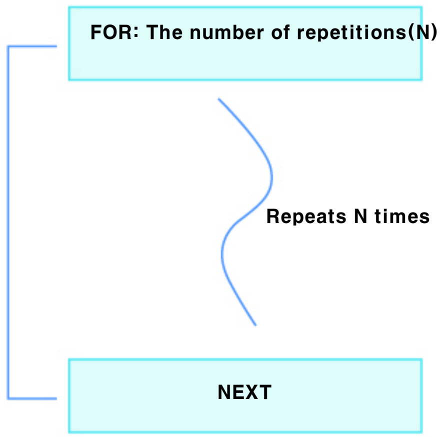
OP	DATA type	Available device / Description / Range	Error	Zero	Carry	Borrow	Step
N	WORD	Integer					
		0(h0000) to 65535(hFFFF)					3

<Ladder>



1. Sets the number of repetitions for the program with the NEXT instruction.
2. The program is repeated N times until encountering the NEXT.
3. The range for the number of repetitions is from 0 to 65535.

[Note]
The scan time can be longer than you expected therefore please use the WDT instruction in order not to exceed the setting value.



3.2.18 Loop instruction(NEXT)

Loop instruction	NEXT	Applicable model LP-S044, LP-S070

The program is repeated from the FOR instruction to the NEXT instruction.

3.2.19 Loop instruction(BREAK)

Loop instruction	BREAK	Applicable model LP-S044, LP-S070

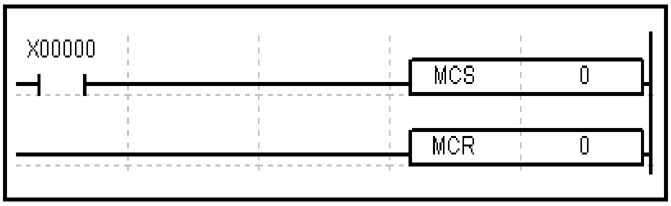
Repeat operation is executed with FOR, NEXT instruction. With BREAK instruction the repeated operation stops even though repeated execution is not complete.

3.2.20 Master control instruction(MCS)

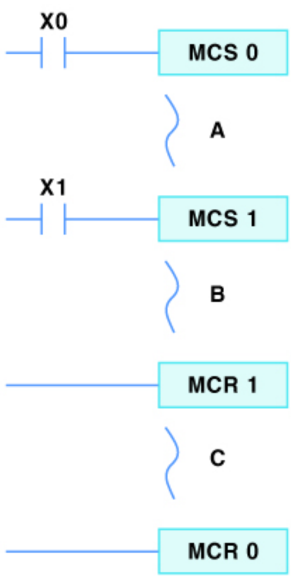
Master control instruction	MCS	N	Applicable model
			LP-S044, LP-S070

OP	DATA type	Available device / Description / Range	Error	Zero	Carry	Borrow	Step
N	Invariable number	Integer	◎				2
		MCS number (0 to 7)					
		0 to 7					

<Ladder>



1. If the input condition of MCS is ON, the program is executed to the MCR instruction which has the same number of MCS. And if the input condition turns OFF, the program does not execute the instruction.
2. MCS number “0” has the highest priority and MCS number “15” has the lowest priority, therefore you should use them in order of priority, and should clear them in reverse order.
3. When you execute the MCR instruction, if you clear the higher priority the MCS block, which has the lower priority, is cleared too.
4. MCS or MCR instruction should be used in order of its priority.



Example) 1. When X0 is ON and X1 is OFF,
A and C program are cleared

2.When XO is ON and X1 is ON,
A, B, C program are cleared

3. When XO is OFF and X1 is ON,
A, B, C program are not cleared.

4. When XO is OFF and X1 is OFF,
A, B, C programs are not cleared.

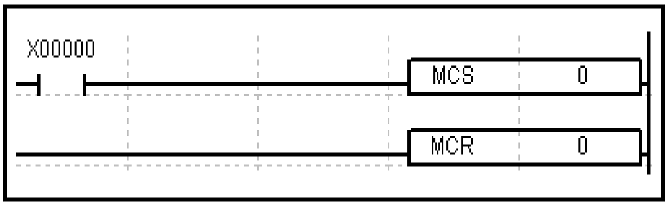
3.2.21 Master control instruction(MCR)

Master control instruction	MCR	N	Applicable model
			LP-S044, LP-S070

OP	DATA type	Available device / Description / Range
N	Invariable number	Integer
		MCR number (0 to 7)
		0 to 7

Error	Zero	Carry	Borrow	Step
				2

<Ladder>



Master control reset
Clears the registered master control by using the MCS instruction.

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3.2.22 Interrupt instruction(EI)

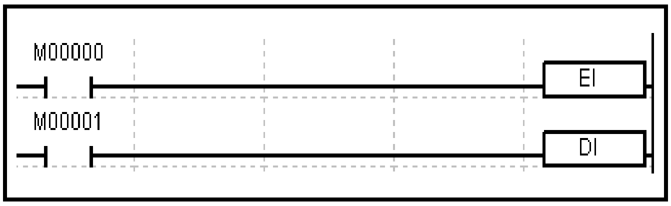
Interrupt instruction **EI**

Applicable model

LP-S044, LP-S070

OP	DATA type	Available device / Description / Range	Error	Zero	Carry	Borrow	Step
		Not applicable					
							1

<Ladder>



Enable Interrupt

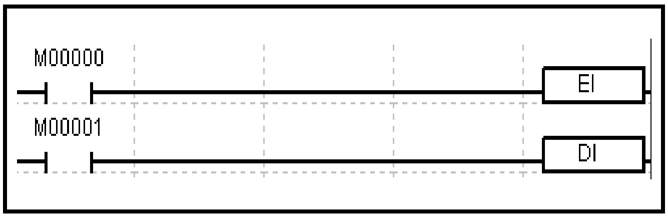
1. Enables all interrupts.
2. Enables the entire time interrupts and external interrupts.
3. In order to use the individual interrupt, you should use ETI and EEI instructions.

3.2.23 Interrupt instruction(DI)

Interrupt instruction	DI	Applicable model LP-S044, LP-S070

OP	DATA type	Available device / Description / Range	Error	Zero	Carry	Borrow	Step
							1

<Ladder>



Disable Interrupt

1. Disables all interrupts.
2. Disables the entire time interrupts and external interrupts.
3. In order to disable the individual interrupt, you should use the DTI and DEI instructions.

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3.2.24 Interrupt instruction(ETI)

Interrupt instruction **ETI**

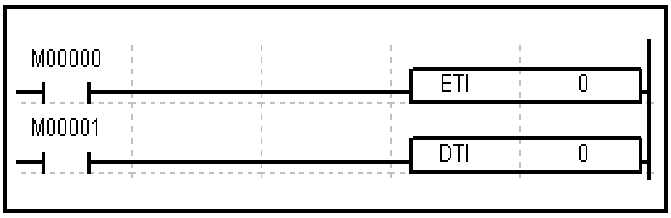
Applicable model

LP-S044, LP-S070

OP	DATA type	Available device / Description / Range
	Invariable number	Integer
		0 to 7

Error	Zero	Carry	Borrow	Step
				1

<Ladder>



Enable Time Interrupt

1. Enables the individual time interrupt.
2. In order to use ETI, you should activate all interrupts by using EI instruction first.
3. Structure of the instructions

ETI Time Interrupt Number(0 to 7)

3.2.25 Interrupt instruction(EEI)

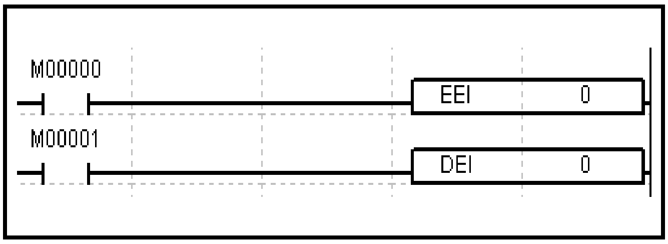
Interrupt instruction **EEI**

Applicable model

LP-S044, LP-S070

OP	DATA type	Available device / Description / Range	Error	Zero	Carry	Borrow	Step
	Invariable number	Integer					
		0 to 15					1

<Ladder>



1. Enables the individual external interrupt.
2. In order to use the EEI, you should activate all interrupts by using EI instruction first.
3. Structure of the instructions

<u>EEI</u> <u>External Interrupt Number(0 to 15)</u>

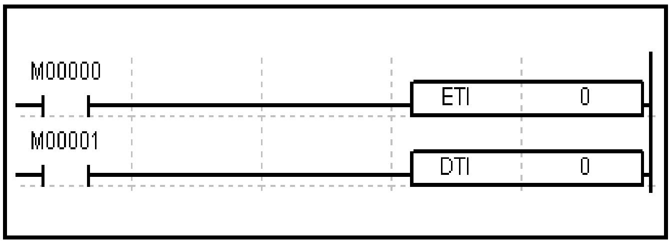
3.2.26 Interrupt instruction(DTI)

Interrupt instruction **DTI**

Applicable model
LP-S044, LP-S070

OP	DATA type	Available device / Description / Range	Error	Zero	Carry	Borrow	Step
	Invariable number	Integer					
		0 to 7					1

<Ladder>



Disable Time Interrupt
1. Disables the individual time interrupt.
2. Structure of the instructions

<u>DTI</u> <u>Time Interrupt Number(0 to 7)</u>

3.2.27 Interrupt instruction(DEI)

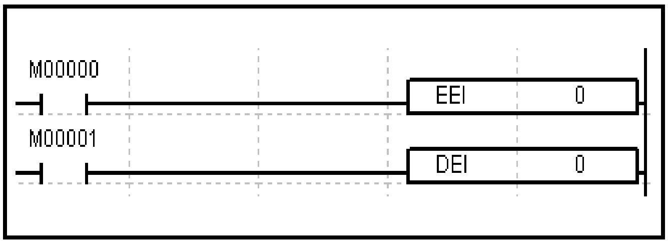
Interrupt instruction **DEI**

Applicable model

LP-S044, LP-S070

OP	DATA type	Available device / Description / Range	Error	Zero	Carry	Borrow	Step
	Invariable number	Integer					
		0 to 15					1

<Ladder>



Disable External Interrupt

1. Disables the individual external interrupt.
2. Structure of the instructions

DEI External Interrupt Number(0 to 15)

3.2.28 Interrupt instruction(TINT)

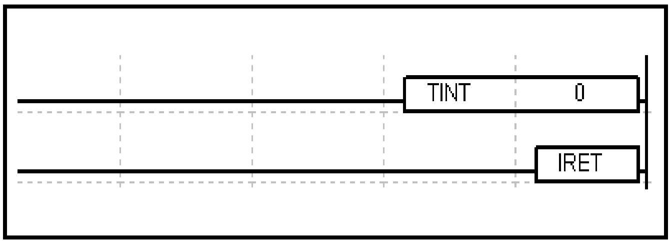
Interrupt instruction **TINT**

Applicable model

LP-S044, LP-S070

OP	DATA type	Available device / Description / Range	Error	Zero	Carry	Borrow	Step
	Invariable number	Integer					1
		0 to 7					

<Ladder>

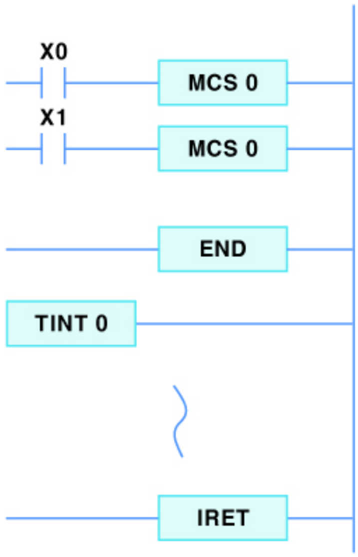


Time Interrupt

1. Represnts the starting point of the time interrupt block.
2. In order to indicate the end of block, you should use the IRET instruction at the end of TINT block.
3. Structure of the instructions

<u>TINT</u> <u>Time Interrupt Number(0 to 7)</u>

Example)



As soon as the input contact of ETI 0 is ON, TINT0 to IRET loop runs.

When the input contact of DTI 0 is ON, TINT0 to IRET loop stops.

3.2.29 Interrupt instruction(EINT)

Interrupt instruction **EINT**

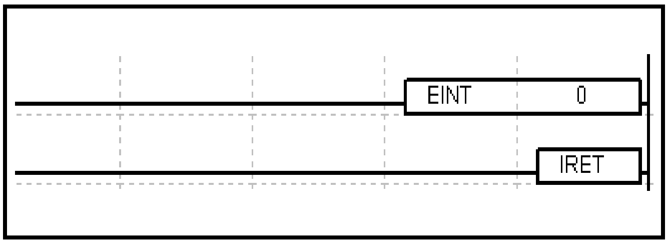
Applicable model

LP-S044, LP-S070

OP	DATA type	Available device / Description / Range
	Invariable number	Integer
		0 to 15

Error	Zero	Carry	Borrow	Step
				1

<Ladder>



External Interrupt

1. Represent the starting point of the external interrupt block.
2. In order to indicate the end of block, you should use the IRET instruction at the end of EINT block.
3. Structure of the instructions

<u>EINT</u>   <u>External Interrupt Number(0 to 15)</u>

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3.2.30 Interrupt instruction(IRET)

Interrupt instruction **IRET**

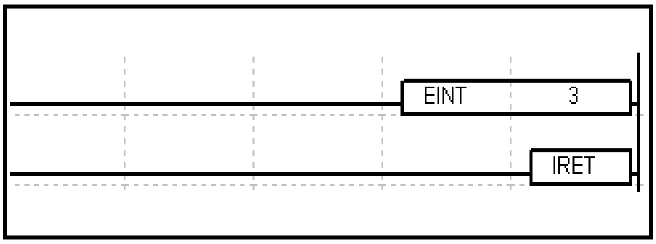
Applicable model

LP-S044, LP-S070

OP	DATA type	Available device / Description / Range

Error	Zero	Carry	Borrow	Step
				1

<Ladder>



Interrupt Return

1. Represents the end of time interrupt and external interrupt blocks.
2. As below, it is generally being used with TINT or EINT instruction as a pair.

TINT to IRET

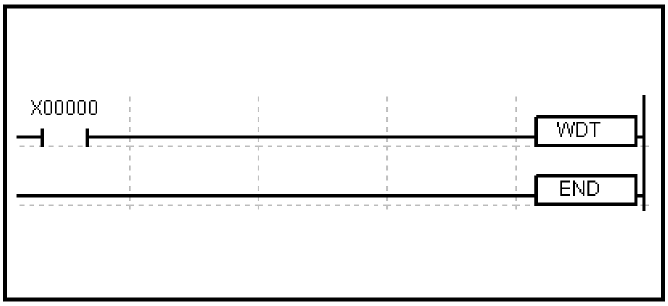
EINT to IRET

3.2.31 Watchdog timer(WDT)

Watchdog timer	WDT	Applicable model LP-S044, LP-S070

OP	DATA type	Available device / Description / Range	Error	Zero	Carry	Borrow	Step
							1

<Ladder>



1. Resets watch dog timer during the program operation.
2. When the operation time from 0 step to END is over than max. watch dog setting time, program operation stops and WDT instruction should be used.
3. Watch dog setting value is able to change by special device.
4. When resupply power, watch dog setting value is reset as 200ms.

3.2.32 Input comparison instruction(LOAD=)

Input comparison instruction	LOAD=	S1	S2

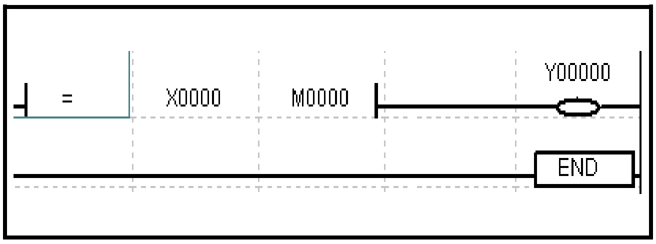
Applicable model

LP-S044, LP-S070

OP	DATA type	Available device / Description / Range
S1	INT	X, Y, F, Z, T, C, M, S, L, D, UW, integer
		Data or address to compare with S2
		-32768(h8000) to 32767(h7FFF)
S2	INT	X, Y, F, Z, T, C, M, S, L, D, UW, integer
		Data or address to compare with S1
		-32768(h8000) to 32767(h7FFF)

Error	Zero	Carry	Borrow	Step
				5

<Ladder>



1. Compares the word value of S1 with that of S2, and if they are equal it turns ON.
2. If the word values of S1 and S2 are not equal, it turns OFF.
3. Executes the Signed comparison.
(h8000(-32768) to hFFFF(-1) < 0 to h7FFF(32767))

Ex)

LOAD= H0001 H3456 —Comparision result→ OFF

LOAD= H0001 H0001 —Comparision result→ ON

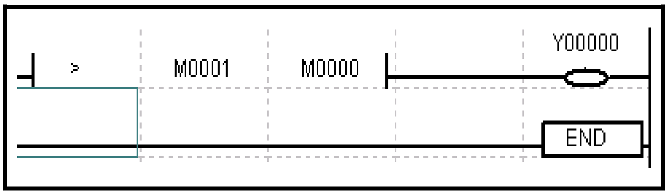
3.2.33 Input comparison instruction(LOAD>)

Input comparison instruction	LOAD>	S1	S2	Applicable model
				LP-S044, LP-S070

OP	DATA type	Available device / Description / Range
S1	INT	X, Y, F, Z, T, C, M, S, L, D, UW, integer
		Data or address to compare with S2
		-32768(h8000) to 32767(h7FFF)
S2	INT	X, Y, F, Z, T, C, M, S, L, D, UW, integer
		Data or address to compare with S1
		-32768(h8000) to 32767(h7FFF)

Error	Zero	Carry	Borrow	Step
				5

<Ladder>



1. If the word value of S1 is greater than that of S2, it turns ON.
2. If the word value of S1 is less than or equal to that of S2, it turns OFF.
3. Execute the Signed comparison.
(h8000(-32768) to hFFFF(-1) < 0 to h7FFF(32767))

Ex)

LOAD> H0001 H3456	Comparision result →	OFF
LOAD> H0F5D H0001	Comparision result →	ON

3.2.34 Input comparison instruction(LOAD<)

Input comparison instruction | **LOAD<** | **S1** | **S2**

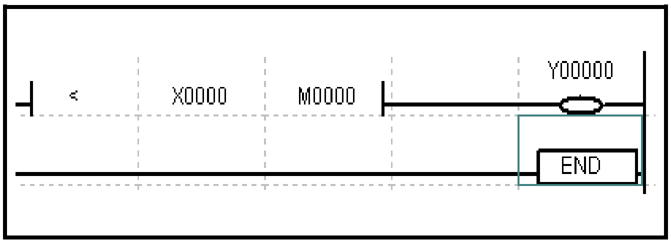
Applicable model

LP-S044, LP-S070

OP	DATA type	Available device / Description / Range
S1	INT	X, Y, F, Z, T, C, M, S, L, D, UW, integer
		Data or address to compare with S2
		-32768(h8000) to 32767(h7FFF)
S2	INT	X, Y, F, Z, T, C, M, S, L, D, UW, integer
		Data or address to compare with S1
		-32768(h8000) to 32767(h7FFF)

Error	Zero	Carry	Borrow	Step
				5

<Ladder>



1. If the world value of S1 is less than that of S2, it turns ON.
2. If the word value of S1 is greater than or equal to that of S2, it turns OFF.
3. Executes the Signed comparision.
(h8000(-32768) to hFFFF(-1) < 0 to hFFFF(32767))

Ex)

LOAD< H0001 H3456 → Comparision result → ON

LOAD< H0F5D H0001 → Comparision result → OFF

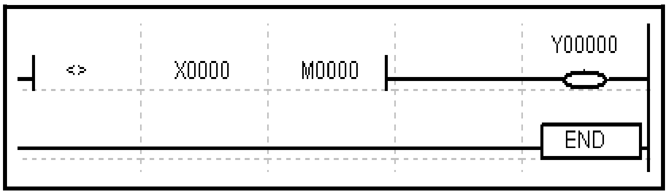
3.2.35 Input comparison instruction(LOAD<>)

Input comparison instruction	LOAD<>	S1	S2	Applicable model
				LP-S044, LP-S070

OP	DATA type	Available device / Description / Range
S1	INT	X, Y, F, Z, T, C, M, S, L, D, UW, integer
		Data or address to compare with S2
		-32768(h8000) to 32767(h7FFF)
S2	INT	X, Y, F, Z, T, C, M, S, L, D, UW, integer
		Data or address to compare with S1
		-32768(h8000) to 32767(h7FFF)

Error	Zero	Carry	Borrow	Step
				5

<Ladder>



1. If the word values of S1 and S2 are not equal, it turns ON.
2. If the word values of S1 and S2 are equal, it turns OFF.
3. Executes the Signed comparision.
(h8000(-32768) to hFFFF(-1) < 0 to h7FFF(32767))

Ex)

LOAD<> H0001 H3456	Comparision result →	ON
LOAD<> H0002 H0002	Comparision result →	OFF

3.2.36 Input comparison instruction(LOAD>=)

Input comparison instruction **LOAD>=** **S1** **S2**

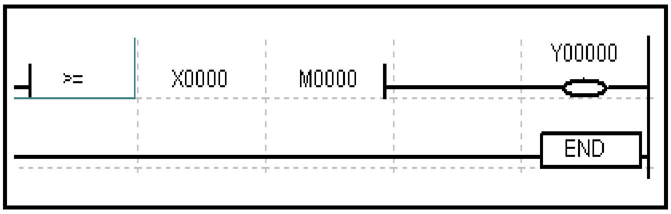
Applicable model

LP-S044, LP-S070

OP	DATA type	Available device / Description / Range
S1	INT	X, Y, F, Z, T, C, M, S, L, D, UW, integer
		Data or address to compare with S2
		-32768(h8000) to 32767(h7FFF)
S2	INT	X, Y, F, Z, T, C, M, S, L, D, UW, integer
		Data or address to compare with S1
		-32768(h8000) to 32767(h7FFF)

Error	Zero	Carry	Borrow	Step
				5

<Ladder>



1. If the word value of S1 is less than or equal to that of
S2, it turns ON.
2. If the word value of S1 is greater than that of S2, it turns OFF.
3. Executes the Signed comparision.
(h8000(-32768) to hFFFF(-1) < 0 to h7FFF(32767))

Ex)

LOAD>= H0001 H3456	Comparision result →	OFF
LOAD>= H0F5D H0001	Comparision result →	ON

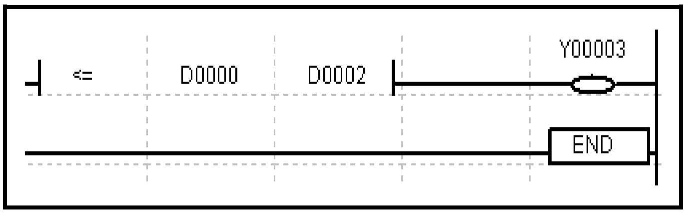
3.2.37 Input comparison instruction(LOAD<=)

Input comparison instruction	LOAD<=	S1	S2	Applicable model
				LP-S044, LP-S070

OP	DATA type	Available device / Description / Range
S1	INT	X, Y, F, Z, T, C, M, S, L, D, UW, integer
		Data or address to compare with S2
		-32768(h8000) to 32767(h7FFF)
S2	INT	X, Y, F, Z, T, C, M, S, L, D, UW, integer
		Data or address to compare with S1
		-32768(h8000) to 32767(h7FFF)

Error	Zero	Carry	Borrow	Step
				5

<Ladder>



1. If the word value of S1 is less than or equal to that of
S2, it turns ON.
2. If the word value of S1 is greater than that of S2, it turns OFF.
3. Executes the Signed comparision.
(h8000(-32768) to hFFFF(-1) < 0 to h7FFF(32767))

Ex) LOAD<= H0001 H3456 → Comparision result: ON

LOAD<= HFF00 H3456 → Comparision result: OFF

3.2.38 Input comparison instruction(DLOAD=)

Input comparison instruction **DLOAD=** **S1** **S2**

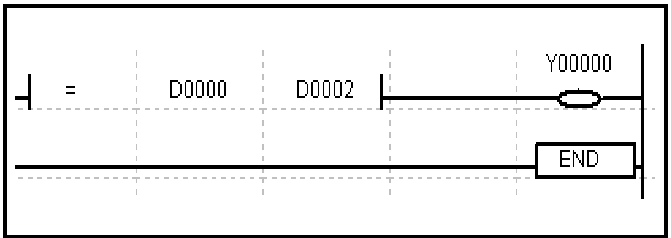
Applicable model

LP-S044, LP-S070

OP	DATA type	Available device / Description / Range
S1	DINT	X, Y, F, Z, T, C, M, S, L, D, UW, integer
		Data or address to compare with S2
		-2147483648(h80000000) to 2147483647(hFFFFFFFF)
S2	DINT	X, Y, F, Z, T, C, M, S, L, D, UW, integer
		Data or address to compare with S1
		-2147483648(h80000000) to 2147483647(hFFFFFFFF)

Error	Zero	Carry	Borrow	Step
				5

<Ladder>



1. If the double word values of S1 and S2 are equal, it turns ON.
2. If the double word values of S1 and S2 are not equal, it turns OFF.
3. Executes the Signed comparision.
(h80000000(-2147483648) to hFFFFFFFF(-1) <
0 to h7FFFFFFF(2147483647))

Ex) **DLOAD= H000100FF H34561000** Comparision result → **OFF**

DLOAD= H00014000 H00014000 Comparision result → **ON**

3.2.39 Input comparison instruction(DLOAD>)

Input comparison instruction **DLOAD>** **S1** **S2**

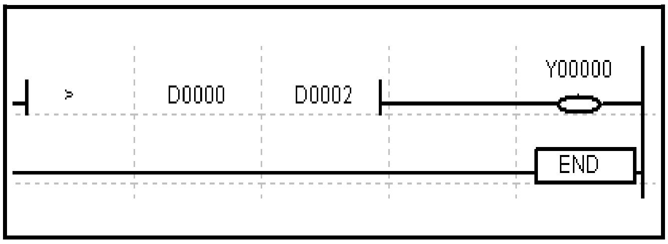
Applicable model

LP-S044, LP-S070

OP	DATA type	Available device / Description / Range
S1	DINT	X, Y, F, Z, T, C, M, S, L, D, UW, integer
		Data or address to compare with S2
		-2147483648(h80000000) to 2147483647(hFFFFFFFF)
S2	DINT	X, Y, F, Z, T, C, M, S, L, D, UW, integer
		Data or address to compare with S1
		-2147483648(h80000000) to 2147483647(hFFFFFFFF)

Error	Zero	Carry	Borrow	Step
				5

<Ladder>



1. If the double word value of S1 is greater than that of S2, it turns ON.
2. If the double word value of S1 is less than or equal to that of S2, it turns OFF.
3. Executes the Signed comparision.
(h80000000(-2147483648) to hFFFFFFFF(-1) < 0 to h7FFFFFFF(2147483647))

Ex)

Instruction	S1	S2	Comparision result
DLOAD>	H0001FFFF	H3456FFFF	OFF
DLOAD>	H0F5D0F0F	H00010F0F	ON

3.2.40 Input comparison instruction(DLOAD<)

Input comparison instruction **DLOAD<** **S1** **S2**

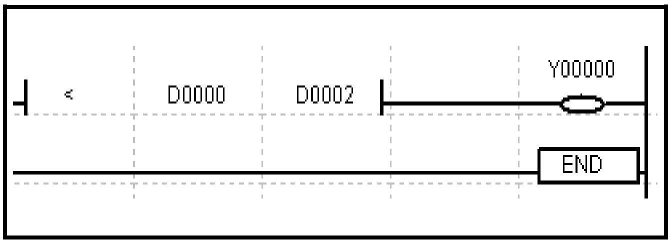
Applicable model

LP-S044, LP-S070

OP	DATA type	Available device / Description / Range
S1	DINT	X, Y, F, Z, T, C, M, S, L, D, UW, integer
		Data or address to compare with S2
		-2147483648(h80000000) to 2147483647(hFFFFFFFF)
S2	DINT	X, Y, F, Z, T, C, M, S, L, D, UW, integer
		Data or address to compare with S1
		-2147483648(h80000000) to 2147483647(hFFFFFFFF)

Error	Zero	Carry	Borrow	Step
				5

<Ladder>



1. If the double word value of S1 is less than that of S2, it turns ON.
2. If the double word value of S1 is greater than that of
S2, it turns OFF.
3. Executes the Signed comparision.
(h80000000(-2147483648) to hFFFFFFFF(-1) < 0 to h7FFFFFFF(2147483647))

Ex) DLOAD< H00013422 H3456DA12 — Comparision result → ON

DLOAD< H0F5D3321 H00010010 — Comparision result → OFF

3.2.41 Input comparison instruction(DLOAD<>)

Input comparison instruction **DLOAD<>** **S1** **S2**

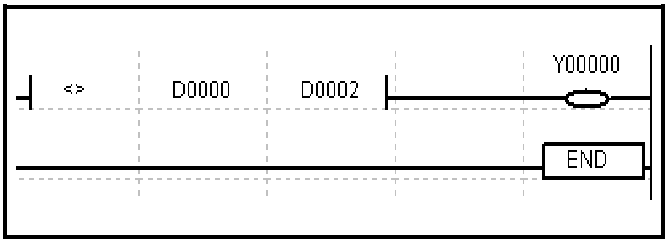
Applicable model

LP-S044, LP-S070

OP	DATA type	Available device / Description / Range
S1	DINT	X, Y, F, Z, T, C, M, S, L, D, UW, integer
		Data or address to compare with S2
		-2147483648(h80000000) to 2147483647(hFFFFFFFF)
S2	DINT	X, Y, F, Z, T, C, M, S, L, D, UW, integer
		Data or address to compare with S1
		-2147483648(h80000000) to 2147483647(hFFFFFFFF)

Error	Zero	Carry	Borrow	Step
				5

<Ladder>



1. If the double word values of S1 and S2 are not equal, it turns ON.
2. If the double word value of S1 and S2 are equal, it turns OFF.
3. Executes the Signed comparision.
(h80000000(-2147483648) to hFFFFFFFF(-1) <
0 to h7FFFFFFF(2147483647))

Ex)	DLOAD<> H0001239 H34562342	Comparision result →	ON
	DLOAD<> H0002DCD1 H0002DCD1	Comparision result →	OFF

3.2.42 Input comparison instruction(DLOAD>=)

Input comparison instruction **DLOAD>= S1 S2**

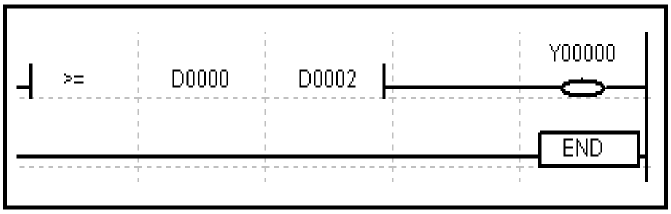
Applicable model

LP-S044, LP-S070

OP	DATA type	Available device / Description / Range
S1	DINT	X, Y, F, Z, T, C, M, S, L, D, UW, integer
		Data or address to compare with S2
		-2147483648(h80000000) to 2147483647(hFFFFFFFF)
S2	DINT	integer, *, Z, X, Y, M, D, L, F, T, C, UW
		Data or address to compare with S1
		-2147483648(h80000000) to 2147483647(hFFFFFFFF)

Error	Zero	Carry	Borrow	Step
				5

<Ladder>



1. If the double word value of S1 is greater than or equal to that of S2, it turns ON.
2. If the double word value of S1 is less than that of S2, it turns OFF.
3. Executes the Signed comparision.
(h80000000(-2147483648) to hFFFFFFFF(-1) < 0 to h7FFFFFFF(2147483647))

Ex)

DLOAD>= H00010000 H345632DD	Comparision result →	OFF
DLOAD>= H0F5DD123 H00010000	Comparision result →	ON

3.2.43 Input comparison instruction(DLOAD<=)

Input comparison instruction	DLOAD<=	S1	S2

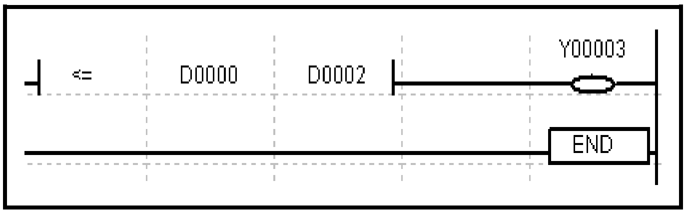
Applicable model

LP-S044, LP-S070

OP	DATA type	Available device / Description / Range
S1	DINT	X, Y, F, Z, T, C, M, S, L, D, UW, integer
		Data or address to compare with S2
		-2147483648(h80000000) to 2147483647(hFFFFFFFF)
S2	DINT	X, Y, F, Z, T, C, M, S, L, D, UW, integer
		Data or address to compare with S1
		-2147483648(h80000000) to 2147483647(hFFFFFFFF)

Error	Zero	Carry	Borrow	Step
				5

<Ladder>



1. If the double word value of S1 is less than or equal to that of S2, it turns ON.
2. If the double word value of S1 is greater than that of S2, it turns OFF.
3. Executes the Signed comparision.
(h80000000(-2147483648) to hFFFFFFFF(-1) < 0 to h7FFFFFFF(2147483647))

Ex)

DLOAD<=	H00010000	H34560000	Comparision result →	ON
DLOAD<=	HFF00AD12	H3456D567	Comparision result →	OFF

3.2.44 Input comparison instruction(AND=)

Input comparison instruction	AND=	S1	S2

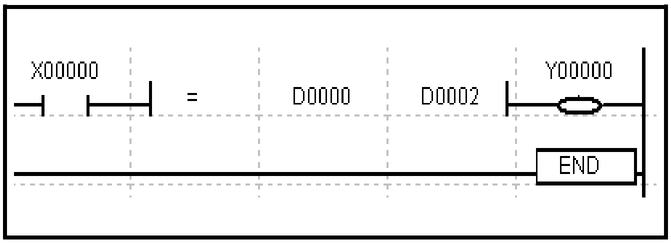
Applicable model

LP-S044, LP-S070

OP	DATA type	Available device / Description / Range
S1	INT	X, Y, F, Z, T, C, M, S, L, D, UW, integer
		Data or address to compare with S2
		-32768(h8000) to 32767(h7FFF)
S2	INT	X, Y, F, Z, T, C, M, S, L, D, UW, integer
		Data or address to compare with S1
		-32768(h8000) to 32767(h7FFF)

Error	Zero	Carry	Borrow	Step
				5

<Ladder>



1. If the word values of S1 and S2 are equal, it turns ON.
2. If the word values of S1 and S2 are not equal, it turns OFF.
3. Executes the Signed comparision.
(h8000(-32768) to hFFFF(-1) < 0 to h7FFF(32767))

Instruction	Condition	Comparision result
AND =	S1 = S2	ON

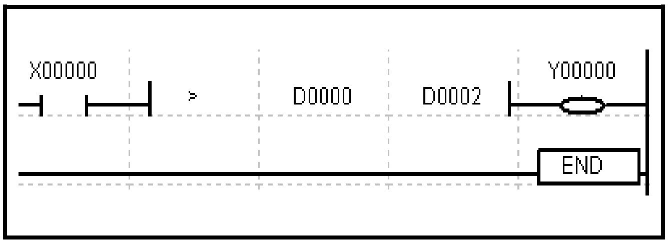
3.2.45 Input comparison instruction(AND>)

Input comparison instruction	AND>	S1	S2	Applicable model
				LP-S044, LP-S070

OP	DATA type	Available device / Description / Range
S1	INT	X, Y, F, Z, T, C, M, S, L, D, UW, integer
		Data or address to compare with S2
		-32768(h8000) to 32767(h7FFF)
S2	INT	X, Y, F, Z, T, C, M, S, L, D, UW, integer
		Data or address to compare with S1
		-32768(h8000) to 32767(h7FFF)

Error	Zero	Carry	Borrow	Step
				5

<Ladder>



1. If the word value of S1 is greater than that of S2, it turns ON.
2. If the word value of S1 is less than or equal to that of
S2, it turns OFF.
3. Executes the Signed comparision.
(h8000(-32768) to hFFFF(-1) < 0 to h7FFF(32767))

Instruction	Condition	Comparision result
AND >	S1 > S2	ON

3.2.46 Input comparison instruction(AND<)

Input comparison instruction	AND<	S1	S2

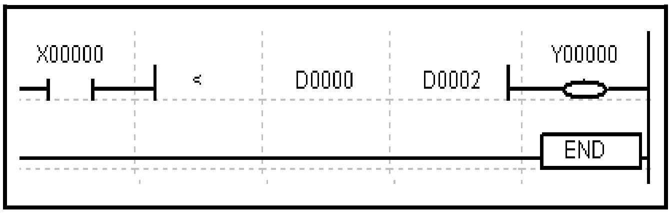
Applicable model

LP-S044, LP-S070

OP	DATA type	Available device / Description / Range
S1	INT	X, Y, F, Z, T, C, M, S, L, D, UW, integer
		Data or address to compare with S2
		-32768(h8000) to 32767(h7FFF)
S2	INT	X, Y, F, Z, T, C, M, S, L, D, UW, integer
		Data or address to compare with S1
		-32768(h8000) to 32767(h7FFF)

Error	Zero	Carry	Borrow	Step
				5

<Ladder>



1. If the word value of S1 is less than that of S2, it turns ON.
2. If the word value of S1 is greater than or equal to that of S2, it turns OFF.
3. Executes the Signed comparision.
(h8000(-32768) to hFFFF(-1) < 0 to h7FFF(32767))

Instruction	Condition	Comparision result
AND <	S1 < S2	ON

3.2.47 Input comparison instruction(AND<>)

Input comparison instruction **AND<>** **S1** **S2**

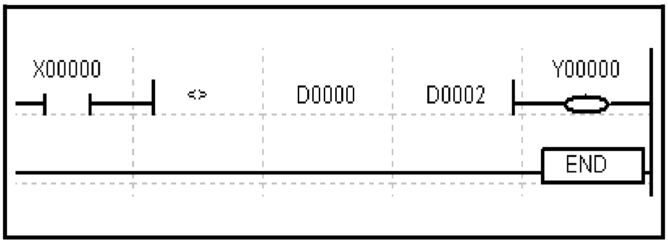
Applicable model

LP-S044, LP-S070

OP	DATA type	Available device / Description / Range
S1	INT	X, Y, F, Z, T, C, M, S, L, D, UW, integer
		Data or address to compare with S2
		-32768(h8000) to 32767(h7FFF)
S2	INT	X, Y, F, Z, T, C, M, S, L, D, UW, integer
		Data or address to compare with S1
		-32768(h8000) to 32767(h7FFF)

Error	Zero	Carry	Borrow	Step
				5

<Ladder>



1. If the word values of S1 and S2 are not equal, it turns ON.
2. If the word values of S1 and S2 are equal, it turns OFF.
3. Executes the Signed comparision.
(h8000(-32768) to hFFFF(-1) < 0 to h7FFF(32767))

Instruction	Condition	Comparision result
AND <>	S1 <> S2	ON

3.2.48 Input comparison instruction(AND>=)

Input comparison instruction	AND>=	S1	S2

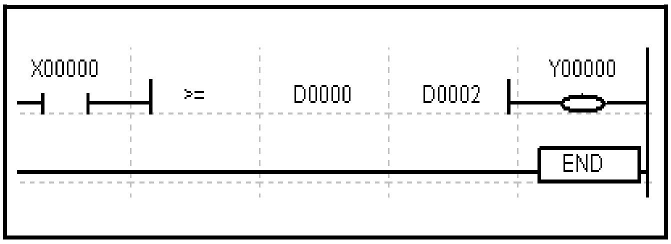
Applicable model

LP-S044, LP-S070

OP	DATA type	Available device / Description / Range
S1	INT	X, Y, F, Z, T, C, M, S, L, D, UW, integer
		Data or address to compare with S2
		-32768(h8000) to 32767(h7FFF)
S2	INT	X, Y, F, Z, T, C, M, S, L, D, UW, integer
		Data or address to compare with S1
		-32768(h8000) to 32767(h7FFF)

Error	Zero	Carry	Borrow	Step
				5

<Ladder>



1. If the word value of S1 is greater than or equal to that of S2, it turns ON.
2. If the word value of S1 is less than that of S2, it turns OFF.
3. Executes the Signed comparision.
(h8000(-32768) to hFFFF(-1) < 0 to h7FFF(32767))

Instruction	Condition	Comparision result
AND > =	S1 > = S2	ON

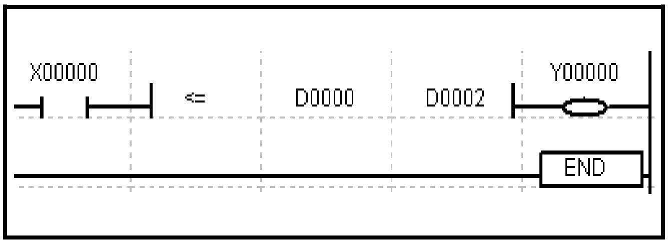
3.2.49 Input comparison instruction(AND<=)

Input comparison instruction	**AND<=**	**S1**	**S2**	Applicable model LP-S044, LP-S070

OP	DATA type	Available device / Description / Range
S1	INT	X, Y, F, Z, T, C, M, S, L, D, UW, integer
		Data or address to compare with S2
		-32768(h8000) to 32767(h7FFF)
S2	INT	X, Y, F, Z, T, C, M, S, L, D, UW, integer
		Data or address to compare with S1
		-32768(h8000) to 32767(h7FFF)

Error	Zero	Carry	Borrow	Step
				5

<Ladder>



1. If the word value of S1 is less than or equal to that of
S2, it turns ON.
2. If the word value of S1 is greater than that of S2, it turns OFF.
3. Executes the Signed comparision.
(h8000(-32768) to hFFFF(-1) < 0 to h7FFF(32767))

Instruction	Condition	Comparision result
AND <=	S1 <= S2	ON

3.2.50 Input comparison instruction(DAND=)

Input comparison instruction	DAND=	S1	S2

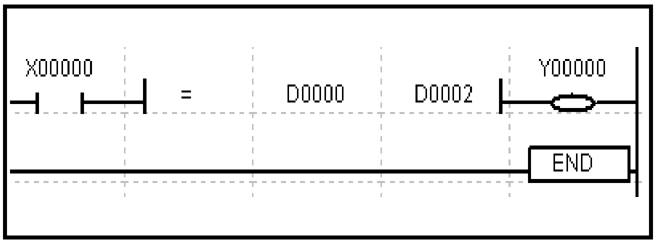
Applicable model

LP-S044, LP-S070

OP	DATA type	Available device / Description / Range
S1	DINT	X, Y, F, Z, T, C, M, S, L, D, UW, integer
		Data or address to compare with S2
		-2147483648(h80000000) to 2147483647(h7FFFFFFF)
S2	DINT	X, Y, F, Z, T, C, M, S, L, D, UW, integer
		Data or address to compare with S1
		-2147483648(h80000000) to 2147483647(h7FFFFFFF)

Error	Zero	Carry	Borrow	Step
				5

<Ladder>



1. If the double word values of S1 and S2 are equal, it turns ON.
2. If the double word values of S1 and S2 are not equal, it turns OFF.
3. Executes the Signed comparision.
(h80000000(-2147483648) to hFFFFFFFF(-1) < 0 to h7FFFFFFF(2147483647))

Instruction	Condition	Comparision result
DAND =	S1 = S2	ON

3.2.51 Input comparison instruction(DAND>)

Input comparison instruction **DAND>** **S1** **S2**

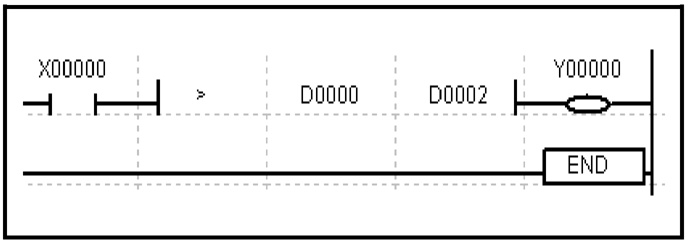
Applicable model

LP-S044, LP-S070

OP	DATA type	Available device / Description / Range
S1	DINT	X, Y, F, Z, T, C, M, S, L, D, UW, integer
		Data or address to compare with S2
		-2147483648(h80000000) to 2147483647(hFFFFFFFF)
S2	DINT	X, Y, F, Z, T, C, M, S, L, D, UW, integer
		Data or address to compare with S1
		-2147483648(h80000000) to 2147483647(hFFFFFFFF)

Error	Zero	Carry	Borrow	Step
				5

<Ladder>



1. If the double word value of S1 is greater than that of S2, it turns ON.
2. If the double word value of S1 is less than or equal to that of S2, it turns OFF. .
3. Executes the Signed comparision.
(h80000000(-2147483648) to hFFFFFFFF(-1) < 0 to h7FFFFFFF(2147483647))

Instruction	Condition	Comparision result
DAND >	S1 > S2	ON

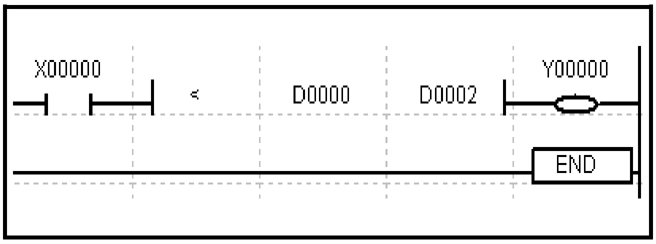
3.2.52 Input comparison instruction(DAND<)

Input comparison instruction	DAND<	S1	S2	Applicable model
				LP-S044, LP-S070

OP	DATA type	Available device / Description / Range
S1	DINT	X, Y, F, Z, T, C, M, S, L, D, UW, integer
		Data or address to compare with S2
		-2147483648(h80000000) to 2147483647(hFFFFFFFF)
S2	DINT	X, Y, F, Z, T, C, M, S, L, D, UW, integer
		Data or address to compare with S1
		-2147483648(h80000000) to 2147483647(hFFFFFFFF)

Error	Zero	Carry	Borrow	Step
				5

<Ladder>



1. If the double word value of S1 is less than that of S2, it turns ON.
2. If the double word value of S1 is greater than or equal to that of S2, it turns OFF.
3. Executes the Signed comparision.
(h80000000(-2147483648) to hFFFFFFFF(-1) <
0 to h7FFFFFFF(2147483647))

Instruction	Condition	Comparision result
DAND <	S1 < S2	ON

3.2.53 Input comparison instruction(DAND<>)

Input comparison instruction **DAND<>** **S1** **S2**

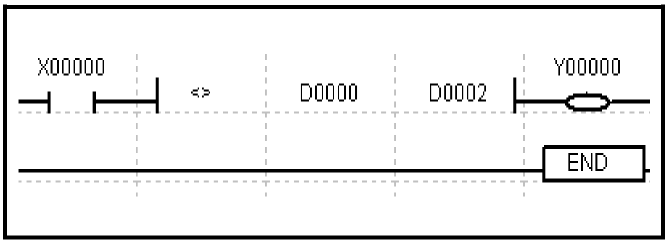
Applicable model

LP-S044, LP-S070

OP	DATA type	Available device / Description / Range
S1	DINT	X, Y, F, Z, T, C, M, S, L, D, UW, integer
		Data or address to compare with S2
		-2147483648(h80000000) to 2147483647(hFFFFFFFF)
S2	DINT	X, Y, F, Z, T, C, M, S, L, D, UW, integer
		Data or address to compare with S1
		-2147483648(h80000000) to 2147483647(hFFFFFFFF)

Error	Zero	Carry	Borrow	Step
				5

<Ladder>



1. If the double word values of S1 and S2 are not equal, it turns ON.
2. If the double word values of S1 and S2 are equal, it turns OFF.
3. Executes the Signed comparision.
(h80000000(-2147483648) to hFFFFFFFF(-1) < 0 to h7FFFFFFF(2147483647))

Instruction	Condition	Comparision result
DAND <>	S1 <> S2	ON

3.2.54 Input comparison instruction(DAND>=)

Input comparison instruction **DAND>=** **S1** **S2**

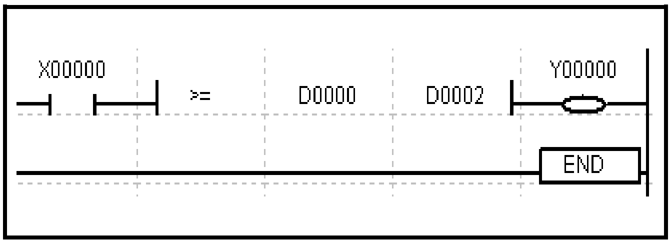
Applicable model

LP-S044, LP-S070

OP	DATA type	Available device / Description / Range
S1	DINT	X, Y, F, Z, T, C, M, S, L, D, UW, integer
		Data or address to compare with S2
		-2147483648(h80000000) to 2147483647(hFFFFFFFF)
S2	DINT	X, Y, F, Z, T, C, M, S, L, D, UW, integer
		Data or address to compare with S1
		-2147483648(h80000000) to 2147483647(hFFFFFFFF)

Error	Zero	Carry	Borrow	Step
				5

<Ladder>



1. If the double word value of S1 is greater than or equal to that of S2, it turns ON.
2. If the double word value of S1 is less than that of S2, it turns OFF.
3. Executes the Signed comparision.
(h80000000(-2147483648) to hFFFFFFFF(-1) < 0 to h7FFFFFFF(2147483647))

Instruction	Condition	Comparision result
DAND >=	S1 >= S2	ON

3.2.55 Input comparison instruction(DAND<=)

Input comparison instruction **DAND<=** **S1** **S2**

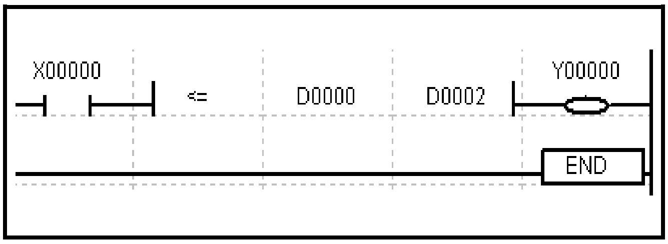
Applicable model

LP-S044, LP-S070

OP	DATA type	Available device / Description / Range
S1	DINT	X, Y, F, Z, T, C, M, S, L, D, UW, integer
		Data or address to compare with S2
		-2147483648(h80000000) to 2147483647(hFFFFFFFF)
S2	DINT	X, Y, F, Z, T, C, M, S, L, D, UW, integer
		Data or address to compare with S1
		-2147483648(h80000000) to 2147483647(hFFFFFFFF)

Error	Zero	Carry	Borrow	Step
				5

<Ladder>



1. If the double word value of S1 is less than or equal to that of S2, it turns ON.
2. If the double word value of S1 is greater than that of
S2, it turns OFF.
3. Executes the Signed comparision.
(h80000000(-2147483648) to hFFFFFFFF(-1) <
0 to h7FFFFFFF(2147483647))

Instruction	Condition	Comparision
DAND <=	S1 <= S2	ON

3.2.56 Input comparison instruction(OR=)

Input comparison instruction **OR=** **S1** **S2**

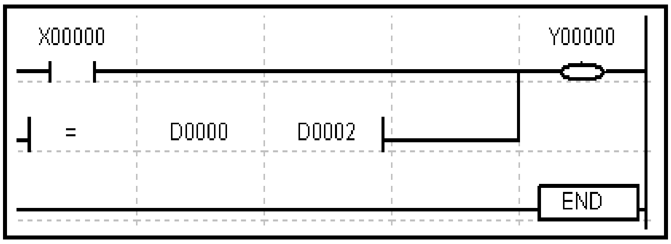
Applicable model

LP-S044, LP-S070

OP	DATA type	Available device / Description / Range
S1	INT	X, Y, F, Z, T, C, M, S, L, D, UW, integer
		Data or address to compare with S2
		-32768(h8000) to 32767(h7FFF)
S2	INT	X, Y, F, Z, T, C, M, S, L, D, UW, integer
		Data or address to compare with S1
		-32768(h8000) to 32767(h7FFF)

Error	Zero	Carry	Borrow	Step
				5

<Ladder>



1. If the word value of S1 is equal to that of S2, it turns ON.
2. If the word value of S1 is not equal to that of S2, it turns OFF.
3. Executes the Signed comparision.
(h8000(-32768) to hFFFF(-1) < 0 to h7FFF(32767))

Instruction	Condition	Comparision
OR =	S1 = S2	ON

3.2.57 Input comparison instruction(OR>)

Input comparison instruction	OR>	S1	S2

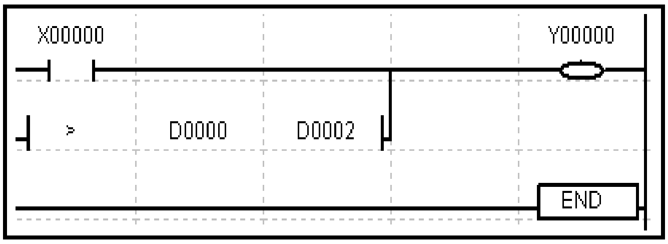
Applicable model

LP-S044, LP-S070

OP	DATA type	Available device / Description / Range
S1	INT	X, Y, F, Z, T, C, M, S, L, D, UW, integer
		Data or address to compare with S2
		-32768(h8000) to 32767(h7FFF)
S2	INT	X, Y, F, Z, T, C, M, S, L, D, UW, integer
		Data or address to compare with S1
		-32768(h8000) to 32767(h7FFF)

Error	Zero	Carry	Borrow	Step
				5

<Ladder>



1. If the word value of S1 is greater than that of S2, it turns ON.
2. If the word value of S1 is less than or equal to that of S2, it turns OFF.
3. Executes the Signed comparision.
(h8000(-32768) to hFFFF(-1) < 0 to h7FFF(32767))

Instruction	Condition	Comparision
OR >	S1 > S2	ON

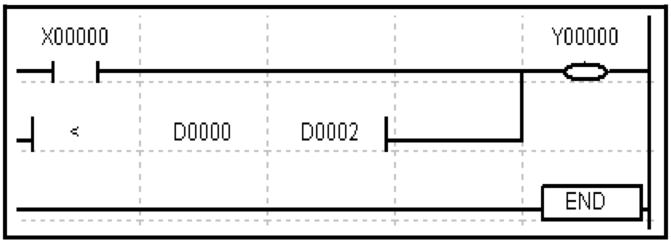
3.2.58 Input comparison instruction(OR<)

Input comparison instruction	OR<	S1	S2	Applicable model
				LP-S044, LP-S070

OP	DATA type	Available device / Description / Range
S1	INT	X, Y, F, Z, T, C, M, S, L, D, UW, integer
		Data or address to compare with S2
		-32768(h8000) to 32767(h7FFF)
S2	INT	X, Y, F, Z, T, C, M, S, L, D, UW, integer
		Data or address to compare with S1
		-32768(h8000) to 32767(h7FFF)

Error	Zero	Carry	Borrow	Step
				5

<Ladder>



1. If the word value of S1 is less than that of S2, it turns ON.
2. If the word value of S1 is greater than or equal to that of S2, it turns OFF.
3. Executes the Signed comparision.
(h8000(-32768) to hFFFF(-1) < 0 to h7FFF(32767))

Instruction	Condition	Comparision
OR <	S1 < S2	ON

3.2.59 Input comparison instruction(OR<>)

Input comparison instruction	OR<>	S1	S2

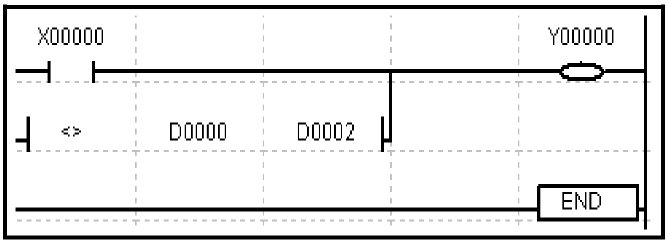
Applicable model

LP-S044, LP-S070

OP	DATA type	Available device / Description / Range
S1	INT	X, Y, F, Z, T, C, M, S, L, D, UW, integer
		Data or address to compare with S2
		-32768(h8000) to 32767(h7FFF)
S2	INT	X, Y, F, Z, T, C, M, S, L, D, UW, integer
		Data or address to compare with S1
		-32768(h8000) to 32767(h7FFF)

Error	Zero	Carry	Borrow	Step
				5

<Ladder>



1. If the word value of S1 is not equal to that of S2, it turns ON.
2. If the word value of S1 is equal to that of S2, it turns OFF.
3. Executes the Signed comparision.
(h8000(-32768) to hFFFF(-1) < 0 to h7FFF(32767))

Instruction	Condition	Comparision
OR <>	S1 <> S2	ON

3.2.60 Input comparison instruction(OR>=)

Input comparison instruction	OR>=	S1	S2

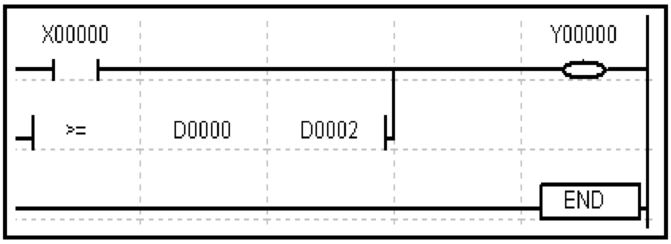
Applicable model

LP-S044, LP-S070

OP	DATA type	Available device / Description / Range
S1	INT	X, Y, F, Z, T, C, M, S, L, D, UW, integer
		Data or address to compare with S2
		-32768(h8000) to 32767(h7FFF)
S2	INT	X, Y, F, Z, T, C, M, S, L, D, UW, integer
		Data or address to compare with S1
		-32768(h8000) to 32767(h7FFF)

Error	Zero	Carry	Borrow	Step
				5

<Ladder>



1. If the word value of S1 is greater than or equal to that of S2, it turns ON.
2. If the word value of S1 is less than that of S2, it turns OFF.
3. Executes the Signed comparision.
(h8000(-32768) to hFFFF(-1) < 0 to h7FFF(32767))

Instruction	Condition	Comparision
OR >=	S1 >= S2	ON

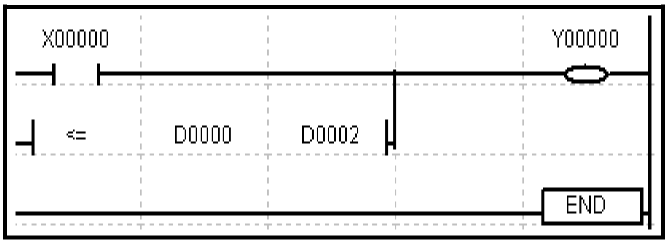
3.2.61 Input comparison instruction(OR<=)

Input comparison instruction	OR<=	S1	S2	Applicable model
				LP-S044, LP-S070

OP	DATA type	Available device / Description / Range
S1	INT	X, Y, F, Z, T, C, M, S, L, D, UW, integer
		Data or address to compare with S2
		-32768(h8000) to 32767(h7FFF)
S2	INT	X, Y, F, Z, T, C, M, S, L, D, UW, integer
		Data or address to compare with S1
		-32768(h8000) to 32767(h7FFF)

Error	Zero	Carry	Borrow	Step
				5

<Ladder>



1. If the word value of S1 is less than or equal to that of S2, it turns ON.
2. If the word value of S1 is greater than that of S2, it turns OFF.
3. Executes the Signed comparision.
(h8000(-32768) to hFFFF(-1) < 0 to h7FFF(32767))

Instruction	Condition	Comparision
OR <=	S1 <= S2	ON

3.2.62 Input comparison instruction(DOR=)

Input comparison instruction	DOR=	S1	S2

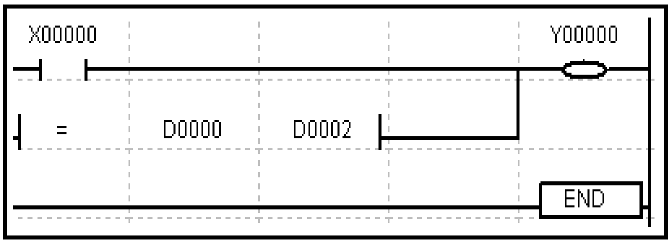
Applicable model

LP-S044, LP-S070

OP	DATA type	Available device / Description / Range
S1	DINT	X, Y, F, Z, T, C, M, S, L, D, UW, integer
		Data or address to compare with S2
		-2147483648(h80000000) to 2147483647(h7FFFFFFF)
S2	DINT	X, Y, F, Z, T, C, M, S, L, D, UW, integer
		Data or address to compare with S1
		-2147483648(h80000000) to 2147483647(h7FFFFFFF)

Error	Zero	Carry	Borrow	Step
				5

<Ladder>



1. If the double word value of S1 is equal to that of S2, it turns ON.
2. If the double word value of S1 is not equal to that of S2, it turns OFF.
3. Executes the Signed comparision.
(h80000000(-2147483648) to hFFFFFFFF(-1) <
0 to h7FFFFFFF(2147483647))

Instruction	Condition	Comparision
DOR =	S1 = S2	ON

3.2.63 Input comparison instruction(DOR>)

Input comparison instruction	DOR>	S1	S2

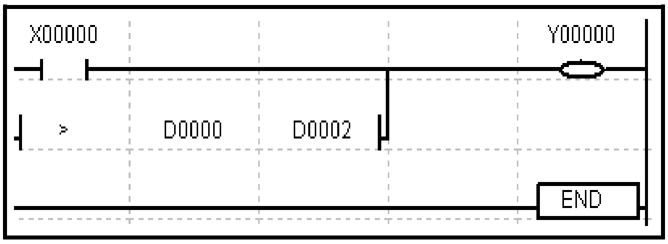
Applicable model

LP-S044, LP-S070

OP	DATA type	Available device / Description / Range
S1	DINT	X, Y, F, Z, T, C, M, S, L, D, UW, integer
		Data or address to compare with S2
		-2147483648(h80000000) to 2147483647(h7FFFFFFF)
S2	DINT	X, Y, F, Z, T, C, M, S, L, D, UW, integer
		Data or address to compare with S1
		-2147483648(h80000000) to 2147483647(h7FFFFFFF)

Error	Zero	Carry	Borrow	Step
				5

<Ladder>



1. If the double word value of S1 is greater than that of
S2, it turns ON.
2. If the double word value of S1 is less than or equal to that of S2, it turns OFF.
3. Executes the Signed comparision.
(h80000000(-2147483648) to hFFFFFFFF(-1) <
0 to h7FFFFFFF(2147483647))

Instruction	Condition	Comparision
DOR >	S1 > S2	ON

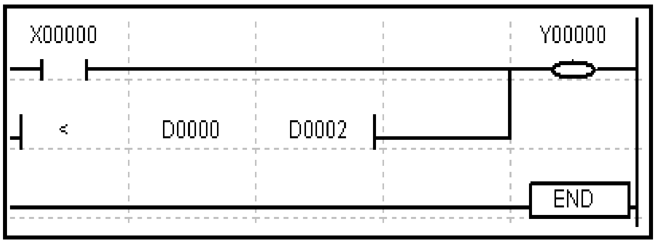
3.2.64 Input comparison instruction(DOR<)

Input comparison instruction	DOR<	S1	S2	Applicable model
				LP-S044, LP-S070

OP	DATA type	Available device / Description / Range
S1	DINT	X, Y, F, Z, T, C, M, S, L, D, UW, integer
		Data or address to compare with S2
		-2147483648(h80000000) to 2147483647(h7FFFFFFF)
S2	DINT	X, Y, F, Z, T, C, M, S, L, D, UW, integer
		Data or address to compare with S1
		-2147483648(h80000000) to 2147483647(h7FFFFFFF)

Error	Zero	Carry	Borrow	Step
				5

<Ladder>



1. If the double word value of S1 is less than that of S2, it turns ON.
2. If the double word value of S1 is greater than or equal to that of S2, it turns OFF.
3. Executes the Signed comparision.
(h80000000(-2147483648) to hFFFFFFFF(-1) < 0 to h7FFFFFFF(2147483647))

Instruction	Condition	Comparision
DOR <	S1 < S2	ON

3.2.65 Input comparison instruction(DOR<>)

Input comparison instruction **DOR<>** **S1** **S2**

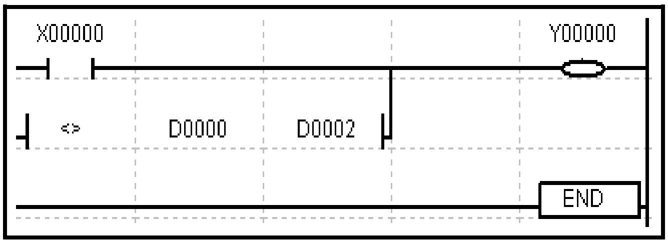
Applicable model

LP-S044, LP-S070

OP	DATA type	Available device / Description / Range
S1	DINT	X, Y, F, Z, T, C, M, S, L, D, UW, integer
		Data or address to compare with S2
		-2147483648(h80000000) to 2147483647(h7FFFFFFF)
S2	DINT	X, Y, F, Z, T, C, M, S, L, D, UW, integer
		Data or address to compare with S1
		-2147483648(h80000000) to 2147483647(h7FFFFFFF)

Error	Zero	Carry	Borrow	Step
				5

<Ladder>



1. If the double word value of S1 is not equal to that of S2, it turns ON.
2. If the double word value of S1 is equal to that of S2, it turns OFF.
3. Executes the Signed comparision.
(h80000000(-2147483648) to hFFFFFFFF(-1) < 0 to h7FFFFFFF(2147483647))

Instruction	Condition	Comparision
DOR <>	S1 <> S2	ON

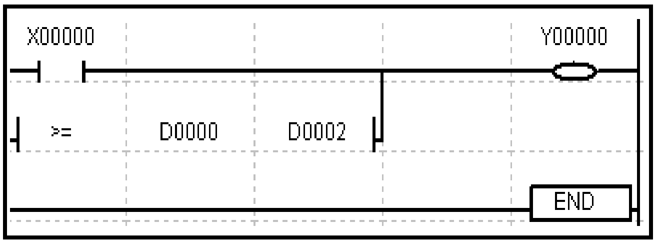
3.2.66 Input comparison instruction(DOR>=)

Input comparison instruction	DOR>=	S1	S2	Applicable model
				LP-S044, LP-S070

OP	DATA type	Available device / Description / Range
S1	DINT	X, Y, F, Z, T, C, M, S, L, D, UW, integer
		Data or address to compare with S2
		-2147483648(h80000000) to 2147483647(h7FFFFFFF)
S2	DINT	X, Y, F, Z, T, C, M, S, L, D, UW, integer
		Data or address to compare with S1
		-2147483648(h80000000) to 2147483647(h7FFFFFFF)

Error	Zero	Carry	Borrow	Step
				5

<Ladder>



1. If the double word value of S1 is greater than or equal to that of S2, it turns ON.
2. If the double word value of S1 is less than that of S2, it turns OFF.
3. Executes the Signed comparision.
(h80000000(-2147483648) to hFFFFFFFF(-1) < 0 to h7FFFFFFF(2147483647))

Instruction	Condition	Comparision
DOR > =	S1 > = S2	ON

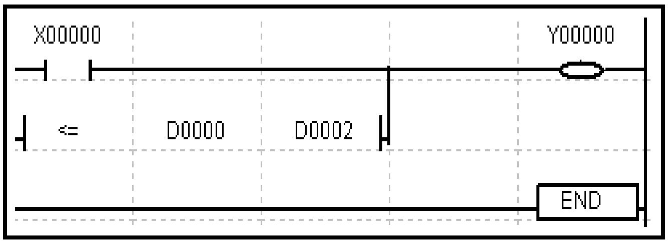
3.2.67 Input comparison instruction(DOR<=)

Input comparison instruction	DOR<=	S1	S2	Applicable model
				LP-S044, LP-S070

OP	DATA type	Available device / Description / Range
S1	DINT	X, Y, F, Z, T, C, M, S, L, D, UW, integer
		Data or address to compare with S2
		-2147483648(h80000000) to 2147483647(h7FFFFFFF)
S2	DINT	X, Y, F, Z, T, C, M, S, L, D, UW, integer
		Data or address to compare with S1
		-2147483648(h80000000) to 2147483647(h7FFFFFFF)

Error	Zero	Carry	Borrow	Step
				5

<Ladder>



1. If the double word value of S1 is less than or equal to that of S2, it turns ON.
2. If the double word value of S1 is greater than that of
S2, it turns OFF.
3. Executes the Signed comparision.
(h80000000(-2147483648) to hFFFFFFFF(-1) <
0 to h7FFFFFFF(2147483647))

Instruction	Condition	Comparision
DOR <=	S1 <= S2	ON

3.2.68 Comparison instruction(CMP)

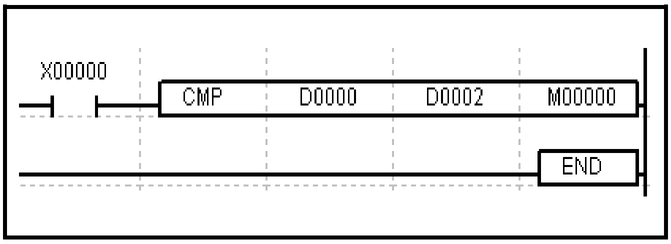
Comparison instruction **CMP** **S1** **S2** **D**

Applicable model
LP-S044, LP-S070

OP	DATA type	Available device / Description / Range
S1	INT	X, Y, F, Z, T, C, M, S, L, D, UW, integer
		Data or address to compare with S2
		-32768(h8000) to 32767(h7FFF)
S2	INT	X, Y, F, Z, T, C, M, S, L, D, UW, integer
		Data or address to compare with S1
		-32768(h8000) to 32767(h7FFF)
D	BIT	Y, M, UB
		Lead address of bit device to save the comparision result
		Not applicable

Error	Zero	Carry	Borrow	Step
				7

<Ladder>



Compares the word value of S1 with that of S2. The result is as below :

1. If S1 < S2, D bit turns ON.
2. If S1 = S2, D+1 bit turns ON.
3. If S1> S2, D+2 bit turns ON.
4. Comparision executes the Signed operation. (h8000(-32768) to h7FFF(-1) < 0 to h7FFF(32767))

3.2.69 Comparison instruction(DCMP)

Comparison instruction **DCMP** **S1** **S2** **D**

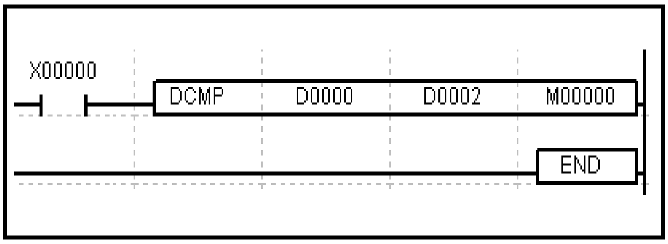
Applicable model

LP-S044, LP-S070

OP	DATA type	Available device / Description / Range
S1	DINT	X, Y, F, Z, T, C, M, S, L, D, UW, integer
		Data or address to compare with S2
		-2147483648(h80000000) to 2147483647(h7FFFFFFF)
S2	DINT	X, Y, F, Z, T, C, M, S, L, D, UW, integer
		Data or address to compare with S1
		-2147483648(h80000000) to 2147483647(h7FFFFFFF)
D	BIT	Y, M, UB
		Lead address of bit device to save the comparision result
		Not applicable

Error	Zero	Carry	Borrow	Step
				7

<Ladder>



Compares the double word value of S1 with that of S2. The result is as below :

1. If S1 < S2, D bit turns ON.
2. If S1 = S2, D+1 bit turns ON.
3. If S1 > S2, D+2 bit turns ON.
4. Comparision executes the Signed operation.

(h8000(-32768) to h7FFF(-1) < 0 to h7FFF(32767))

3.2.70 Comparison instruction(ACMP)

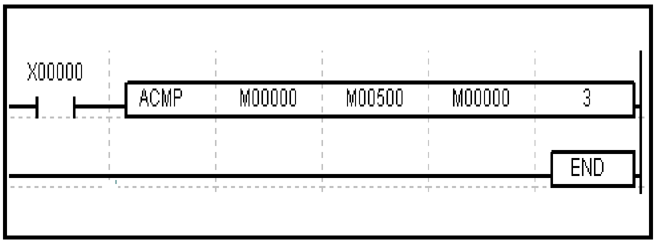
Comparison instruction	ACMP	S1	S2	D	N

Applicable model
LP-S044, LP-S070

OP	DATA type	Available device / Description / Range
S1	BIT	X, Y, F, T, C, M, UB
		Lead address of data or bit device to compare with S2
		Not applicable
S2	BIT	X, Y, F, T, C, M, UB
		Lead address of data or bit device to compare with S1
		Not applicable
D	BIT	Y, M, UB
		Lead address of bit device to save the comparision result
		Not applicable
N	WORD	X, Y, F, Z, T, C, M, S, L, D, UW, integer
		The number of devices to compare
		1 to 32

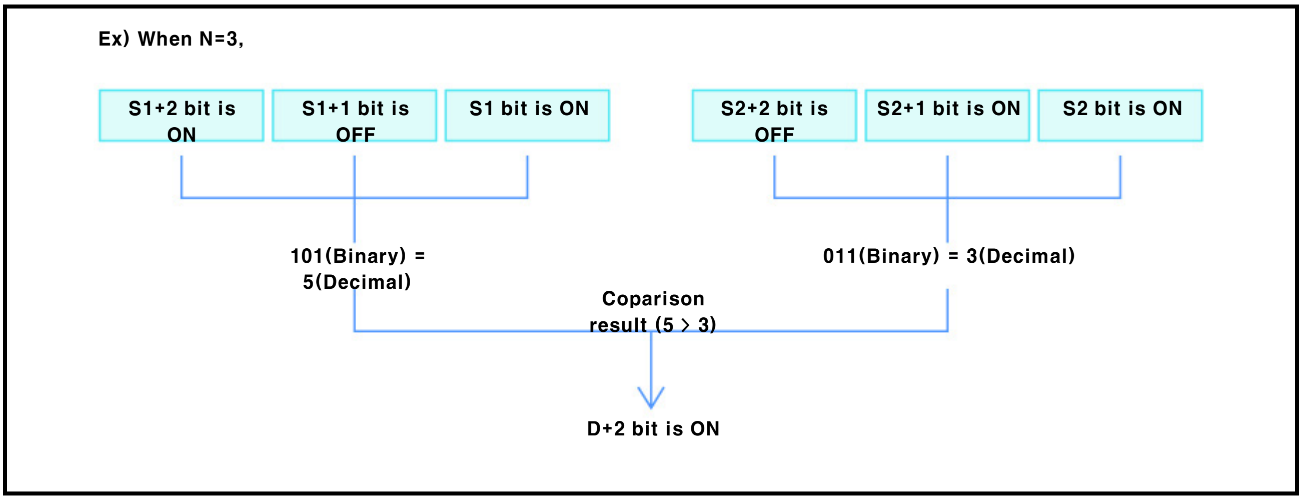
Error	Zero	Carry	Borrow	Step
				7

<Ladder>



Compares the number of N bit values beginning with S1 bit with the number of N bit values beginning with S2 bit. As a result :

1. If S1 < S2, D bit turns ON.
2. If S1==S2, D+1 bit turns ON.
3. If S1>S2, D+2 bit turns ON.



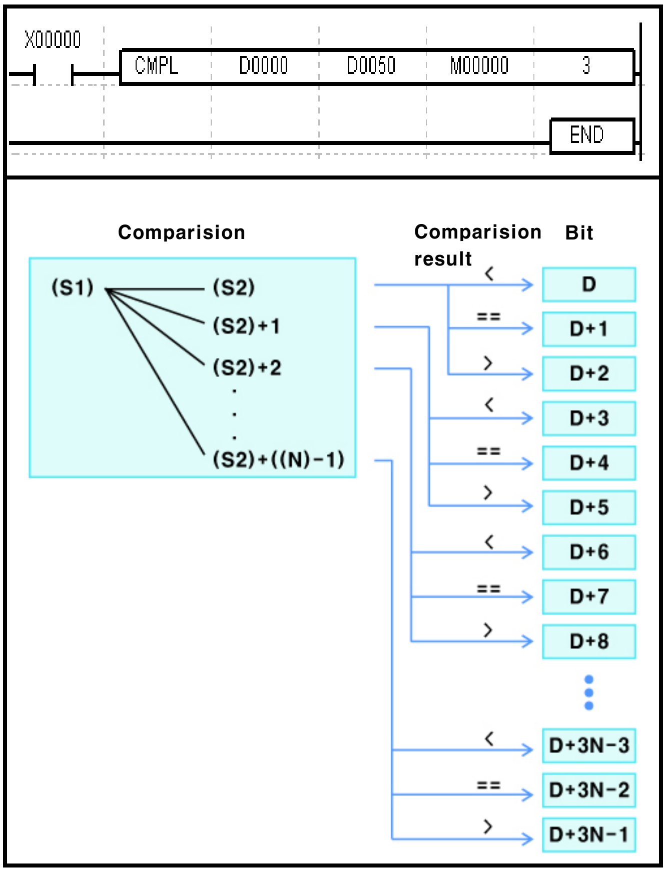
3.2.71 Comparison instruction(CMPL)

Comparison instruction	CMPL	S1	S2	D	N	Applicable model LP-S044, LP-S070

OP	DATA type	Available device / Description / Range
S1	INT	X, Y, F, Z, T, C, M, S, L, D, UW, integer
		Data or data address to compare with S2
		-32768(h8000) to 32767(hFFFF)
S2	INT	X, Y, F, Z, T, C, M, S, L, D, UW, integer
		Data or data address to compare with S1
		-32768(h8000) to 32767(hFFFF)
D	BIT	Y, M, UB
		Lead address of bit device to save comparision result
		Not applicable
N	WORD	X, Y, F, Z, T, C, M, S, L, D, UW, integer
		The number of S2 data to compare with S1 data
		As many as the number of devices remained in S1, S2 and D area

Error	Zero	Carry	Borrow	Step
				9

<Ladder>



Compares the word value of S1 with the number of N word values beginning with S2 word. As a result :

1. If S1 < S2, D bit turns ON.
2. If S1 == S2, D+1 bit turns ON.
3. If S1 > S2, D+2 bit turns ON.

The comparison result of S2+1 is stored in bits from D+3 to D+5, like this way, the operation results are sequentially stored in D bits.

4. Comparision executes the Signed operation. (h8000(-32768) to hFFFF(-1) < 0 to h7FFF(32767))

3.2.72 Comparison instruction(DCMPL)

Comparison instruction **DCMPL** **S1** **S2** **D** **N**

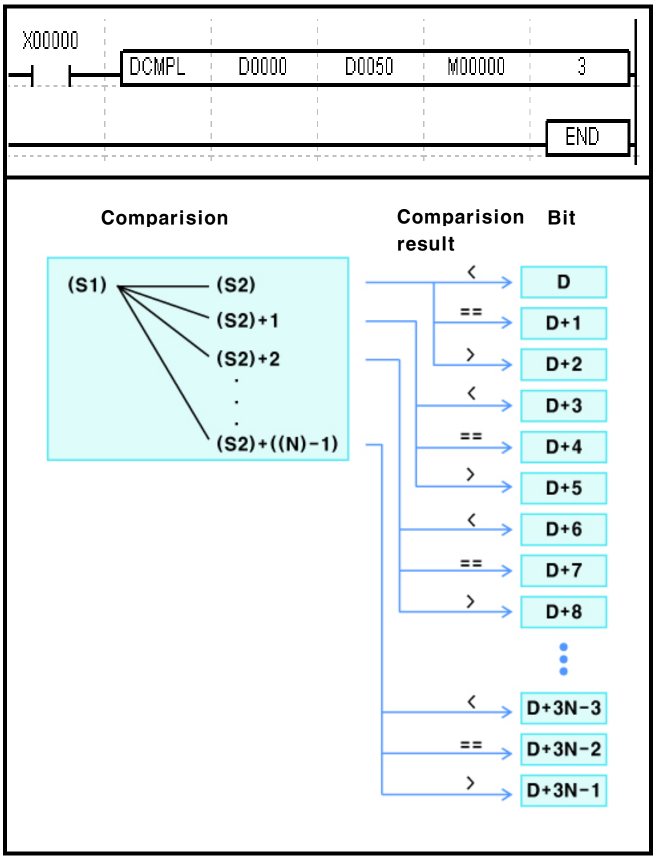
Applicable model

LP-S044, LP-S070

OP	DATA type	Available device / Description / Range
S1	DINT	X, Y, F, Z, T, C, M, S, L, D, UW, integer
		Data or data address to compare with S2
		-2147483648(h80000000) to 2147483647(h7FFFFFFF)
S2	DINT	X, Y, F, Z, T, C, M, S, L, D, UW, integer
		Data or data address to compare with S1
		-2147483648(h80000000) to 2147483647(h7FFFFFFF)
D	BIT	Y, M, UB
		Lead address of bit device to save comparision result
		Not applicable
N	WORD	X, Y, F, Z, T, C, M, S, L, D, UW, integer
		The number of S2 data to compare with S1 data
		As many as the number of devices remained in S1, S2 and D area

Error	Zero	Carry	Borrow	Step
				9

<Ladder>



Compares the double word S1 with the number of N double words beginning with double word S2. As a result :

1. If S1 < S2, D bit turns ON.
2. If S1 == S2, D+1 bit turns ON.
3. If S1 > S2, D+2 bit turns ON.

The comparison result of S2+1 is stored in bits from D+3 to D+5, like this way, the operation results are sequentially stored in D bits.

4. Comparision executes the Signed operation. (h80000000(-2147483648) to hFFFFFFFF(-1) < 0 to h7FFFFFFF(2147483647))

3.2.73 Comparison instruction(BWCMP)

Comparison instruction	BWCMP	S1	S2	S3	D

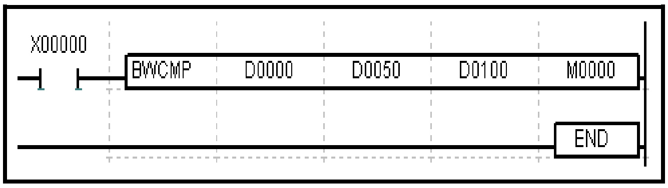
Applicable model

LP-S044, LP-S070

OP	DATA type	Available device / Description / Range
S1	INT	X, Y, M, S, T, C, D, Z, F, UW, integer
		Data to compare with S2 and S3
		-32768(h8000) to 32767(h7FFF)
S2	INT	X, Y, M, S, T, C, D, Z, F, UW, integer
		Data to compare with S1 and S3
		-32768(h8000) to 32767(h7FFF)
S3	INT	X, Y, M, S, T, C, D, Z, F, UW, integer
		Data to compare with S1 and S2
		-32768(h8000) to 32767(h7FFF)
D	BIT	Y, M, UB
		Bit device address to save comparision result
		Not applicable

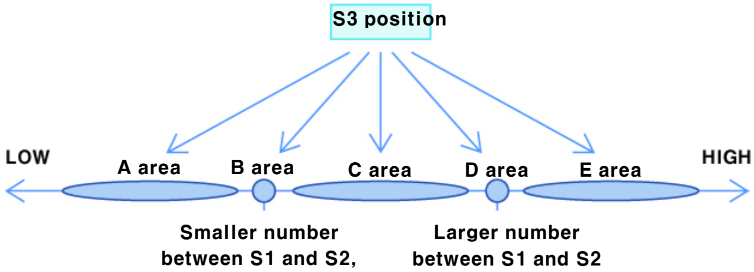
Error	Zero	Carry	Borrow	Step
				9

<Ladder>



Compare word value of S3 with the limited area between S1 and S2 word values. As a result :

1. If the value of S3 is less than the smaller value of the two(S1, S2), D bit turns ON.
2. If the value of S3 is equal to the smaller value of the two, D+1 bit turns ON.
3. If the value of S3 is located between the two values, D+2 bit turns ON.
4. If the value of S3 is equal to the larger value of the two, D+3 bit turns ON.
5. If the value of S3 is greater than the larger value of the two, D+4 bit turns ON.
6. Comparision executes the Signed operation.



If S3 position is
- A area, D bit is ON
- B area, D+1 bit is ON
- C area, D+2 bit is ON
- D area, D+3 bit is ON
- E area, D+4 bit is ON

Ex) In case of S3=h3300, S1=h1011, S2=h2020,

0	0	0	0	0
D+4	D+3	D+2	D+1	D

→ S3 is placed at E area. Therefore D+4 bit is ON

1	0	0	0	0
D+4	D+3	D+2	D+1	D

3.2.74 Comparison instruction(DBWCMP)

Comparison instruction **DBWCMP** **S1** **S2** **S3** **D**

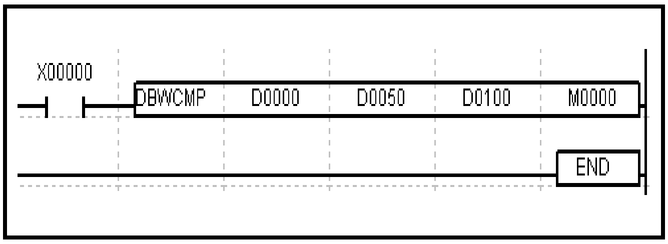
Applicable model

LP-S044, LP-S070

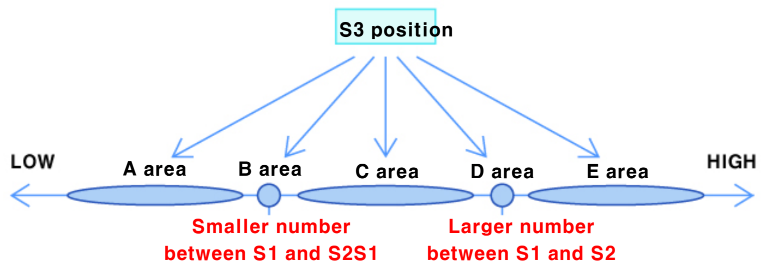
OP	DATA type	Available device / Description / Range
S1	DINT	X, Y, M, S, T, C, D, Z, F, UW, integer
		Data to compare with S2 and S3
		-2147483648(h80000000) to 2147483647(h7FFFFFFF)
S2	DINT	X, Y, M, S, T, C, D, Z, F, UW, integer
		Data to compare with S1 and S3
		-2147483648(h80000000) to 2147483647(h7FFFFFFF)
S3	DINT	X, Y, M, S, T, C, D, Z, F, UW, integer
		Data to compare with S1 and S2
		-2147483648(h80000000) to 2147483647(h7FFFFFFF)
D	BIT	Y, M, UB
		Bit device address to save comparision result
		Not applicable

Error	Zero	Carry	Borrow	Step
				9

<Ladder>



Compares the double word value of S3 with the limited
area between S1 and S2 word values.
As a result :
1. If the value of S3 is less than the smaller value of the two(S1, S2), D bit turns ON.
2. If the value of S3 is equal to the smaller value of the
two, D+1 bit turns ON.
3. If the value of S3 is located between the two values,
D+2 bit turns ON.
4. If the value of S3 is equal to the larger value of the two, D+3 bit turns ON.
5. If the value of S3 is greater than the larger value of the two, D+4 bit turns ON.
6. Comparision executes the Signed operation.



If S3 position is

- A area, D bit is ON
- B area, D+1 bit is ON
- C area, D+2 bit is ON
- D area, D+3 bit is ON
- E area, D+4 bit is ON

Ex) In case of S3=h33003300, S1=h10000111, S2=h2020FF00,

0	0	0	0	0
D+4	D+3	D+2	D+1	D

→ S3 is placed at E area. Therefore D+4 bit is ON

1	0	0	0	0
D+4	D+3	D+2	D+1	D

3.2.75 Transmission instruction(BMOV)

Transmission instruction **BMOV** **S** **D**

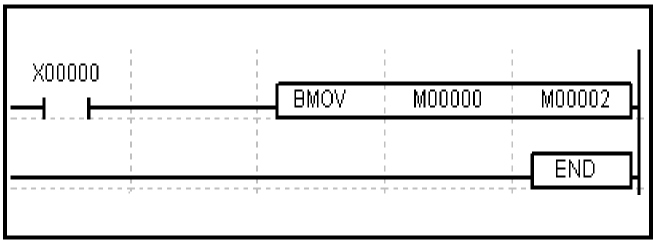
Applicable model

LP-S044, LP-S070

OP	DATA type	Available device / Description / Range
S	BIT	X, Y, F, T, C, M, UB
		Bit device number you want to transmit
		Not applicable
D	BIT	Y, F, T, C, M, UB
		Bit device address to save the transmitted data
		Not applicable

Error	Zero	Carry	Borrow	Step
				5

<Ladder>



Transmits the source bit to the destination bit.

3.2.76 Transmission instruction(MOV)

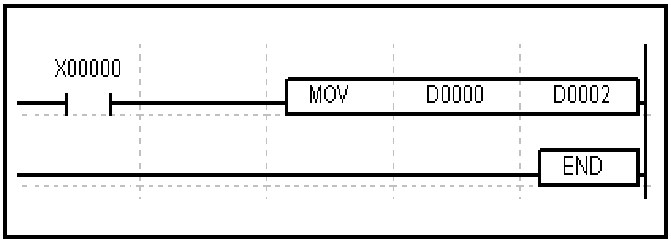
Transmission instruction **MOV** **S** **D**

Applicable model
LP-S044, LP-S070

OP	DATA type	Available device / Description / Range
S	WORD	X, Y, F, Z, T, C, M, S, L, D, UW, integer
		Data to transmit or device number which have the data
		0(h0000) to 65535(hFFFF)
D	WORD	Y, F, Z, T, C, M, S, L, D, UW
		Device number to save transmitted data
		0(h0000) to 65535(hFFFF)

Error	Zero	Carry	Borrow	Step
				5

<Ladder>



Transmits the source word to the destination word.

3.2.77 Transmission instruction(DMOV)

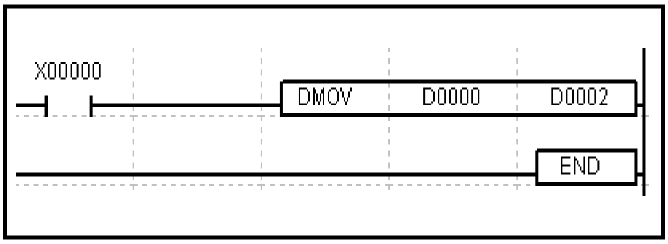
Transmission instruction **DMOV** **S** **D**

Applicable model
LP-S044, LP-S070

OP	DATA type	Available device / Description / Range
S	DWORD	X, Y, F, Z, T, C, M, S, L, D, UW, integer
		Data to transmit or device number which have the data
		0(h0000) to 4294967295(hFFFFFFFF)
D	DWORD	Y, F, Z, T, C, M, S, L, D, UW
		Device number to save transmitted data
		0(h0000) to 4294967295(hFFFFFFFF)

Error	Zero	Carry	Borrow	Step
				5

<Ladder>



Transmits the source double word to the destination double word.

3.2.78 Transmission instruction(BMOVL)

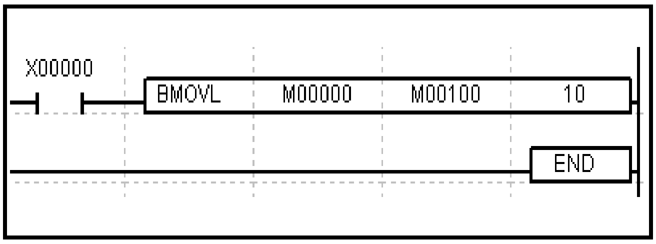
Transmission instruction **BMOVL** **S** **D** **N**

Applicable model
LP-S044, LP-S070

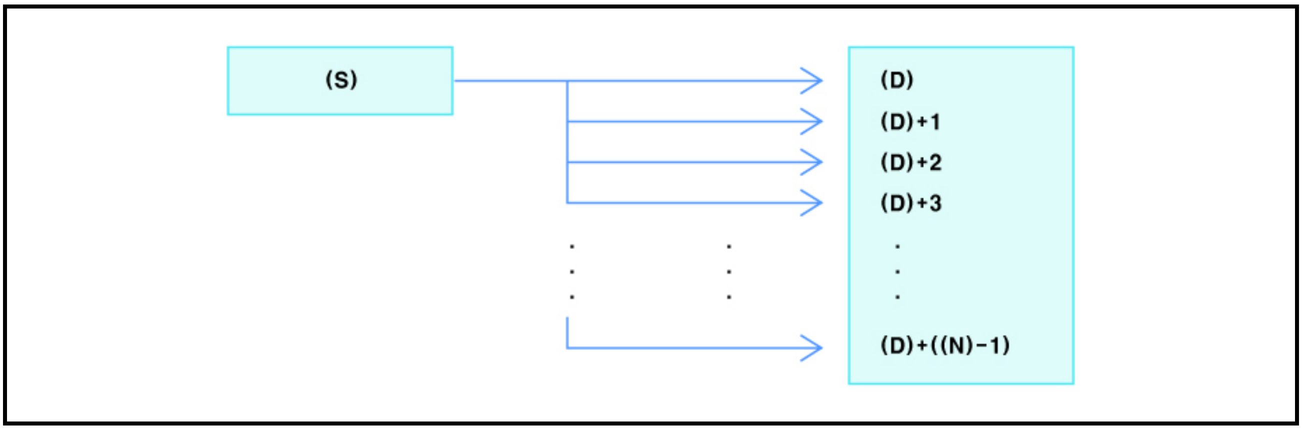
OP	DATA type	Available device / Description / Range
S	BIT	X, Y, F, T, C, M, UB
		Bit device number you want to transmit
		Not applicable
D	BIT	Y, F, T, C, M, UB
		Bit device address to save the transmitted data
		Not applicable
N	WORD	X, Y, F, Z, T, C, M, S, L, D, UW, integer
		The number of destination bit devices to save the transmitted data
		To the remained devices in corresponding D area

Error	Zero	Carry	Borrow	Step
				7

<Ladder>



Transmits the source bit to the number of N bits beginning with D, one by one.



3.2.79 Transmission instruction(MOVL)

Transmission instruction **MOVL** **S** **D** **N**

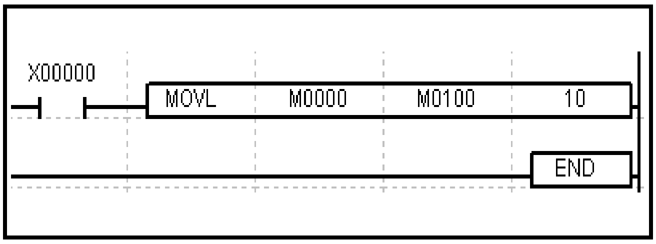
Applicable model

LP-S044, LP-S070

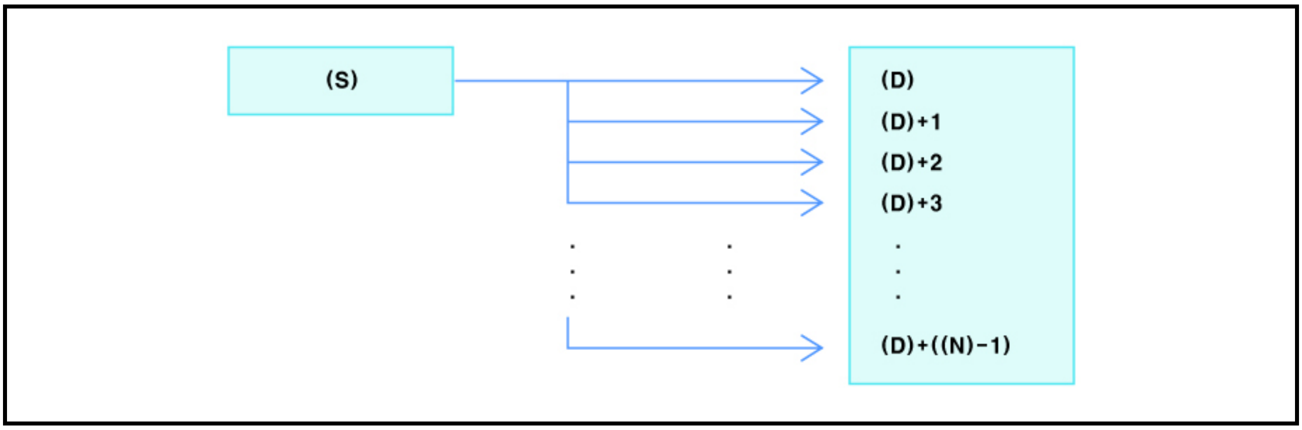
OP	DATA type	Available device / Description / Range
S	WORD	X, Y, F, Z, T, C, M, S, L, D, UW, integer
		Data to transmit or device number which have the data
		0(h0000) to 65535(hFFFF)
D	WORD	Y, F, Z, T, C, M, S, L, D, UW
		Device number to save transmitted data
		0(h0000) to 65535(hFFFF)
N	WORD	X, Y, F, Z, T, C, M, S, L, D, UW, integer
		The number of destination bit devices to save the transmitted data
		To the remained devices in corresponding D area

Error	Zero	Carry	Borrow	Step
				7

<Ladder>



Transmits the source word to the number of N words beginning with D, one by one.



3.2.80 Transmission instruction(DMOVL)

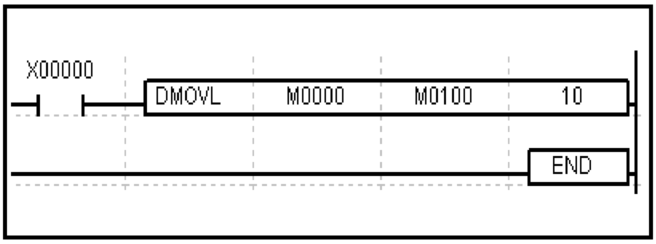
Transmission instruction **DMOVL** **S** **D** **N**

Applicable model
LP-S044, LP-S070

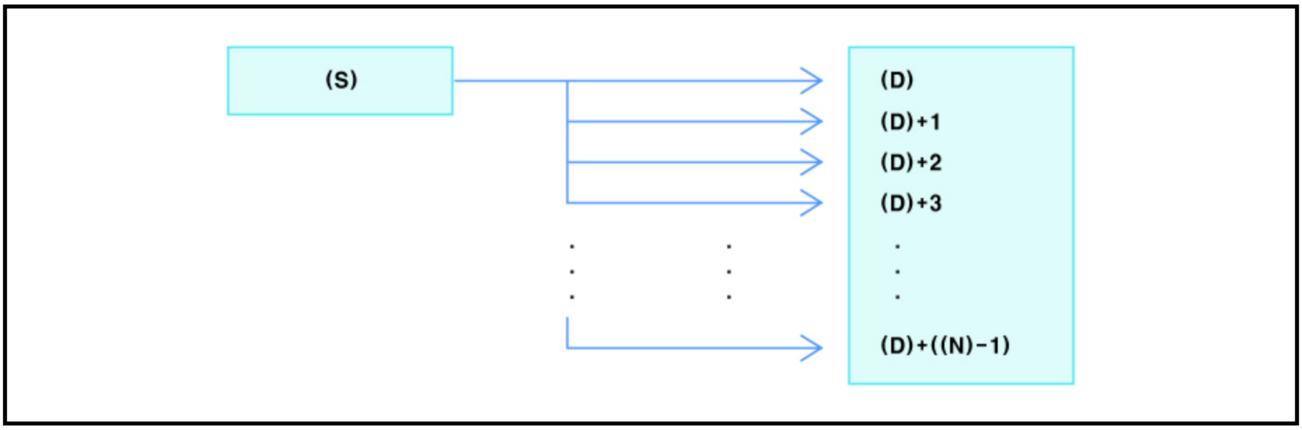
OP	DATA type	Available device / Description / Range
S	DWORD	X, Y, F, Z, T, C, M, S, L, D, UW, integer
		Data to transmit or device number which have the data
		0(h0000) to 4294967295(hFFFFFFFF)
D	DWORD	Y, F, Z, T, C, M, S, L, D, UW
		Device number to save transmitted data
		0(h0000) to 4294967295(hFFFFFFFF)
N	WORD	X, Y, F, Z, T, C, M, S, L, D, UW, integer
		The number of destination bit devices to save the transmitted data
		To the remained devices in corresponding D area

Error	Zero	Carry	Borrow	Step
				7

<Ladder>



Transmit the source double word to the number of N double words beginning with D, one by one.



3.2.81 Transmission instruction(BMOVG)

Transmission instruction	BMOVG	S	D	N

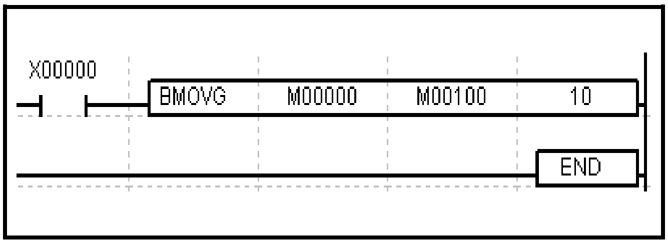
Applicable model

LP-S044, LP-S070

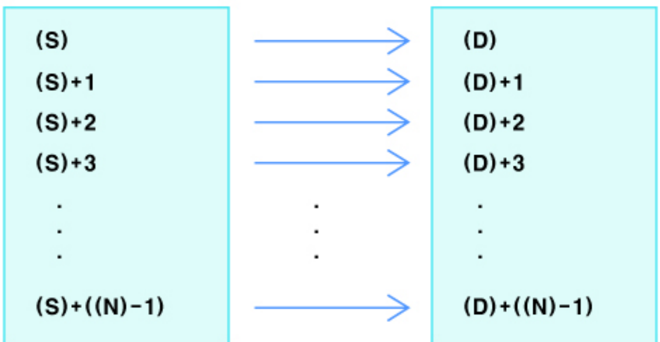
OP	DATA type	Available device / Description / Range
S	BIT	X, Y, F, T, C, M, UB
		Bit device number you want to transmit
		Not applicable
D	BIT	Y, F, T, C, M, UB
		Bit device address to save the transmitted data
		Not applicable
N	WORD	X, Y, F, Z, T, C, M, S, L, D, UW, integer
		The number of bit devices to save to be transmitted data and the transmitted data
		To the remained devices in corresponding S, D areas

Error	Zero	Carry	Borrow	Step
				7

<Ladder>



Transmits the number of N bit groups beginning with (S) to the number of N bit groups beginning with (D), in batches.



3.2.82 Transmission instruction(MOVG)

Transmission instruction **MOVG** **S** **D** **N**

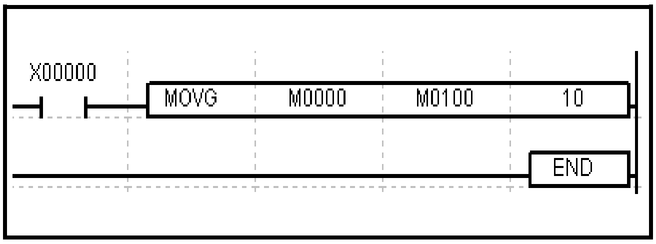
Applicable model

LP-S044, LP-S070

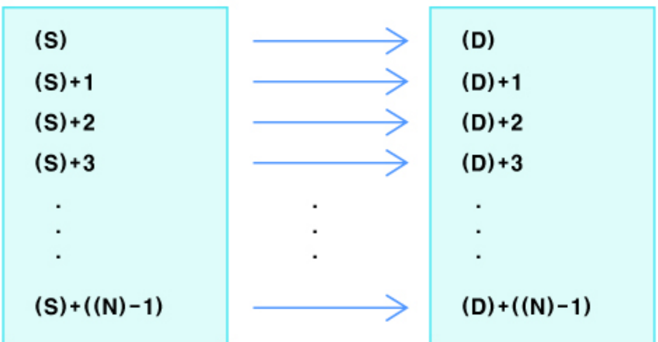
OP	DATA type	Available device / Description / Range
S	WORD	X, Y, F, Z, T, C, M, S, L, D, UW
		Data to transmit or device number which have the data
		0(h0000) to 65535(hFFFF)
D	WORD	Y, F, Z, T, C, M, S, L ,D, UW
		Device number to save transmitted data
		0(h0000) to 65535(hFFFF)
N	WORD	X, Y, F, Z, T, C, M, S, L, D, UW, integer
		The number of bit devices to save to be transmitted data and the transmitted data
		To the remained devices in corresponding S, D areas

Error	Zero	Carry	Borrow	Step
				7

<Ladder>



Transmit the number of N word groups beginning with (S), to the number of N word groups beginning with (D), in batches.



3.2.83 Transmission instruction(DMOVG)

Transmission instruction **DMOVG** **S** **D** **N**

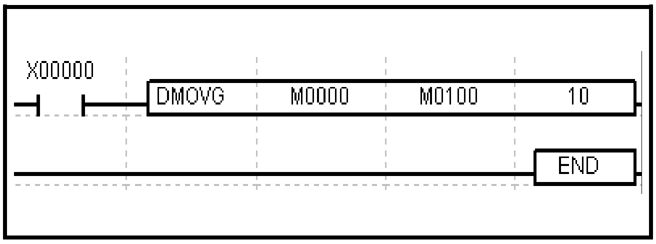
Applicable model

LP-S044, LP-S070

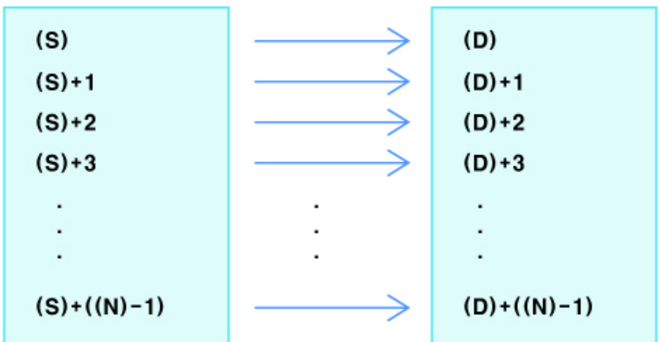
OP	DATA type	Available device / Description / Range
S	DWORD	X, Y, F, Z, T, C, M, S, L, D ,UW
		Data to transmit or device number which have the data
		0(h0000) to 4294967295(hFFFFFFFF)
D	DWORD	Y, F, Z, T, C, M, S, L, D ,UW
		Device number to save transmitted data
		0(h0000) to 4294967295(hFFFFFFFF)
N	WORD	X, Y, F, Z, T, C, M, S, L, D ,UW, integer
		The number of bit devices to save to be transmitted data and the transmitted data
		To the remained devices in corresponding S, D areas

Error	Zero	Carry	Borrow	Step
				7

<Ladder>



Transmit the number of N double word groups beginning with (S) to the number of N double word groups beginning with (D), in batches.



3.2.84 Transmission instruction(BCMOV)

Transmission instruction	BCMOV	S	D

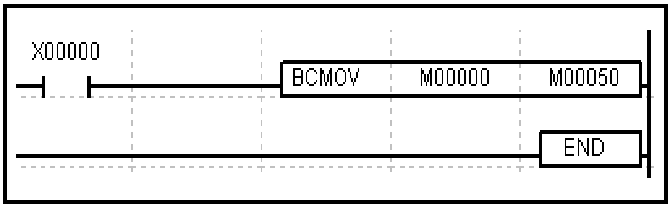
Applicable model

LP-S044, LP-S070

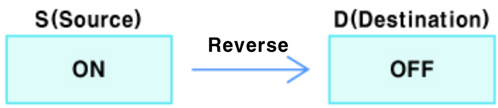
OP	DATA type	Available device / Description / Range
S	BIT	X, Y, F, T, C, M, UB
		Bit device number you want to transmit
		Not applicable
D	BIT	Y, F, T, C, M, UB
		Bit device address to save the transmitted data
		Not applicable

Error	Zero	Carry	Borrow	Step
				5

<Ladder>



Reverses the source device and then transmits it to the destination bit.



3.2.85 Transmission instruction(CMOV)

Transmission instruction **CMOV** **S** **D**

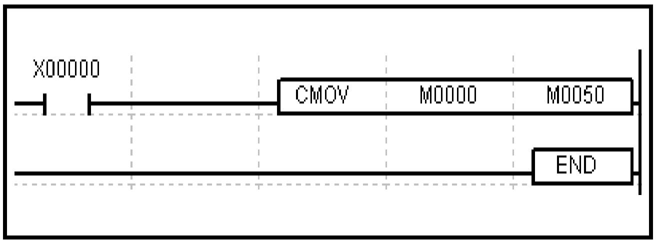
Applicable model

LP-S044, LP-S070

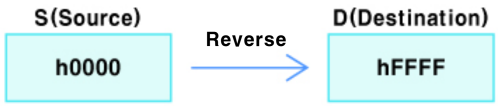
OP	DATA type	Available device / Description / Range
S	WORD	X, Y, F, Z, T, C, M, S, L, D, UW, integer
		Data to transmit or device number which have the data
		0(h0000) to 65535(hFFFF)
D	WORD	Y, F, Z, T, C, M, S, L, D, UW
		Device number to save transmitted data
		0(h0000) to 65535(hFFFF)

Error	Zero	Carry	Borrow	Step
				5

<Ladder>



Reverses the source word and then transmits it to the destination word.



3.2.86 Transmission instruction(DCMOV)

Transmission instruction **DCMOV** **S** **D**

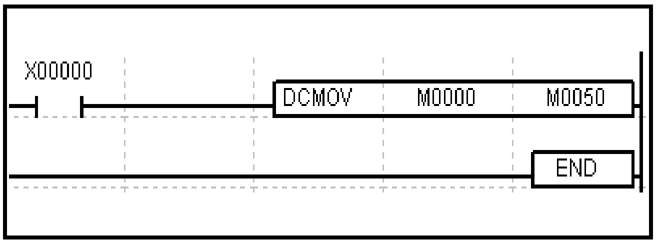
Applicable model

LP-S044, LP-S070

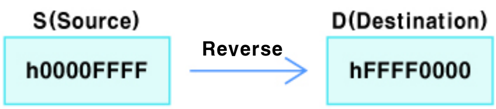
OP	DATA type	Available device / Description / Range
S	DWORD	X, Y, F, Z, T, C, M, S, L, D, UW, integer
		Data to transmit or device number which have the data
		0(h0000) to 4294967295(hFFFFFFFF)
D	DWORD	Y, F, Z, T, C, M, S, L, D, UW
		Device number to save transmitted data
		0(h0000) to 4294967295(hFFFFFFFF)

Error	Zero	Carry	Borrow	Step
				5

<Ladder>



Reverses the source double word and then transmits it to the destination double word.



3.2.87 Exchange instruction(XCH)

Exchange instruction **XCH** **S1** **S2**

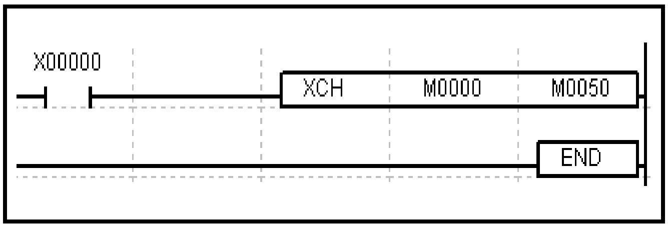
Applicable model

LP-S044, LP-S070

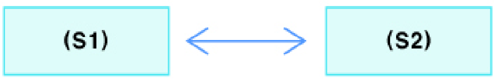
OP	DATA type	Available device / Description / Range
S1	WORD	Y, F, Z, T, C, M, S, L, D, UW
		Data device number to be exchanged
		0(h0000) to 65535(hFFFF)
S2	WORD	Y, F, Z, T, C, M, S, L, D, UW
		Data device number to be exchanged
		0(h0000) to 65535(hFFFF)

Error	Zero	Carry	Borrow	Step
				5

<Ladder>



Exchanges a data in S1 word and a data in S2 word each other.



3.2.88 Exchange instruction(DXCH)

Exchange instruction **DXCH** **S1** **S2**

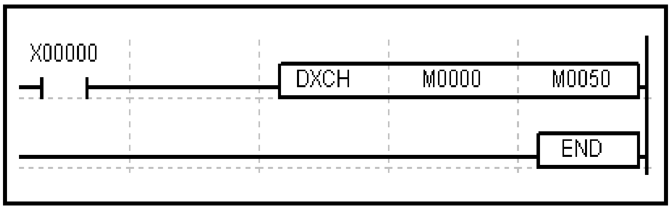
Applicable model

LP-S044, LP-S070

OP	DATA type	Available device / Description / Range
S1	DWORD	Y, F, Z, T, C, M, S, L, D, UW
		Data device number to be exchanged
		0(h0000) to 4294967295(hFFFFFFFF)
S2	DWORD	Y, F, Z, T, C, M, S, L, D, UW
		Data device number to be exchanged
		0(h0000) to 4294967295(hFFFFFFFF)

Error	Zero	Carry	Borrow	Step
				5

<Ladder>



Exchanges a data in the double word S1 and a data in the double word S2 each other.

3.2.89 Exchange instruction(AXCH)

Exchange instruction	AXCH	S1	S2	N

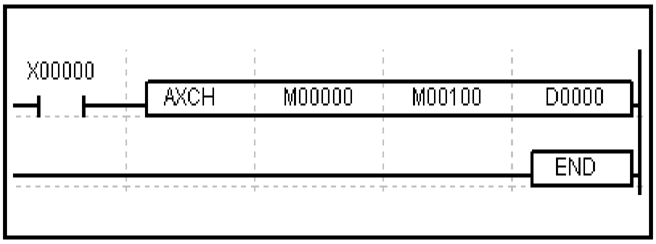
Applicable model

LP-S044, LP-S070

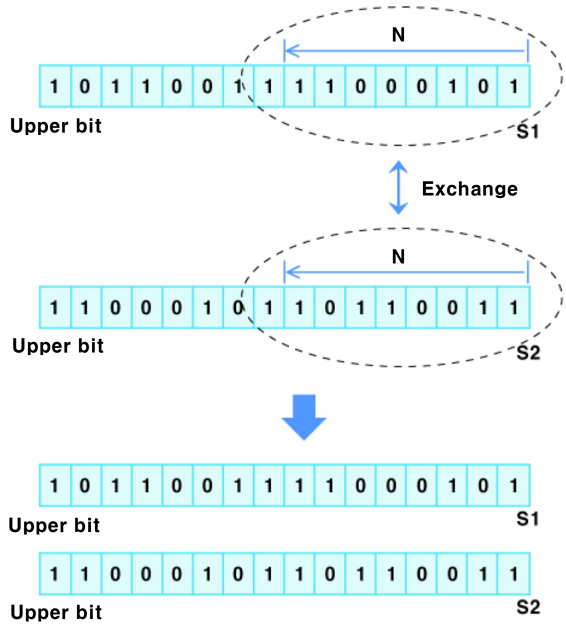
OP	DATA type	Available device / Description / Range
S1	BIT	Y, F, T, C, M, UB
		Bit device address of the data to be exchanged
		Not applicable
S2	BIT	Y, F, T, C, M, UB
		Bit device address of the data to be exchanged
		Not applicable
N	WORD	Y, F, Z, T, C, M, S, L, D, UW, integer
		The number of the data bits to be exchanged
		To the device range remained in corresponding S1 and S2 areas.

Error	Zero	Carry	Borrow	Step
				7

<Ladder>



Exchanges the number of N bits beginning with S1 with the number of N bits beginning from S2 each other.



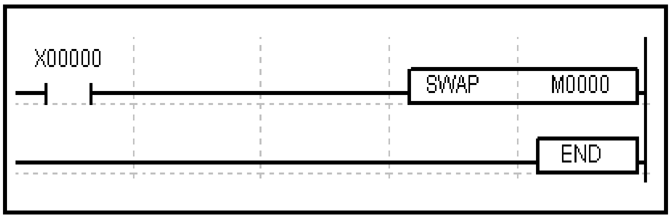
3.2.90 Exchange instruction(SWAP)

Exchange instruction	SWAP	D	Applicable model LP-S044, LP-S070

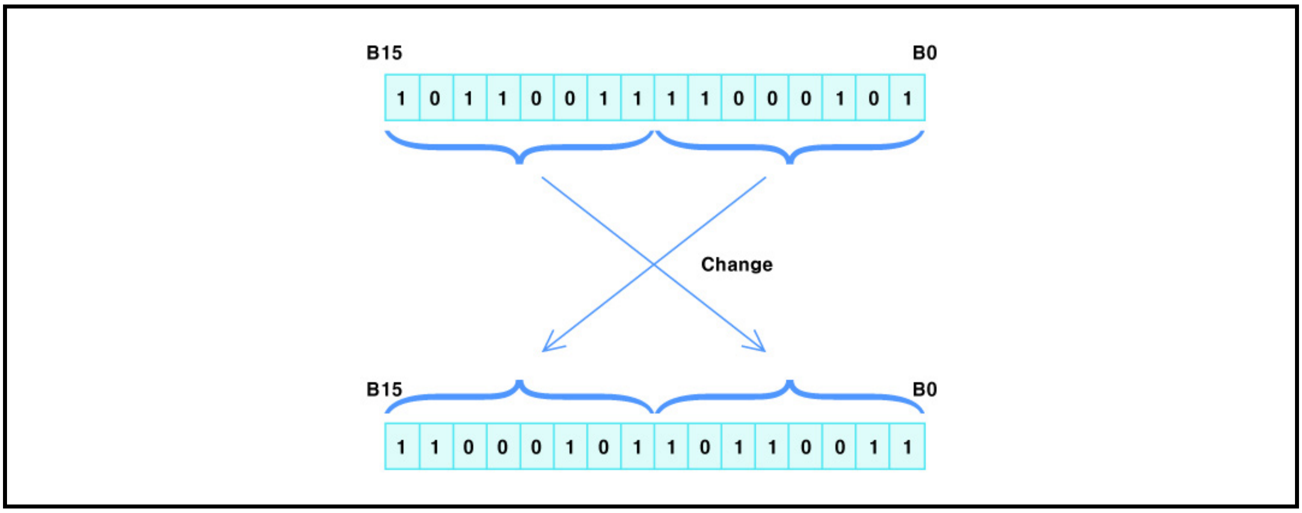
OP	DATA type	Available device / Description / Range
D	WORD	Y, F, Z, T, C, M, S, L, D, UW
		Data address to exchange upper and lower bit
		0(h0000) to 65535(hFFFF)

Error	Zero	Carry	Borrow	Step
				3

<Ladder>



Exchanges the high order bytes of the designated word with its low order bytes each other.



3.2.91 Exchange instruction(DSWAP)

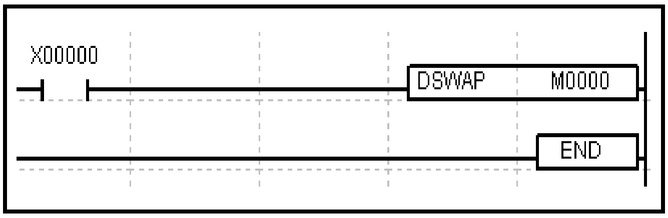
Exchange instruction **DSWAP** **D**

Applicable model

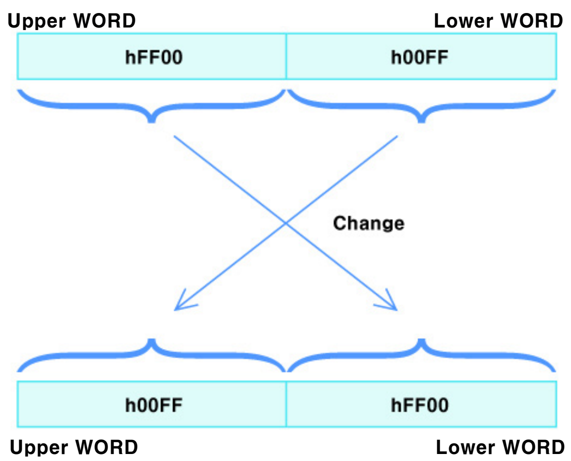
LP-S044, LP-S070

OP	DATA type	Available device / Description / Range	Error	Zero	Carry	Borrow	Step
D	DWORD	Y, F, Z, T, C, M, S, L, D, UW					
		Data address to exchange upper and lower bit					
		0(h0000) to 4294967295(hFFFFFFFF)					3

<Ladder>



Exchanges the high order word of the designated double word with its low order word.



3.2.92 Rotation instruction(ROR)

Rotation instruction	ROR	S	C

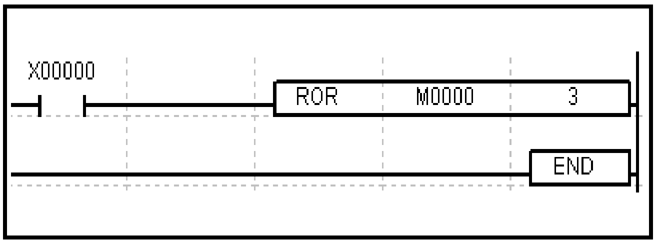
Applicable model

LP-S044, LP-S070

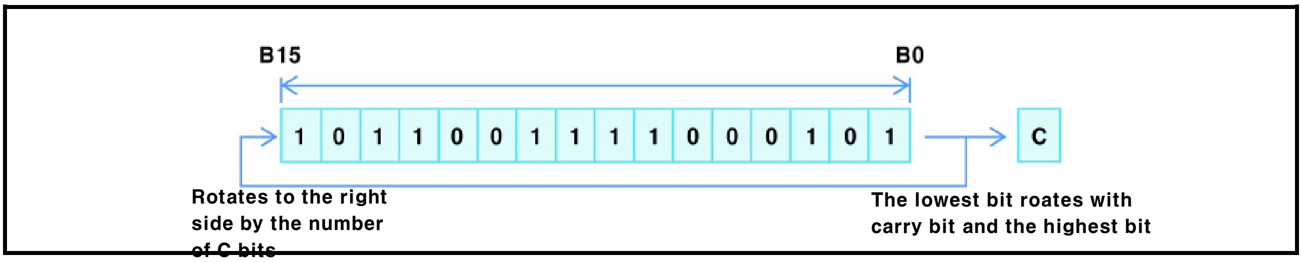
OP	DATA type	Available device / Description / Range
S	WORD	Y, F, Z, T, C, M, S, L, D, UW
		Data address to execute the operation
		0(h0000) to 65535(hFFFF)
C	WORD	X, Y, F, Z, T, C, M, S, L, D, UW, integer
		The number of bits to rotate right side
		0 to 255

Error	Zero	Carry	Borrow	Step
				5

<Ladder>



Rotates the source word to the right side by the number of C bits.



3.2.93 Rotation instruction(DROR)

Rotation instruction **DROR** **S** **C**

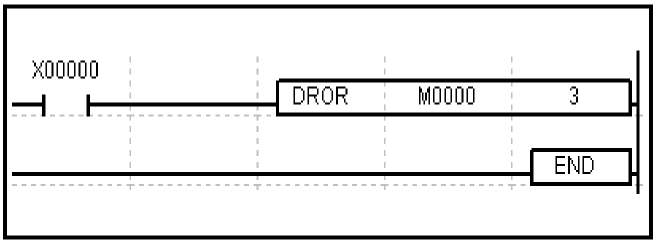
Applicable model

LP-S044, LP-S070

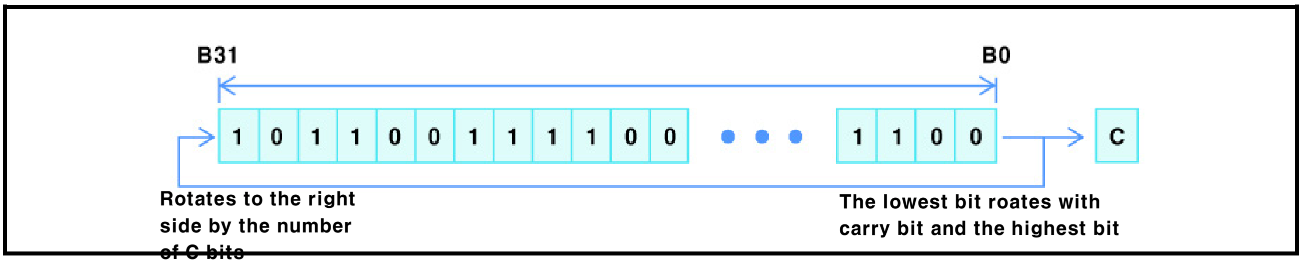
OP	DATA type	Available device / Description / Range
S	DWORD	X, F, Z, T, C, M, S, L, D, UW
		Data address to execute the operation
		0(h0000) to 4294967295(hFFFFFFFF)
C	WORD	X, Y, F, Z, T, C, M, S, L, D, UW, integer
		The number of bits to rotate right side
		0 to 255

Error	Zero	Carry	Borrow	Step
				5

<Ladder>



Rotates the source double word to the right side by the number of C bits.



3.2.94 Rotation instruction(AROR)

Rotation instruction **AROR** **S** **N** **C**

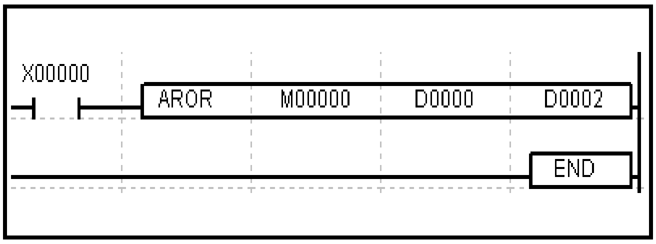
Applicable model

LP-S044, LP-S070

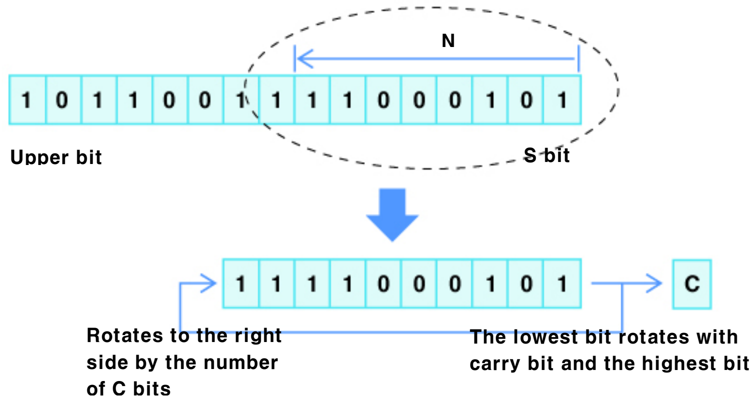
OP	DATA type	Available device / Description / Range
S	BIT	Y, F, T, C, M, UB
		Start address for bit device of the data to execute the operataion
		Not applicable
N	WORD	X, Y, F, Z, T, C, M, S, L, D, UW, integer
		The number of bit device to execute the operation from start address
		To the remained device range in corresponding S area
C	WORD	X, Y, F, Z, T, C, M, S, L, D, UW, integer
		The number of bits to rotate right side
		0 to 255

Error	Zero	Carry	Borrow	Step
		◎		7

<Ladder>



Within the number of N bits, bits rotate to the right side by the number of C bits beginning with S bit.



3.2.95 Rotation instruction(RORC)

Rotation instruction **RORC** **S** **C**

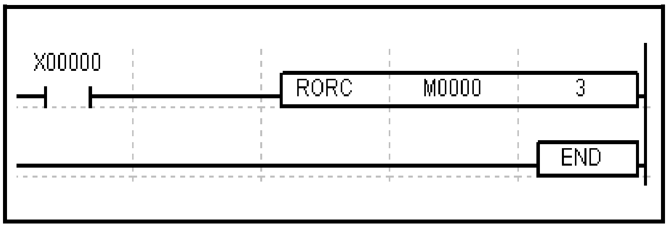
Applicable model

LP-S044, LP-S070

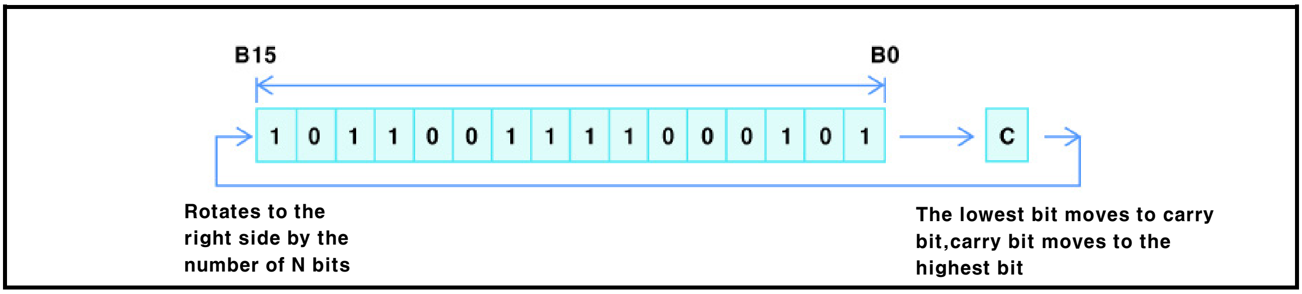
OP	DATA type	Available device / Description / Range
S	WORD	Y, F, Z, T, C, M, S, L, D, UW
		Data address to execute the operation
		0(h0000) to 65535(hFFFF)
C	WORD	X, Y, F, Z, T, C, M, S, L, D, UW, integer
		The number of bits to rotate right side
		0 to 255

Error	Zero	Carry	Borrow	Step
		◎		5

<Ladder>



Rotates the source word including carry bit, to the right side by the number of C bits.



3.2.96 Rotation instruction(DRORC)

Rotation instruction **DRORC** **S** **C**

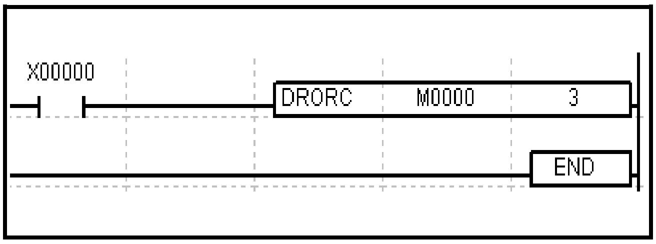
Applicable model

LP-S044, LP-S070

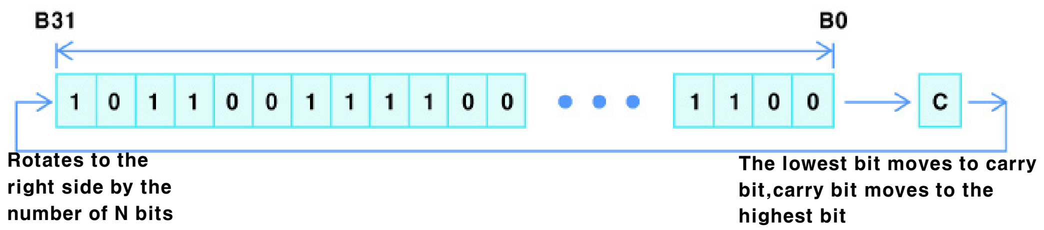
OP	DATA type	Available device / Description / Range
S	DWORD	Y, F, Z, T, C, M, S, L, D, UW
		Data address to execute the operation
		0(h0000) to 4294967295(hFFFFFFFF)
C	WORD	X, Y, F, Z, T, C, M, S, L, D, UW, integer
		The number of bits to rotate right side
		0 to 255

Error	Zero	Carry	Borrow	Step
		◎		5

<Ladder>



Rotates the source double word including carry bit, to the right side by the number of C bits.



3.2.97 Rotation instruction(ARORC)

Rotation instruction	ARORC	S	N	C

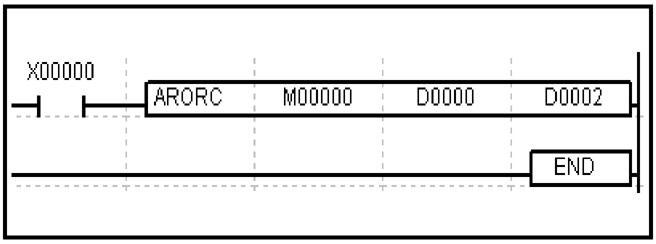
Applicable model

LP-S044, LP-S070

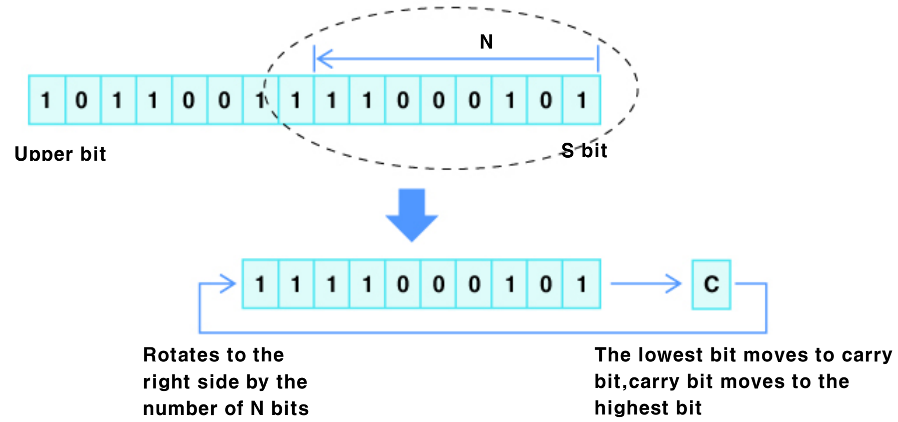
OP	DATA type	Available device / Description / Range
S	BIT	Y, F, T, C, M, UB
		Start address for bit device of the data to execute the operataion
		Not applicable
N	WORD	X, Y, F, Z, T, C, M, S, L, D, UW, integer
		The number of bit device to execute the operation from start address
		To the remained device range in corresponding S area
C	WORD	X, Y, F, Z, T, C, M, S, L, D, UW, integer
		The number of bits to rotate right side
		0 to 255

Error	Zero	Carry	Borrow	Step
		◎		7

<Ladder>



Within the number of N bits, rotates the designated bits including carry bit to the right side by the number of C bits.



3.2.98 Rotation instruction(ROL)

Rotation instruction **ROL** **S** **C**

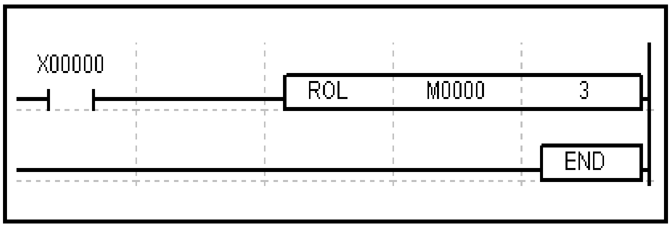
Applicable model

LP-S044, LP-S070

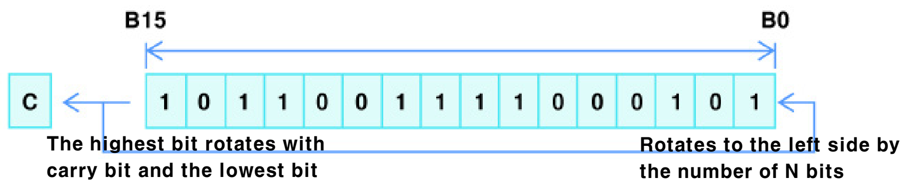
OP	DATA type	Available device / Description / Range
S	WORD	Y, F, Z, T, C, M, S, L, D, UW
		Data address to execute the operation
		0(h0000) to 65535(hFFFF)
C	WORD	X, Y, F, Z, T, C, M, S, L, D, UW, integer
		The number of bits to rotate left side
		0 to 255

Error	Zero	Carry	Borrow	Step
				5

<Ladder>



Rotates the source word to the left side by the number of C bits.



3.2.99 Rotation instruction(DROL)

Rotation instruction	DROL	S	C

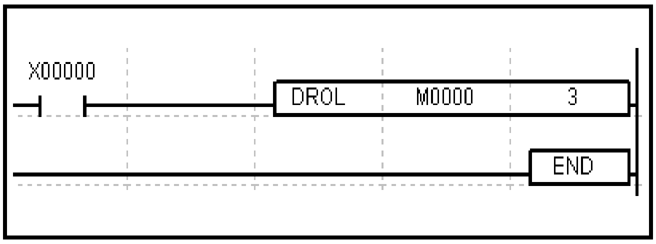
Applicable model

LP-S044, LP-S070

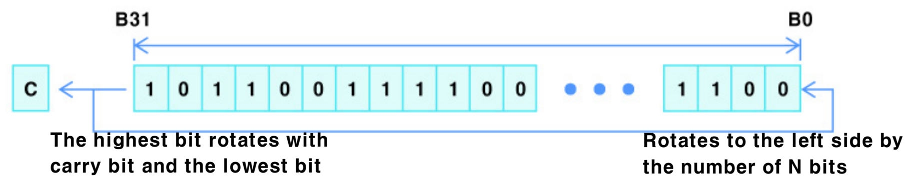
OP	DATA type	Available device / Description / Range
S	DWORD	Y, F, Z, T, C, M, S, L, D, UW
		Data address to execute the operation
		0(h0000) to 4294967295(hFFFFFFFF)
C	WORD	X, Y, F, Z, T, C, M, S, L, D, UW, integer
		The number of bits to rotate left side
		0 to 255

Error	Zero	Carry	Borrow	Step
				5

<Ladder>



Rotates the source double word to the left side by the number of C bits.



3.2.100 Rotation instruction(AROL)

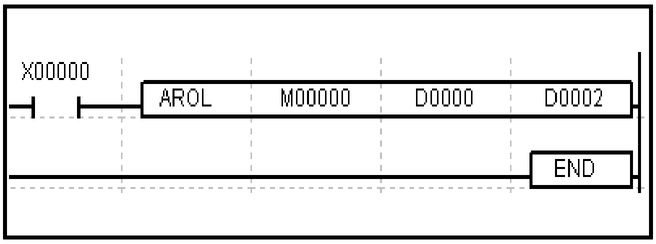
Rotation instruction **AROL** **S** **N** **C**

Applicable model
LP-S044, LP-S070

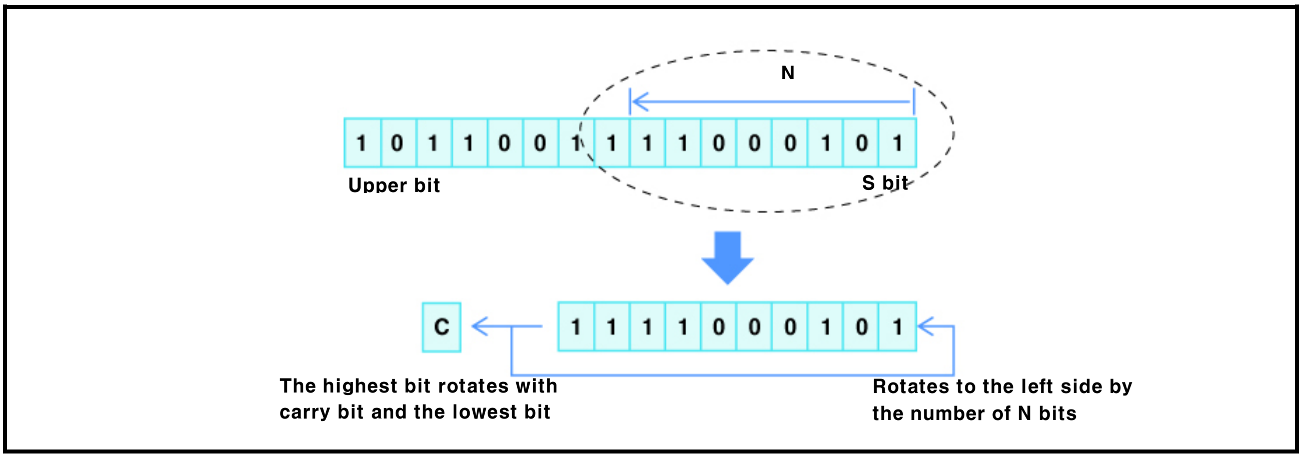
OP	DATA type	Available device / Description / Range
S	BIT	Y, F, T, C, M, UB
		Start address for bit device of the data to execute the operataion
		Not applicable
N	WORD	X, Y, F, Z, T, C, M, S, L, D, UW, integer
		The number of bit device to execute the operation from start address
		To the remained device range in corresponding S area
C	WORD	X, Y, F, Z, T, C, M, S, L, D, UW, integer
		The number of bits to rotate left side
		0 to 255

Error	Zero	Carry	Borrow	Step
		◎		7

<Ladder>



Within the number of N bits, rotates the designated bits beginning with the S bit to the left side by the number of C bits.



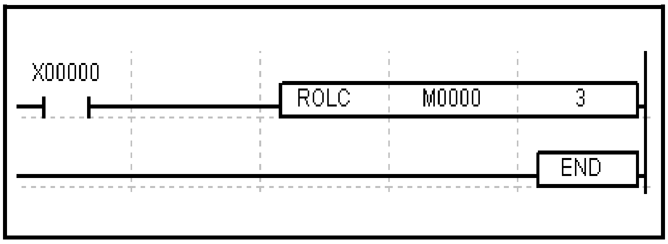
3.2.101 Rotation instruction(ROLC)

Rotation instruction	ROLC	S	C	Applicable model LP-S044, LP-S070

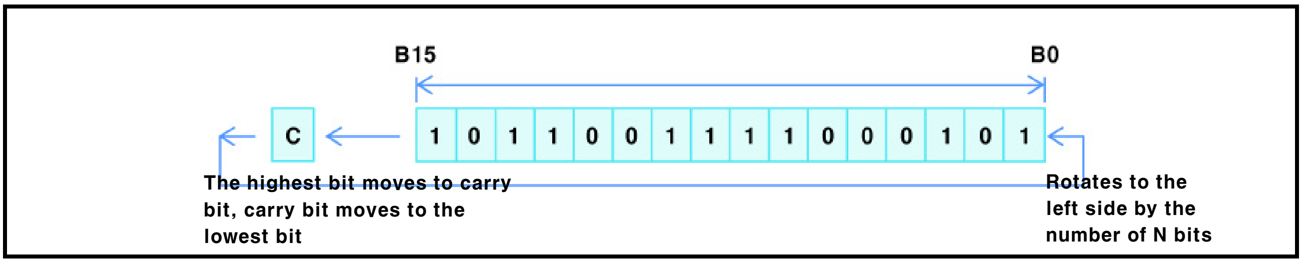
OP	DATA type	Available device / Description / Range
S	WORD	Y, F, Z, T, C, M, S, L, D, UW
		Data address to execute the operation
		0(h0000) to 65535(hFFFF)
C	WORD	X, Y, F, Z, T, C, M, S, L, D, UW, integer
		The number of bits to rotate right side
		0 to 255

Error	Zero	Carry	Borrow	Step
		◎		5

<Ladder>



Rotates the source word including carry bit to the left side by the number of C bits.



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3.2.102 Rotation instruction(DROLC)

Rotation instruction	DROLC	S	C

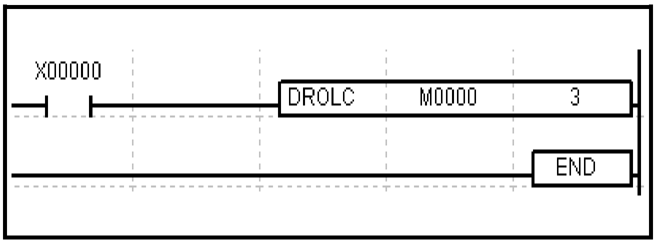
Applicable model

LP-S044, LP-S070

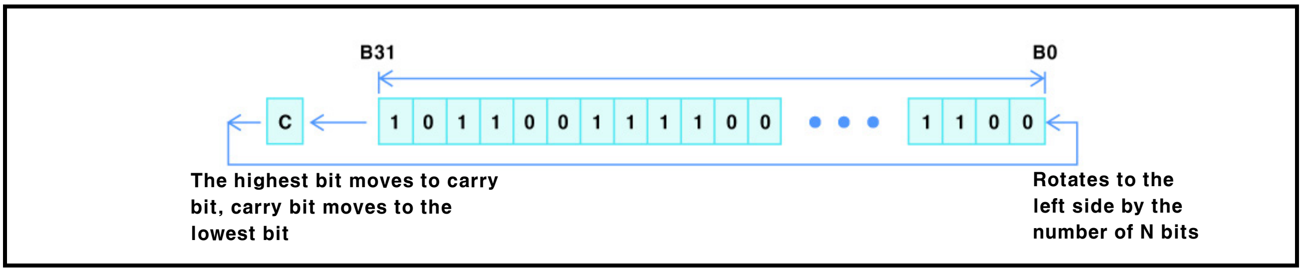
OP	DATA type	Available device / Description / Range
S	DWORD	Y, F, Z, T, C, M, S, L, D, UW
		Data address to execute the operation
		0(h0000) to 4294967295(hFFFFFFFF)
C	WORD	X, Y, F, Z, T, C, M, S, L, D, UW, integer
		The number of bits to rotate left side
		0 to 255

Error	Zero	Carry	Borrow	Step
		◎		5

<Ladder>



Rotates the source double word including the cary bit to the left side by the number of C bits.



3.2.103 Rotation instruction(AROLC)

Rotation instruction **AROLC** **S** **N** **C**

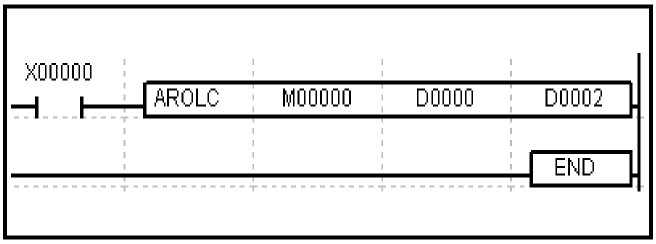
Applicable model

LP-S044, LP-S070

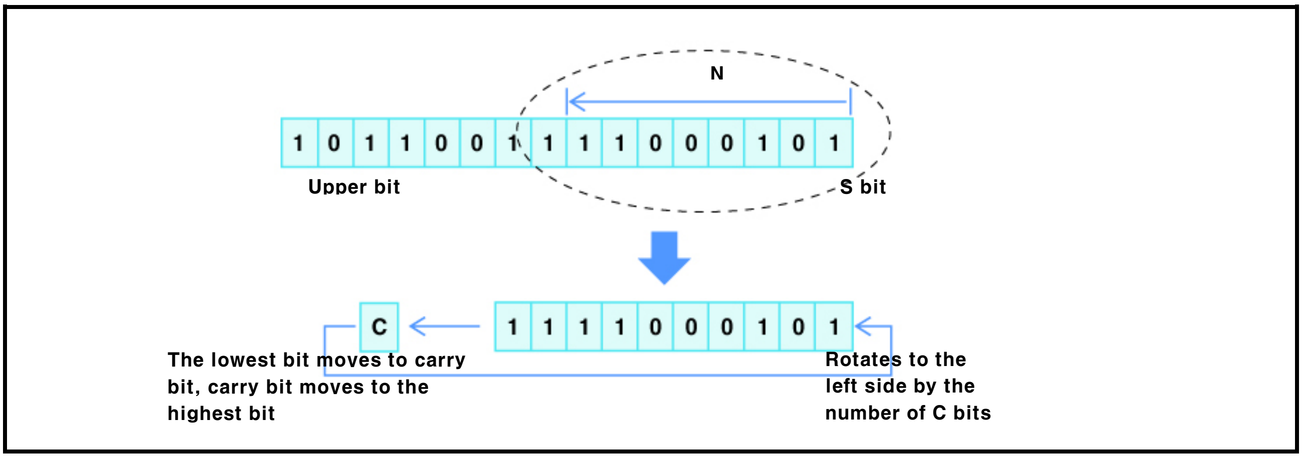
OP	DATA type	Available device / Description / Range
S	BIT	Y, F, T, C, M, UB
		Start address for bit device of the data to execute the operataion
		Not applicable
N	WORD	X, Y, F, Z, T, C, M, S, L, D, UW, integer
		The number of bit device to execute the operation from start address
		To the remained device range in corresponding S area
C	WORD	X, Y, F, Z, T, C, M, S, L, D, UW, integer
		The number of bits to rotate left side
		0 to 255

Error	Zero	Carry	Borrow	Step
		◎		7

<Ladder>



Within the range from the source bit to the N bit, rotates the designated bits including the carry bit to the left side by the number of C bits beginning with the S bit.



3.2.104 Movement instruction(SFTR)

Movement instruction	SFTR	S	N

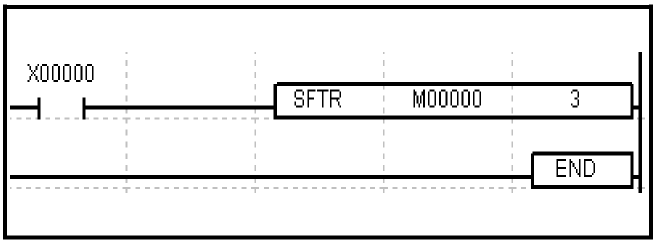
Applicable model

LP-S044, LP-S070

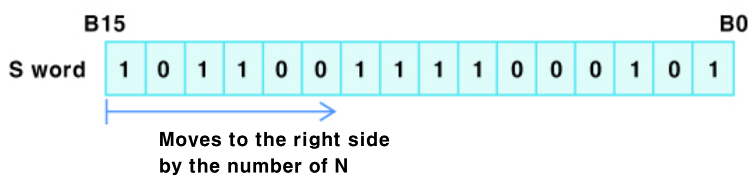
OP	DATA type	Available device / Description / Range
S	WORD	Y, F, Z, T, C, M, S, L, D, UW
		Data address to execute the operation
		0(h0000) to 65535(hFFFF)
N	WORD	X, Y, F, Z, T, C, M, S, L, D, UW, integer
		The number of bits to rotate right side
		0 to 16

Error	Zero	Carry	Borrow	Step
		◎		9

<Ladder>



1. Within the S word, moves the 16-bit of S word to the right side by the number of N bits.
2. If the N_{th} bit from the low order bit is 1, carry bit is SET.



3.2.105 Movement instruction(ASFTR)

Movement instruction **ASFTR** **S** **N1** **N2**

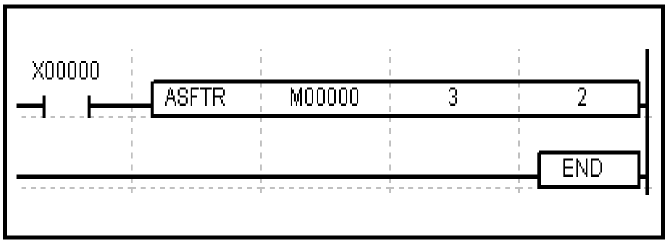
Applicable model

LP-S044, LP-S070

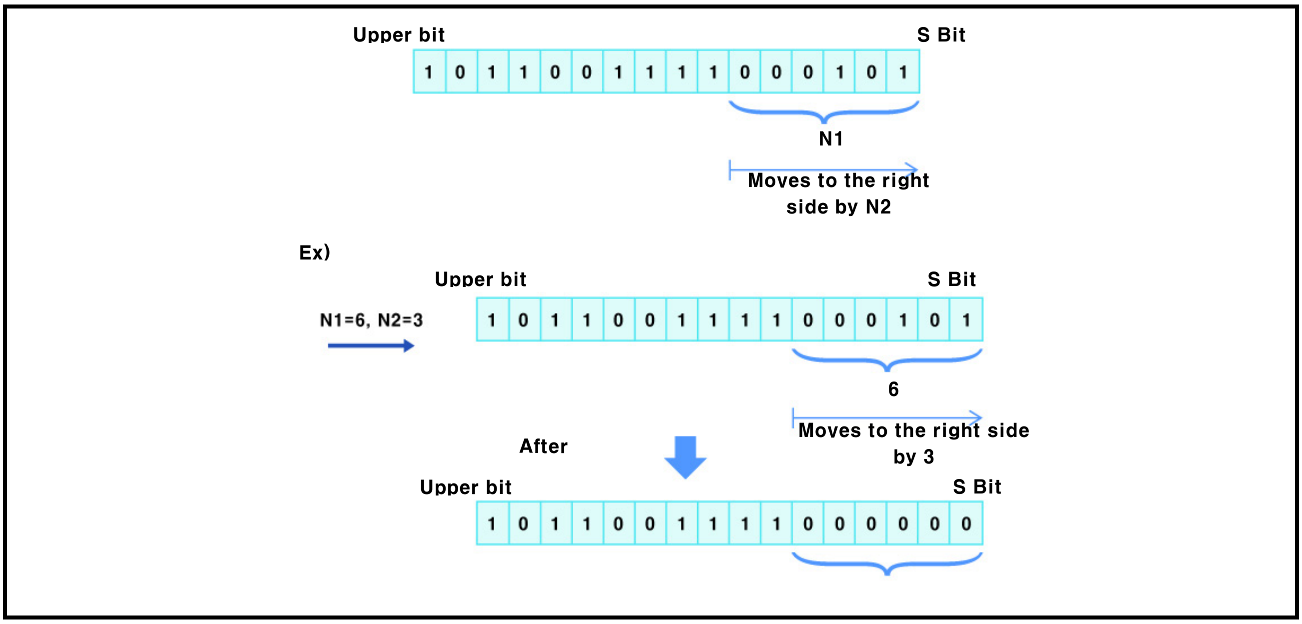
OP	DATA type	Available device / Description / Range
S	BIT	Y, F, T, C, M, UB
		Start bit position of the data to execute the operation
		Not applicable
N1	WORD	X, Y, F, Z, T, C, M, S, L, D, UW, integer
		The number of bits from the designated position as S
		0 to 32
N2	WORD	X, Y, F, Z, T, C, M, S, L, D, UW, integer
		The number of bits to rotate right side
		0 to 32

Error	Zero	Carry	Borrow	Step
				9

<Ladder>



1. From the source bit, N1 bits moves to the right side as N2 in the range.
2. The high order bits, which are the number of movement, have “0” as their value.
3. If the value of N2 is greater than N1, the values from source bit to N bit are shifted to “0”.



3.2.106 Movement instruction(SFTL)

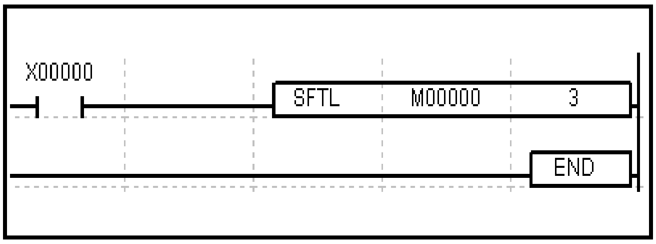
Movement instruction **SFTL** **S** **N**

Applicable model
LP-S044, LP-S070

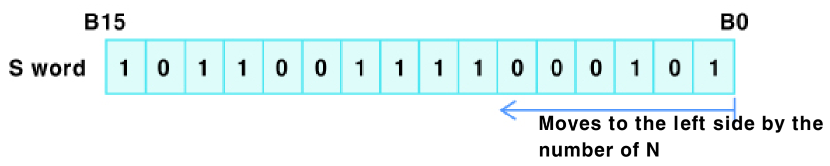
OP	DATA type	Available device / Description / Range
S	WORD	Y, F, Z, T, C, M, S, L, D, UW
		Data address to execute the operation
		0(h0000) to 65535(hFFFF)
N	WORD	X, Y, F, Z, T, C, M, S, L, D, UW, integer
		The number of bits to rotate left side
		0 to 16

Error	Zero	Carry	Borrow	Step
		◎		9

<Ladder>



1. Within the source word, move the 16 bits of source word to the left by the number of N bits.
2. If the N_{th} bit from the high order bit is 1, carry bit is SET.



3.2.107 Movement instruction(ASFTL)

Movement instruction **ASFTL** **S** **N1** **N2**

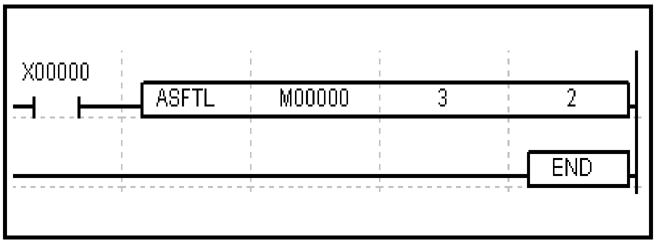
Applicable model

LP-S044, LP-S070

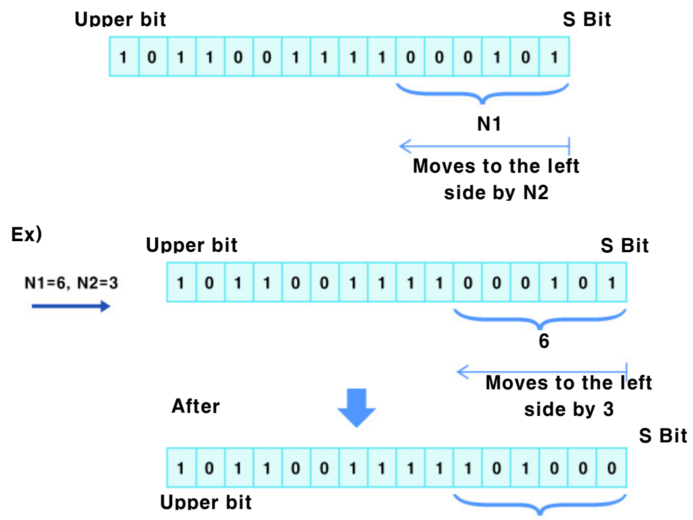
OP	DATA type	Available device / Description / Range
S	BIT	Y, F, T, C, M, UB
		Start bit position of the data to execute the operation
		Not applicable
N1	WORD	X, Y, F, Z, T, C, M, S, L, D, UW, integer
		The number of bits from the designated position as S
		0 to 32
N2	WORD	X, Y, F, Z, T, C, M, S, L, D, UW, integer
		The number of bits to rotate left side
		0 to 32

Error	Zero	Carry	Borrow	Step
				9

<Ladder>



1. From the source bit, N1 bits moves to the left sied as N2 in the range.
2. The low order bits, which are the number of movement, have “0” as their value.
3. If the value of N2 is greater than N1, the values of designated bits, from source bit to the N1, are shifted to “0”.



3.2.108 Movement instruction(WSFTR)

Movement instruction **WSFTR** **S** **N1** **N2**

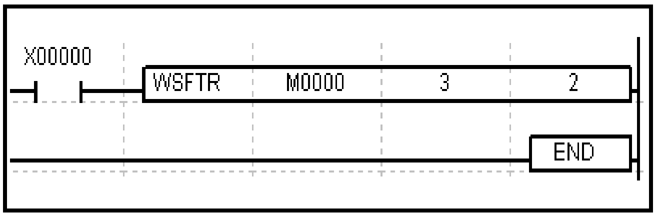
Applicable model

LP-S044, LP-S070

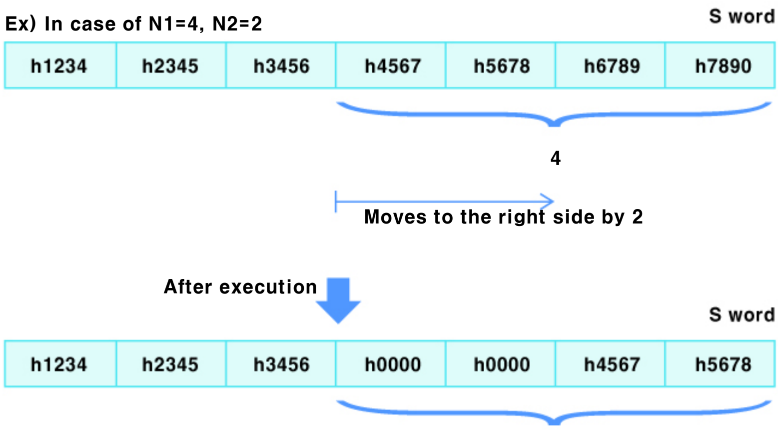
OP	DATA type	Available device / Description / Range
S	WORD	Y, F, Z, T, C, M, S, L, D, UW
		Data address to execute the operation
		0(h0000) to 65535(hFFFF)
N1	WORD	X, Y, F, Z, T, C, M, S, L, D, UW, integer
		The number of words from the designated position as S
		To the remained device range in corresponding S area
N2	WORD	X, Y, F, Z, T, C, M, S, L, D, UW, integer
		The number of words to move to the right
		To the range not greater than the N1 value

Error	Zero	Carry	Borrow	Step
				9

<Ladder>



1. From the source word, N1 words moves to the right side as N2 in the range by word unit.
2. The high order words, which are the number of movement, have "0" as their value.



3.2.109 Movement instruction(WSFTL)

Movement instruction **WSFTL** **S** **N1** **N2**

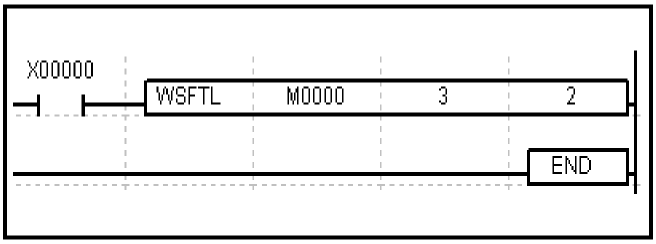
Applicable model

LP-S044, LP-S070

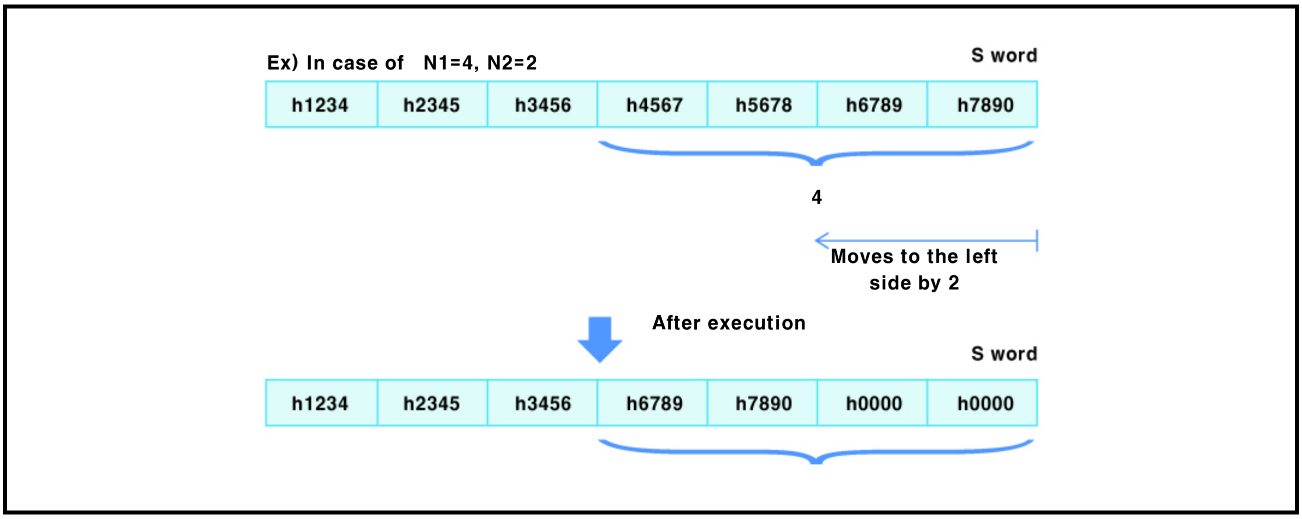
OP	DATA type	Available device / Description / Range
S	WORD	Y, F, Z, T, C, M, S, L, D, UW
		Data address to execute the operation
		0(h0000) to 65535(hFFFF)
N1	WORD	X, Y, F, Z, T, C, M, S, L, D, UW, integer
		The number of words from the designated position as S
		To the remained device range in corresponding S area
N2	WORD	X, Y, F, Z, T, C, M, S, L, D, UW, integer
		The number of words to move to the left
		To the range not greater than the N1 value

Error	Zero	Carry	Borrow	Step
				9

<Ladder>



1. From the source word, N1 words moves to the left side as N2 in the range by word unit.
2. The lower order words, which are the number of movement, have “0” as their value.



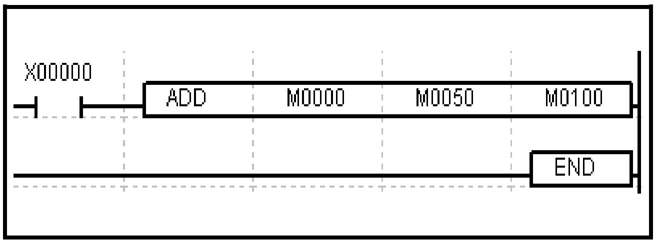
3.2.110 Arithmetic operation instruction(ADD)

Arithmetic operation instruction	ADD	S1	S2	D	Applicable model
					LP-S044, LP-S070

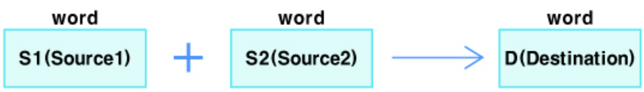
OP	DATA type	Available device / Description / Range
S1	INT	X, Y, F, Z, T, C, M, S, L, D, UW, integer
		Data address to execute the addition operation with S2
		-32768(h8000) to 32767(h7FFF)
S2	INT	X, Y, F, Z, T, C, M, S, L, D, UW, integer
		Data address to execute the addition operation with S1
		-32768(h8000) to 32767(h7FFF)
D	INT	Y, F, Z, T, C, M, S, L, D, UW
		Address to save the operation result
		-32768(h8000) to 32767(h7FFF)

Error	Zero	Carry	Borrow	Step
	◎	◎		7

<Ladder>



1. Adds the word values of S1 and S2, and then stores the result into the destination word D
2. Executes the Signed operation.
(h8000(-32768) to hFFFF(-1) < 0 to h7FFF(32767))
3. If the result value exceeds 'h7FFF(32767)', carry flag is SET.
4. If the result value is h0000, zero flag is SET.



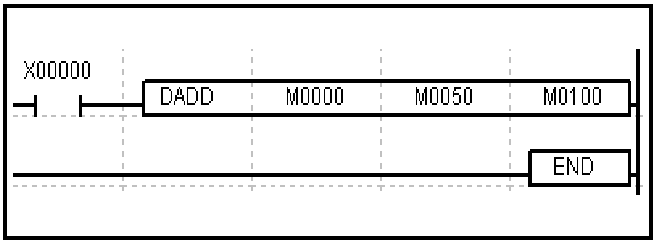
3.2.111 Arithmetic operation instruction(DADD)

Arithmetic operation instruction	DADD	S1	S2	D	Applicable model
					LP-S044, LP-S070

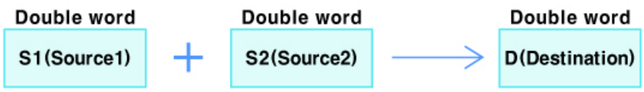
OP	DATA type	Available device / Description / Range
S1	DINT	X, Y, F, Z, T, C, M, S, L, D, UW, integer
		Data address to execute the addition operation with S2
		-2147483648(h80000000) to 2147483647(h7FFFFFFF)
S2	DINT	X, Y, F, Z, T, C, M, S, L, D, UW, integer
		Data address to execute the addition operation with S1
		-2147483648(h80000000) to 2147483647(h7FFFFFFF)
D	DINT	Y, F, Z, T, C, M, S, L, D, UW
		Address to save the operation result
		-2147483648(h80000000) to 2147483647(h7FFFFFFF)

Error	Zero	Carry	Borrow	Step
	◎	◎		7

<Ladder>



1. Adds the double word values of S1 and S2, and then stores the result into the destination double word D.
2. Executes the Signed operation.
(h80000000(-2147483648) to hFFFFFFFF(-1) < 0 to h7FFFFFFF(2147483647))
3. If the result value exceeds ‘h7FFFFFFF (2147483647)’, carry flag is SET.
4. If the result value is ‘h00000000’, zero flag is SET.



3.2.112 Arithmetic operation instruction(ADDU)

Arithmetic operation instruction **ADDU** **S1** **S2** **D**

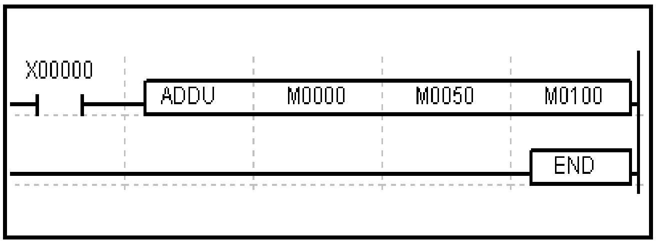
Applicable model

LP-S044, LP-S070

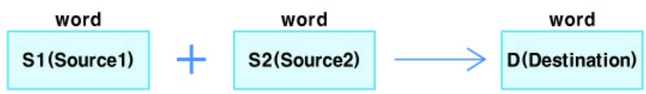
OP	DATA type	Available device / Description / Range
S1	WORD	X, Y, F, Z, T, C, M, S, L, D, UW, integer
		Data address to execute the addition operation with S2
		0(h0000) to 65535(hFFFF)
S2	WORD	X, Y, F, Z, T, C, M, S, L, D, UW, integer
		Data address to execute the addition operation with S1
		0(h0000) to 65535(hFFFF)
D	WORD	Y, F, Z, T, C, M, S, L, D, UW
		Address to save the operation result
		0(h0000) to 65535(hFFFF)

Error	Zero	Carry	Borrow	Step
	◎	◎		7

<Ladder>



1. Adds the word values of S1 and S2 and then stores the result into the destination word D.
2. Executes the Unsigned operation.
3. If the result value exceeds ‘hFFFF(65535)’, carry flag is SET.
4. If the result value is ‘h0000’, zero flag is SET.



3.2.113 Arithmetic operation instruction(DADDU)

Arithmetic operation instruction **DADDU** **S1** **S2** **D**

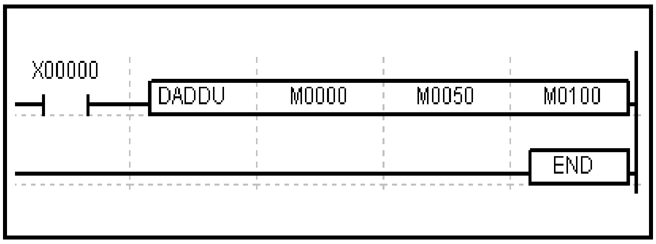
Applicable model

LP-S044, LP-S070

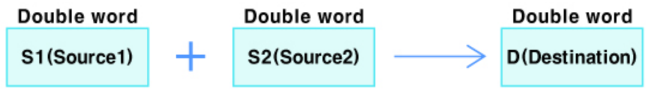
OP	DATA type	Available device / Description / Range
S1	DWORD	X, Y, F, Z, T, C, M, S, L, D, UW, integer
		Data address to execute the addition operation with S2
		0(h0000) to 4294967295(hFFFFFFFF)
S2	DWORD	X, Y, F, Z, T, C, M, S, L, D, UW, integer
		Data address to execute the addition operation with S1
		0(h0000) to 4294967295(hFFFFFFFF)
D	DWORD	Y, F, Z, T, C, M, S, L, D, UW
		Address to save the operation result
		0(h0000) to 4294967295(hFFFFFFFF)

Error	Zero	Carry	Borrow	Step
	◎	◎		7

<Ladder>



1. Adds the double word values of S1 and S2, and then stores the result into the destination double word D.
2. Executes the Unsigned operation.
3. If the result value exceeds ‘hFFFFFFFF (4294967295)’, carry flag is SET.
4. If the result value is ‘h0000’, zero flag is SET.



3.2.114 Arithmetic operation instruction(ADDL)

Arithmetic operation instruction	ADDL	S1	S2	D	N

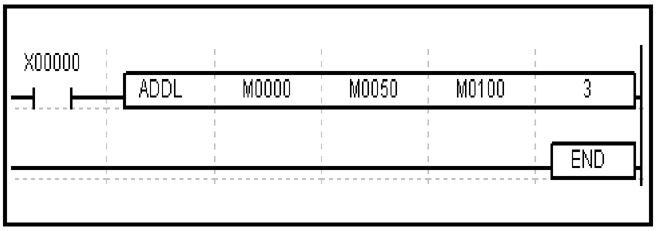
Applicable model

LP-S044, LP-S070

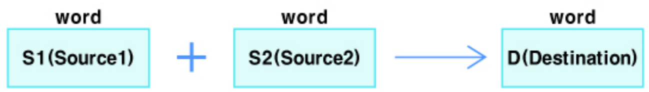
OP	DATA type	Available device / Description / Range
S1	INT	X, Y, F, Z, T, C, M, S, L, D, UW, integer
		Data address to execute the addition operation with S2
		-32768(h8000) to 32767(h7FFF)
S2	INT	X, Y, F, Z, T, C, M, S, L, D, UW
		Data address to execute the addition operation with S1
		-32768(h8000) to 32767(h7FFF)
D	INT	Y, F, Z, T, C, M, S, L, D, UW
		Address to save the operation result
		-32768(h8000) to 32767(h7FFF)
N	WORD	X, Y, F, Z, T, C, M, S, L, D, UW, integer
		The number of S2 data address and saved address to execute the operation with S1
		In the range within the corresponding device area of S2 and D

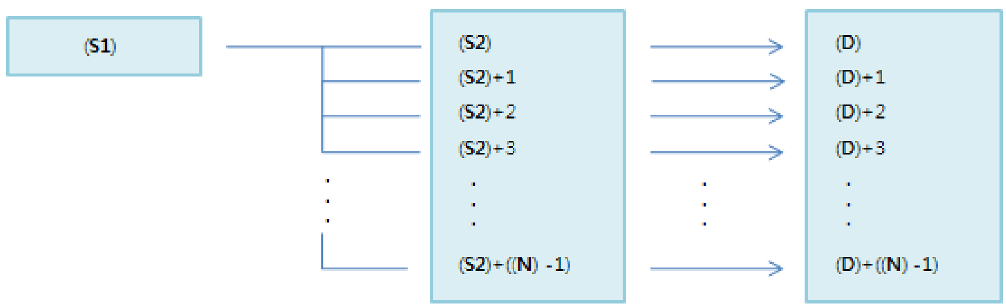
Error	Zero	Carry	Borrow	Step
	◎	◎		9

<Ladder>



1. Adds the word value of S1 and the number of N word values beginning with S2 one by one, and then stores the number of N results into the number of N corresponding destination words beginning with word D.
2. Executes the Signed operation.
(h8000(-32768) to hFFFF(-1) < 0 to h7FFF(32767))
3. If the result value is ‘h0000’, zero flag is SET.





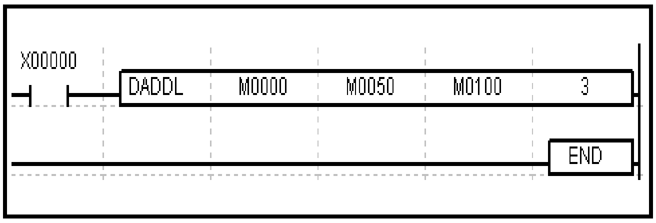
3.2.115 Arithmetic operation instruction(DADDL)

Arithmetic operation instruction	DADDL	S1	S2	D	N	Applicable model
						LP-S044, LP-S070

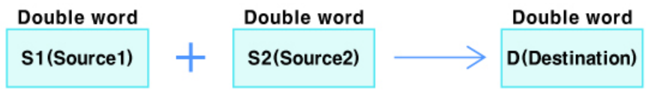
OP	DATA type	Available device / Description / Range
S1	DINT	X, Y, F, Z, T, C, M, S, L, D, UW, integer
		Data address to execute the addition operation with S2
		-2147483648(h80000000) to 2147483647(h7FFFFFFF)
S2	DINT	X, Y, F, Z, T, C, M, S, L, D, UW
		Data address to execute the addition operation with S1
		-2147483648(h80000000) to 2147483647(h7FFFFFFF)
D	DINT	Y, F, Z, T, C, M, S, L, D, UW
		Address to save the operation result
		-2147483648(h80000000) to 2147483647(h7FFFFFFF)
N	WORD	X, Y, F, Z, T, C, M, S, L, D, UW, integer
		The number of S2 data address and saved address to execute the operation with S1
		In the range within the corresponding device area of S2 and D

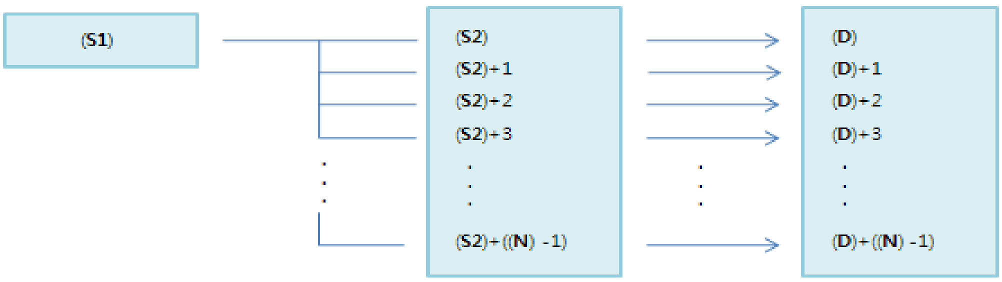
Error	Zero	Carry	Borrow	Step
	◎	◎		9

<Ladder>



1. Adds the double word value of S1 and the number of N double word values beginning with S2 one by one, and then stores their results into the number of N corresponding destination double words beginning with double word D respectively.
2. Executes the Signed operation.
(h80000000(-2147483648) to hFFFFFFFF(-1) < 0 to h7FFFFFFF(2147483647))
3. If the result value is 'h00000000', zero flag is SET.





3.2.116 Arithmetic operation instruction(ADDLU)

Arithmetic operation instruction **ADDLU S1 S2 D N**

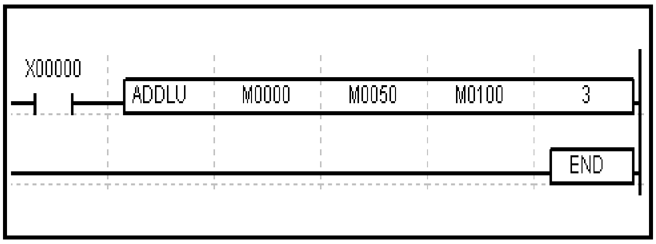
Applicable model

LP-S044, LP-S070

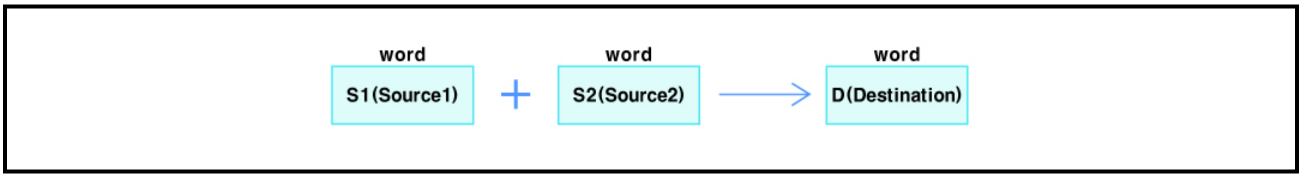
OP	DATA type	Available device / Description / Range
S1	WORD	X, Y, F, Z, T, C, M, S, L, D, UW, integer
		Data address to execute the addition operation with S2
		0(h0000) to 65535(hFFFF)
S2	WORD	X, Y, F, Z, T, C, M, S, L, D, UW
		Data address to execute the addition operation with S1
		0(h0000) to 65535(hFFFF)
D	WORD	Y, F, Z, T, C, M, S, L, D, UW
		Address to save the operation result
		0(h0000) to 65535(hFFFF)
N	WORD	X, Y, F, Z, T, C, M, S, L, D, UW, integer
		The number of S2 data address and saved address to execute the operation with S1
		In the range within the corresponding device area of S2 and D

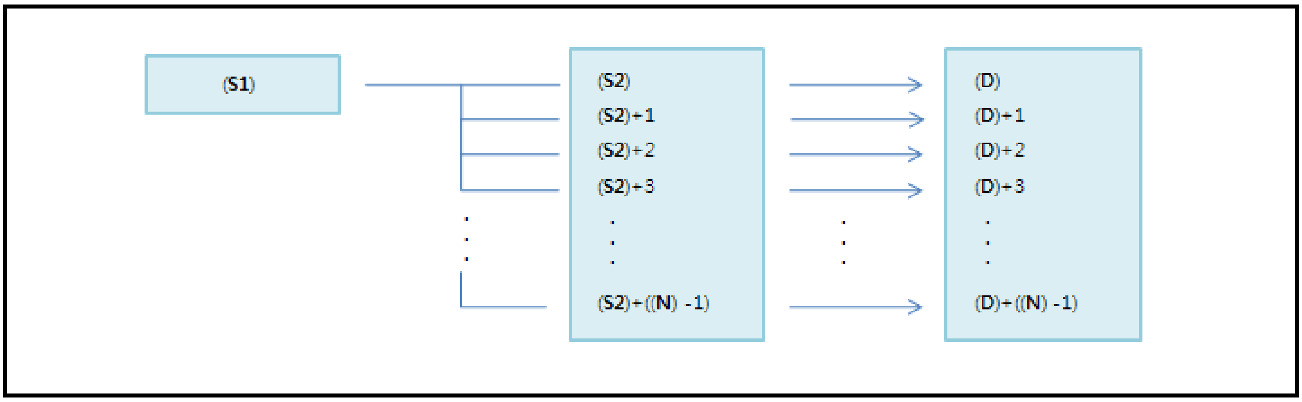
Error	Zero	Carry	Borrow	Step
	◎	◎		9

<Ladder>



1. Adds the word value of S1 and the number of N word values beginning with S2 one by one, and then stores their results into the number of N corresponding destination words beginning with word D respectively.
2. Executes the Unsigned operation.
3. If the result value exceeds 'hFFFF(65535)' carry flag is SET.
4. If the result value is 'h0000', zero flag is SET.





3.2.117 Arithmetic operation instruction(DADDLU)

Arithmetic operation instruction	DADDLU	S1	S2	D	N

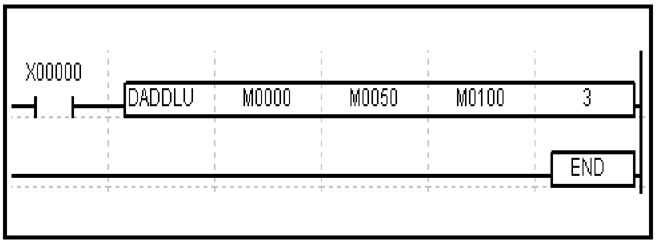
Applicable model

LP-S044, LP-S070

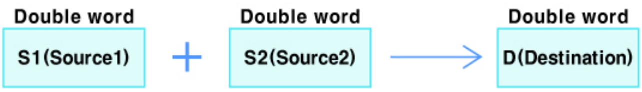
OP	DATA type	Available device / Description / Range
S1	DWORD	X, Y, F, Z, T, C, M, S, L, D, UW, integer
		Data address to execute the addition operation with S2
		0(h0000) to 4294967295(hFFFFFFFF)
S2	DWORD	X, Y, F, Z, T, C, M, S, L, D, UW
		Data address to execute the addition operation with S1
		0(h0000) to 4294967295(hFFFFFFFF)
D	DWORD	Y, F, Z, T, C, M, S, L, D, UW
		Address to save the operation result
		0(h0000) to 4294967295(hFFFFFFFF)
N	WORD	X, Y, F, Z, T, C, M, S, L, D, UW, integer
		The number of S2 data address and saved address to execute the operation with S1
		In the range within the corresponding device area of S2 and D

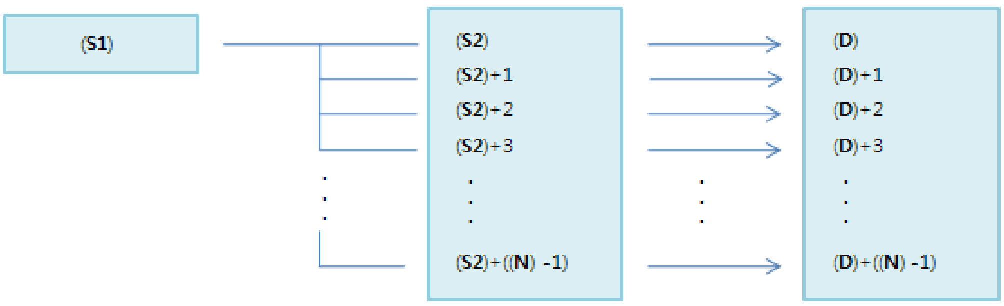
Error	Zero	Carry	Borrow	Step
	◎	◎		9

<Ladder>



1. Adds the double word value of S1 and the number of N double word values beginning with S2 one by one, and then stores their results into the number of N corresponding destination double words beginning with double word D respectively.
2. Executes the Unsigned operation.
3. If the result value exceeds ‘hFFFFFFFF (4294967295)’, carry flag is SET.
4. If the result value is ‘h0000’, zero flag is SET.





3.2.118 Arithmetic operation instruction(SUB)

Arithmetic operation instruction	SUB	S1	S2	D

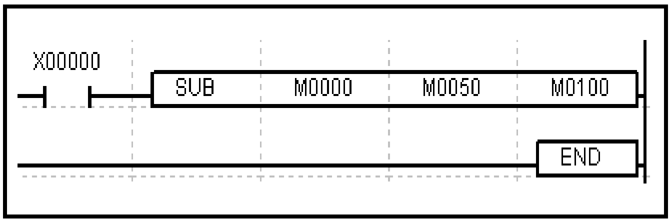
Applicable model

LP-S044, LP-S070

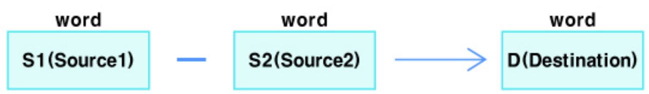
OP	DATA type	Available device / Description / Range
S1	INT	X, Y, F, Z, T, C, M, S, L, D, UW, integer
		Data address to execute the subtraction operation with S2
		-32768(h8000) to 32767(h7FFF)
S2	INT	X, Y, F, Z, T, C, M, S, L, D, UW, integer
		Data address to execute the subtraction operation with S1
		-32768(h8000) to 32767(h7FFF)
D	INT	Y, F, Z, T, C, M, S, L, D, UW
		Address to save the operation result
		-32768(h8000) to 32767(h7FFF)

Error	Zero	Carry	Borrow	Step
	◎		◎	7

<Ladder>



1. Subtracts the word value of S2 from the word value of S1 and then stores the result into the destination word D.
2. Executes the Signed operation.
(h8000(-32768) to hFFFF(-1) < 0 to h7FFF(32767))
3. If the result value is ‘h0000’, zero flag occurs.



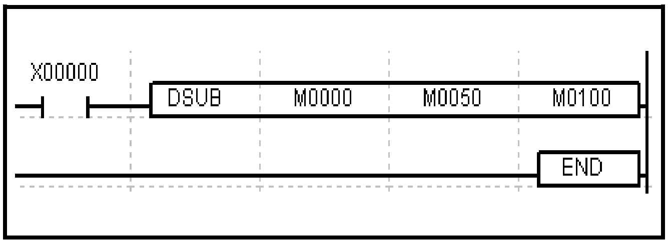
3.2.119 Arithmetic operation instruction(DSUB)

Arithmetic operation instruction	DSUB	S1	S2	D	Applicable model
					LP-S044, LP-S070

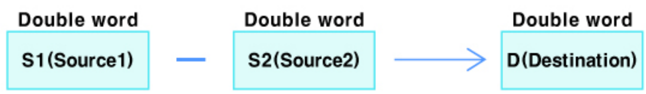
OP	DATA type	Available device / Description / Range
S1	DINT	X, Y, F, Z, T, C, M, S, L, D, UW, integer
		Data address to execute the subtraction operation with S2
		-2147483648(h80000000) to 2147483647(hFFFFFFFF)
S2	DINT	X, Y, F, Z, T, C, M, S, L, D, UW, integer
		Data address to execute the subtraction operation with S1
		-2147483648(h80000000) to 2147483647(hFFFFFFFF)
D	DINT	Y, F, Z, T, C, M, S, L ,D, UW
		Address to save the operation result
		-2147483648(h80000000) to 2147483647(hFFFFFFFF)

Error	Zero	Carry	Borrow	Step
	◎		◎	7

<Ladder>



1. Subtracts double word value of S2 from the double word value of S1 and then stores the result into the destination double word D.
2. Executes the Signed operation.
(h80000000(-2147483648) to hFFFFFFFF(-1) <
0 to h7FFFFFFF(2147483647))
3. If the result value is 'h00000000', zero flag occurs.



3.2.120 Arithmetic operation instruction(SUBU)

Arithmetic operation instruction	SUBU	S1	S2	D

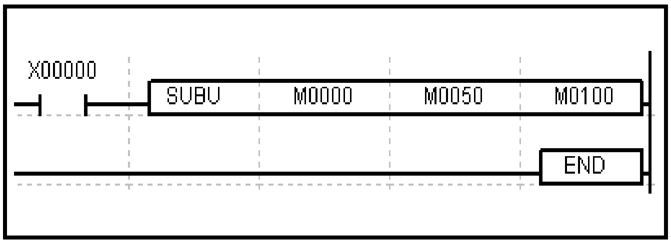
Applicable model

LP-S044, LP-S070

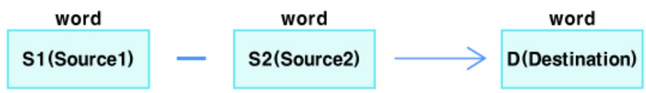
OP	DATA type	Available device / Description / Range
S1	WORD	X, Y, F, Z, T, C, M, S, L, D, UW, integer
		Data address to execute the subtraction operation with S2
		0(h0000) to 65535(hFFFF)
S2	WORD	X, Y, F, Z, T, C, M, S, L, D, UW, integer
		Data address to execute the subtraction operation with S1
		0(h0000) to 65535(hFFFF)
D	WORD	Y, F, Z, T, C, M, S, L, D, UW
		Address to save the operation result
		0(h0000) to 65535(hFFFF)

Error	Zero	Carry	Borrow	Step
	◎		◎	7

<Ladder>



1. Subtracts the word value of S2 from the word value of S1 and then stores the result into the destination word D.
2. Executes the Unsigned operation.
3. If the result value is ‘h0000’ or out of this, borrow flag occurs.
4. If the result value is ‘h0000’, zero flag occurs.



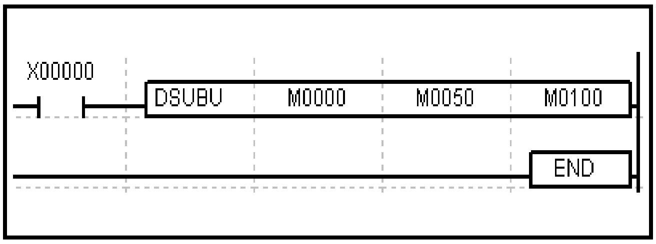
3.2.121 Arithmetic operation instruction(DSUBU)

Arithmetic operation instruction	DSUBU	S1	S2	D	Applicable model
					LP-S044, LP-S070

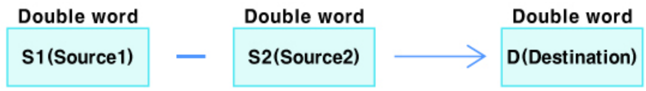
OP	DATA type	Available device / Description / Range
S1	DWORD	X, Y, F, Z, T, C, M, S, L, D, UW, integer
		Data address to execute the subtraction operation with S2
		0(h0000) to 4294967295(hFFFFFFFF)
S2	DWORD	X, Y, F, Z, T, C, M, S, L, D, UW, integer
		Data address to execute the subtraction operation with S1
		0(h0000) to 4294967295(hFFFFFFFF)
D	DWORD	Y, F, Z, T, C, M, S, L, D, UW
		Address to save the operation result
		0(h0000) to 4294967295(hFFFFFFFF)

Error	Zero	Carry	Borrow	Step
	◎		◎	7

<Ladder>



1. Subtract the double word value of S2 from the double word value of S1 and then store the result into the destination double word D.
2. Executes the Unsigned operation.
3. If the result value is ‘h00000000’ or out of this, borrow flag occurs.
4. If the result value ‘h00000000’, zero flag occurs.



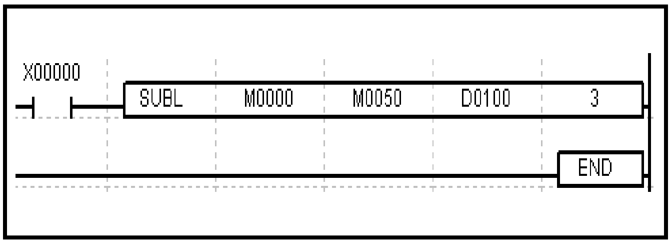
3.2.122 Arithmetic operation instruction(SUBL)

Arithmetic operation instruction	SUBL	S1	S2	D	N	N	Applicable model
							LP-S044, LP-S070

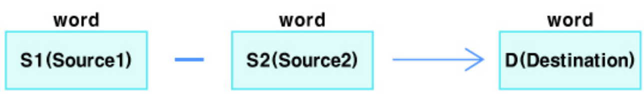
OP	DATA type	Available device / Description / Range
S1	INT	X, Y, F, Z, T, C, M, S, L, D, UW, integer
		Data address to execute the subtraction operation with S2
		-32768(h8000) to 32767(h7FFF)
S2	INT	X, Y, F, Z, T, C, M, S, L, D, UW
		Data address to execute the subtraction operation with S1
		-32768(h8000) to 32767(h7FFF)
D	INT	Y, F, Z, T, C, M, S, L, D, UW
		Address to save the operation result
		-32768(h8000) to 32767(h7FFF)
N	WORD	X, Y, F, Z, T, C, M, S, L, D, UW, integer
		The number of S2 data address and saved address to execute the operation with S1
		In the range within the corresponding device area of S2 and D

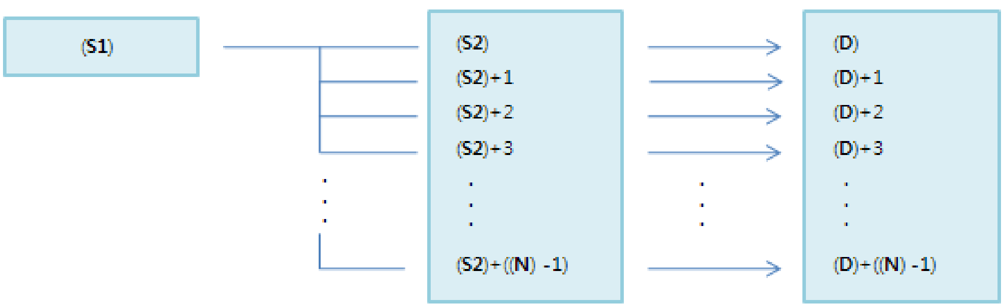
Error	Zero	Carry	Borrow	Step
	◎		◎	9

<Ladder>



1. Subtracts the number of N word values, which are from S2 to S2(N-1), from the double word value of S1 respectively, and then stores the result into the number of N corresponding destination doulble words beginning with the word D.
2. Executes the Signed operation.
(h8000(-32768) to hFFFF(-1) < 0 to h7FFF(32767))
3. If the result value is ‘h0000’, zero flag occurs.





3.2.123 Arithmetic operation instruction(DSUBL)

Arithmetic operation instruction **DSUBL** **S2** **D** **N**

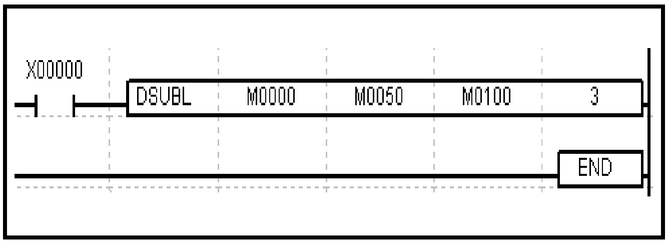
Applicable model

LP-S044, LP-S070

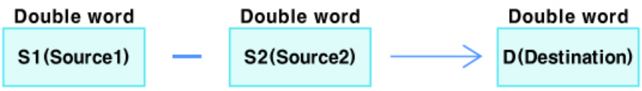
OP	DATA type	Available device / Description / Range
S1	DINT	X, Y, F, Z, T, C, M, S, L, D, UW, integer
		Data address to execute the subtraction operation with S2
		-2147483648(h80000000) to 2147483647(h7FFFFFFF)
S2	DINT	X, Y, F, Z, T, C, M, S, L, D, UW
		Data address to execute the subtraction operation with S1
		-2147483648(h80000000) to 2147483647(h7FFFFFFF)
D	DINT	Y, F, Z, T, C, M, S, L, D, UW
		Address to save the operation result
		-2147483648(h80000000) to 2147483647(h7FFFFFFF)
N	WORD	X, Y, F, Z, T, C, M, S, L, D, UW, integer
		The number of S2 data address and saved address to execute the operation with S1
		In the range within the corresponding device area of S2 and D

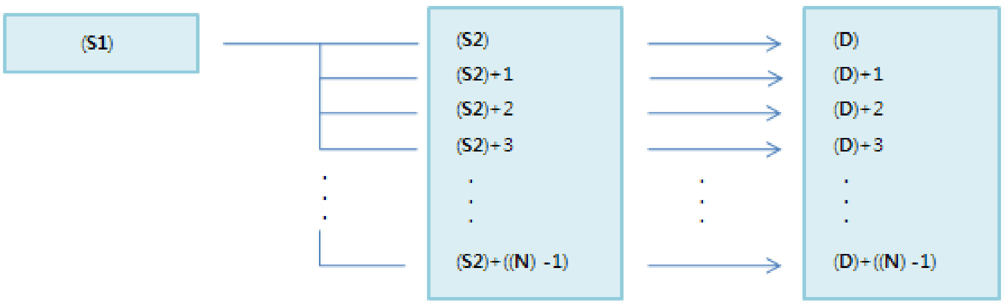
Error	Zero	Carry	Borrow	Step
	◎		◎	9

<Ladder>



1. Subtracts the number of N double word values, which are from S2 to S2(N-1), from double word value of S1 respectively, and then stores the result into the number of N corresponding destination double words beginning with the double word D.
2. Executes the Signed operation.
(h80000000(-2147483648) to hFFFFFFFF(-1) < 0 to h7FFFFFFF(2147483647))
3. If the result value is ‘h00000000’, zero flag occurs.





3.2.124 Arithmetic operation instruction(SUBLU)

Arithmetic operation instruction **SUBLU** **S1** **S2** **D** **N**

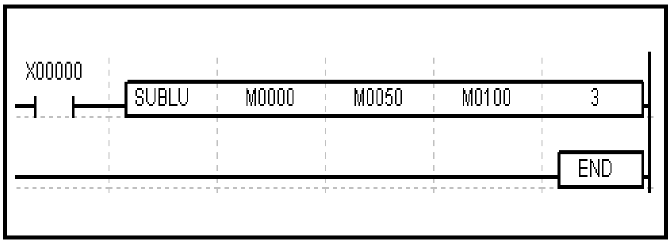
Applicable model

LP-S044, LP-S070

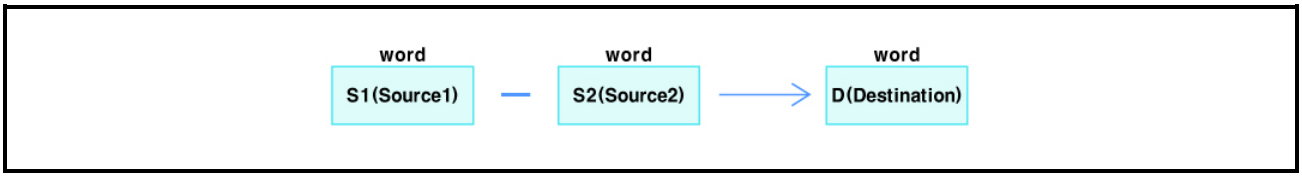
OP	DATA type	Available device / Description / Range
S1	WORD	X, Y, F, Z, T, C, M, S, L, D, UW, integer
		Data address to execute the subtraction operation with S2
		0(h0000) to 65535(hFFFF)
S2	WORD	X, Y, F, Z, T, C, M, S, L, D, UW
		Data address to execute the subtraction operation with S1
		0(h0000) to 65535(hFFFF)
D	WORD	Y, F, Z, T, C, M, S, L, D, UW
		Address to save the operation result
		0(h0000) to 65535(hFFFF)
N	WORD	X, Y, F, Z, T, C, M, S, L, D, UW, integer
		The number of S2 data address and saved address to execute the operation with S1
		In the range within the corresponding device area of S2 and D

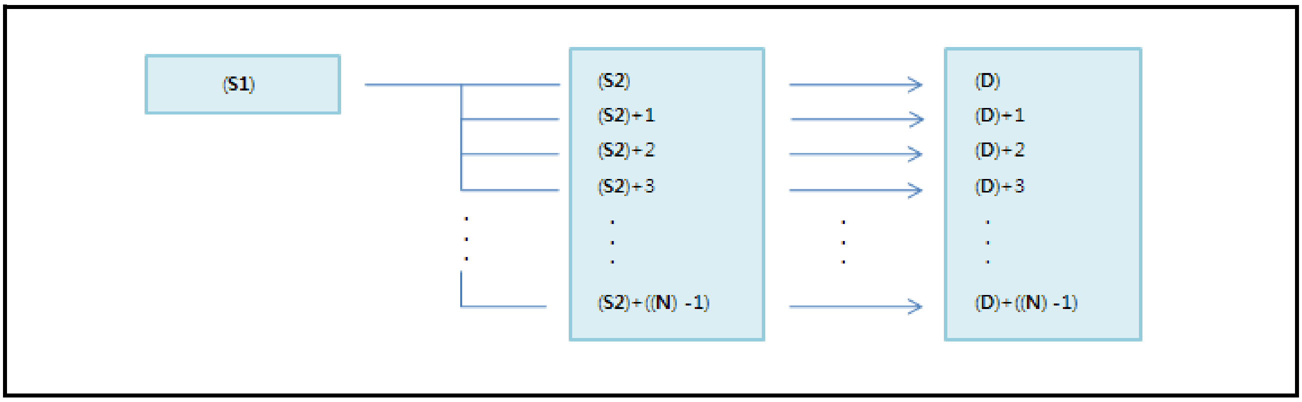
Error	Zero	Carry	Borrow	Step
	◎		◎	9

<Ladder>



1. Subtracts the number of N word values, which are from S2 to S2(N-1), from word value of S1 respectively, and then stores the result into the number of N corresponding destination words beginning with the word D.
2. Executes the Unsigned operation.
3. If the result value is ‘h0000’ or or out of this, borrow flag occurs.
4. If the result value is ‘h0000’, zero flag occurs.





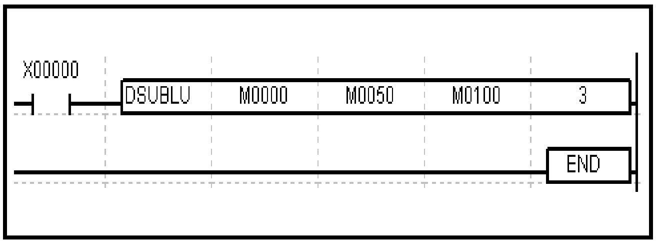
3.2.125 Arithmetic operation instruction(DSUBLU)

Arithmetic operation instruction	DSUBLU	S1	S2	D	N	Applicable model
						LP-S044, LP-S070

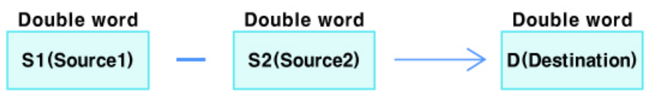
OP	DATA type	Available device / Description / Range
S1	DWORD	X, Y, F, Z, T, C, M, S, L, D, UW, integer
		Data address to execute the subtraction operation with S2
		0(h0000) to 4294967295(hFFFFFFFF)
S2	DWORD	X, Y, F, Z, T, C, M, S, L, D, UW
		Data address to execute the subtraction operation with S1
		0(h0000) to 4294967295(hFFFFFFFF)
D	DWORD	Y, F, Z, T, C, M, S, L, D, UW
		Address to save the operation result
		0(h0000) to 4294967295(hFFFFFFFF)
N	WORD	X, Y, F, Z, T, C, M, S, L, D, UW, integer
		The number of S2 data address and saved address to execute the operation with S1
		In the range within the corresponding device area of S2 and D

Error	Zero	Carry	Borrow	Step
	◎		◎	9

<Ladder>



1. Subtracts the number of N double word values, which are from S2 to S2(N-1), from double word value of S1 respectively, and then stores the result into the number of N corresponding destination beginning with the double word D.
2. Executes the Unsigned operation.
3. If the result value is ‘h00000000’ or out of this, borrow flag occurs.
4. If the result value ‘h00000000’, zero flag occurs.



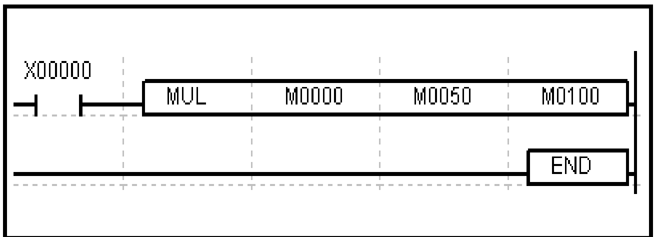
3.2.126 Arithmetic operation instruction(MUL)

Arithmetic operation instruction	MUL	S1	S2	D	Applicable model
					LP-S044, LP-S070

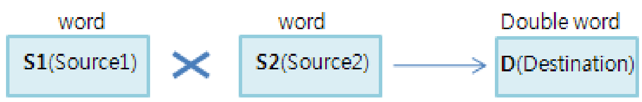
OP	DATA type	Available device / Description / Range
S1	INT	X, Y, F, Z, T, C, M, S, L, D, UW, integer
		Data address to execute the multiplication with S2
		-32768(h8000) to 32767(h7FFF)
S2	INT	X, Y, F, Z, T, C, M, S, L, D, UW, integer
		Data address to execute the multiplication with S1
		-32768(h8000) to 32767(h7FFF)
D	DINT	Y, F, Z, T, C, M, S, L, D, UW
		Address to save the operation result
		-2147483648(h80000000) to 2147483647(hFFFFFFFF)

Error	Zero	Carry	Borrow	Step
	◎	◎		7

<Ladder>



1. Multiplies the word value of S1 and that of S2, and then stores the result into the destination double word "D".
2. Executes the Signed operation.
3. If the result value is '0', zero flag occurs.



3.2.127 Arithmetic operation instruction(DMUL)

Arithmetic operation instruction **DMUL** **S1** **S2** **D**

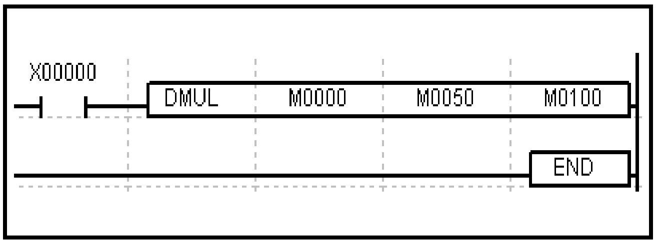
Applicable model

LP-S044, LP-S070

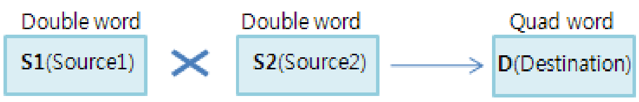
OP	DATA type	Available device / Description / Range
S1	DINT	X, Y, F, Z, T, C, M, S, L, D, UW, integer
		Data address to execute the multiplication with S2
		-2147483648(h80000000) to 2147483647(hFFFFFFFF)
S2	DINT	X, Y, F, Z, T, C, M, S, L, D, UW, integer
		Data address to execute the multiplication with S1
		-2147483648(h80000000) to 2147483647(hFFFFFFFF)
D	QWORD	Y, F, Z, T, C, M, S, L, D, UW
		Address to save the operation result

Error	Zero	Carry	Borrow	Step
	◎	◎		7

<Ladder>



1. Multiplies the double word value of S1 and that of S2, and then stores the result into the destination “Quad Word D”.
2. Executes the Signed operation.
3. If the result value is ‘0’, zero flag is SET.



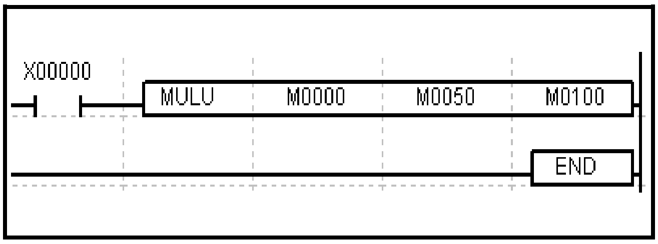
3.2.128 Arithmetic operation instruction(MULU)

Arithmetic operation instruction	MULU	S1	S2	D	Applicable model
					LP-S044, LP-S070

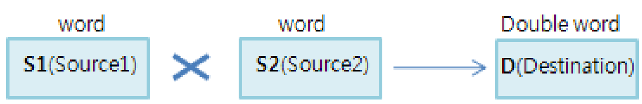
OP	DATA type	Available device / Description / Range
S1	WORD	X, Y, F, Z, T, C, M, S, L, D, UW, integer
		Data address to execute the multiplication with S2
		0(h0000) to 65535(hFFFF)
S2	WORD	X, Y, F, Z, T, C, M, S, L, D, UW, integer
		Data address to execute the multiplication with S1
		0(h0000) to 65535(hFFFF)
D	DWORD	Y, F, Z, T, C, M, S, L, D, UW
		Address to save the operation result
		0(h0000) to 4294967295(hFFFFFFFF)

Error	Zero	Carry	Borrow	Step
	◎	◎		7

<Ladder>



1. Multiplies the word value of S1 and that of S2, and then stores the result into the destination “Double Word DW”.
2. Executes the Unsigned operation.
3. If the result value is ‘0’, zero flag occurs.



3.2.129 Arithmetic operation instruction(DMULU)

Arithmetic operation instruction **DMULU** **S1** **S2** **D**

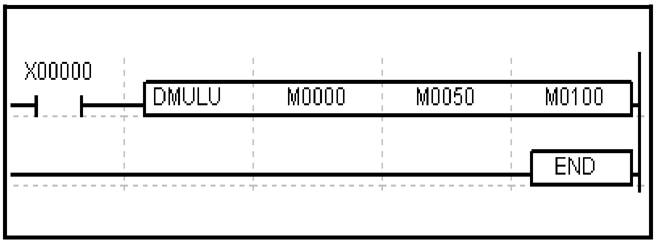
Applicable model

LP-S044, LP-S070

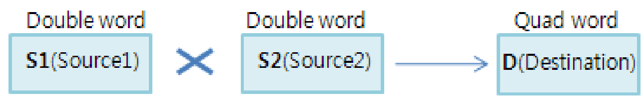
OP	DATA type	Available device / Description / Range
S1	DWORD	X, Y, F, Z, T, C, M, S, L, D, UW, integer
		Data address to execute the multiplication with S2
		0(h0000) to 4294967295(hFFFFFFFF)
S2	DWORD	X, Y, F, Z, T, C, M, S, L, D, UW, integer
		Data address to execute the multiplication with S1
		0(h0000) to 4294967295(hFFFFFFFF)
D	QWORD	Y, F, Z, T, C, M, S, L, D, UW
		Address to save the operation result

Error	Zero	Carry	Borrow	Step
	◎	◎		7

<Ladder>



1. Multiplies the double word value of S1 and that of S2, and then stores the result into the destination "Quad Word D".
2. Executes the Unsigned operation.
3. If the result value is '0', zero flag occurs.



3.2.130 Arithmetic operation instruction(MULL)

Arithmetic operation instruction | **MULL** | **S1** | **S2** | **D** | **N**

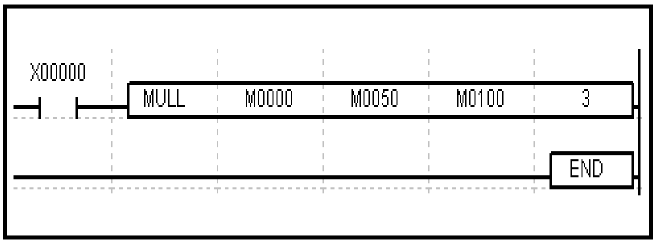
Applicable model

LP-S044, LP-S070

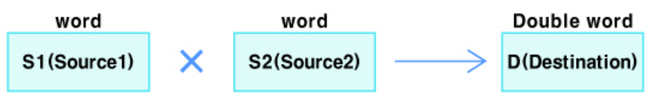
OP	DATA type	Available device / Description / Range
S1	INT	X, Y, F, Z, T, C, M, S, L, D, UW, integer
		Data address to execute the multiplication with S2
		-32768(h8000) to 32767(h7FFF)
S2	INT	X, Y, F, Z, T, C, M, S, L, D, UW
		Data address to execute the multiplication with S1
		-32768(h8000) to 32767(h7FFF)
D	DINT	Y, F, Z, T, C, M, S, L, D, UW
		Address to save the operation result
		-2147483648(h80000000) to 2147483647(hFFFFFFFF)
N	WORD	X, Y, F, Z, T, C, M, S, L, D, UW, integer
		The number of S2 data address and saved address to execute the operation with S1
		In the range within the corresponding device area of S2 and D

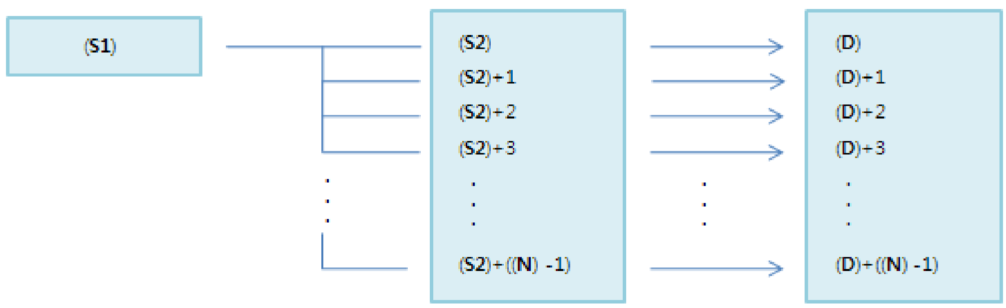
Error	Zero	Carry	Borrow	Step
	◎	◎		9

<Ladder>



1. Multiplies the word value of S1 and the number of N word values, which are from S2 to S2(N-1), respectively, and then stores the result into the number of corresponding destination double words beginning with double word D.
2. Executes the Signed operation.
3. Any one of the results is ‘0’, zero flag occurs.





3.2.131 Arithmetic operation instruction(DMULL)

Arithmetic operation instruction **DMULL** **S1** **S2** **D** **N**

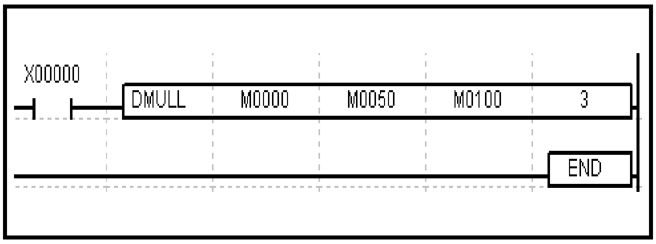
Applicable model

LP-S044, LP-S070

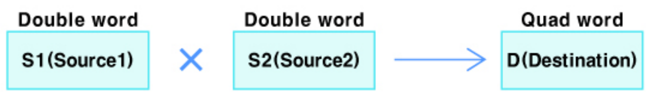
OP	DATA type	Available device / Description / Range
S1	DINT	X, Y, F, Z, T, C, M, S, L, D, UW, integer
		Data address to execute the multiplication with S2
		-2147483648(h80000000) to 2147483647(h7FFFFFFF)
S2	DINT	X, Y, F, Z, T, C, M, S, L, D, UW
		Data address to execute the multiplication with S1
		-2147483648(h80000000) to 2147483647(h7FFFFFFF)
D	QINT	Y, F, Z, T, C, M, S, L, D, UW
		Address to save the operation result
N	WORD	X, Y, F, Z, T, C, M, S, L, D, UW, integer
		The number of S2 data address and saved address to execute the operation with S1
		In the range within the corresponding device area of S2 and D

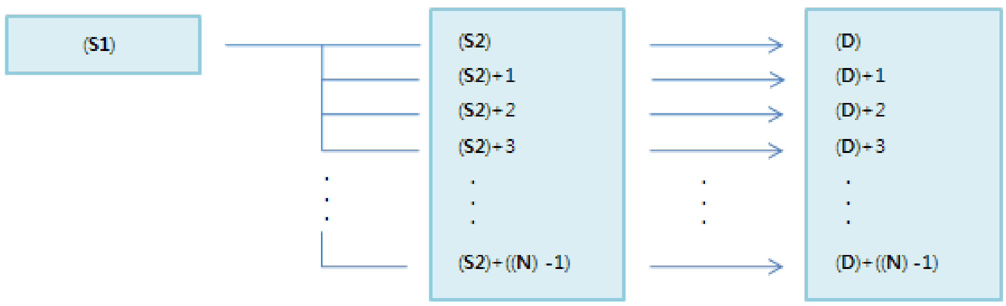
Error	Zero	Carry	Borrow	Step
	◎	◎		9

<Ladder>



1. Multiplies the double word value of S1 and the number of N double word values, which are from S2 to S2(N-1), respectively, and then stores the result into the number of corresponding destination quad words beginning with D.
2. Executes the Signed operation.
3. Any one of the results is ‘0’, zero flag occurs.





3.2.132 Arithmetic operation instruction(MULLU)

Arithmetic operation instruction **MULLU** **S1** **S2** **D** **N**

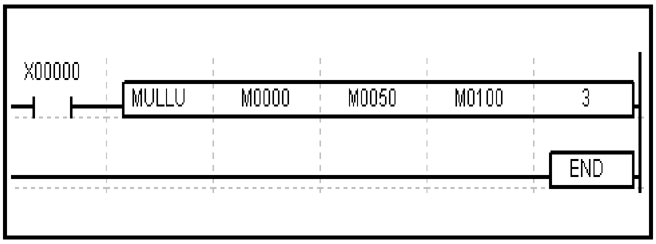
Applicable model

LP-S044, LP-S070

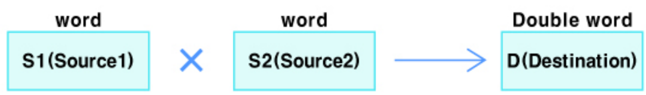
OP	DATA type	Available device / Description / Range
S1	WORD	X, Y, F, Z, T, C, M, S, L, D, UW, integer
		Data address to execute the multiplication with S2
		0(h0000) to 65535(hFFFF)
S2	WORD	X, Y, F, Z, T, C, M, S, L, D, UW
		Data address to execute the multiplication with S1
		0(h0000) to 65535(hFFFF)
D	DWORD	Y, F, Z, T, C, M, S, L, D, UW
		Address to save the operation result
		0(h0000) to 4294967295(hFFFFFFFF)
N	WORD	X, Y, F, Z, T, C, M, S, L, D, UW, integer
		The number of S2 data address and saved address to execute the operation with S1
		In the range within the corresponding device area of S2 and D

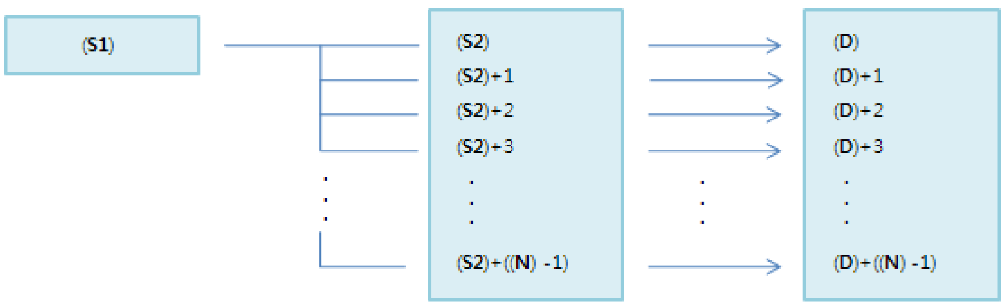
Error	Zero	Carry	Borrow	Step
	◎	◎		9

<Ladder>



1. Multiplies the word value of S1 and the number of N word values, which are from S2 to S2(N-1) respectively, and then stores the result into the number of corresponding destination double words beginning with double word D one by one.
2. Executes the Unsigned operation.
3. Any one of the results is ‘0’, zero flag occurs.





3.2.133 Arithmetic operation instruction(DMULLU)

Arithmetic operation instruction **DMULLU S1 S2 D N**

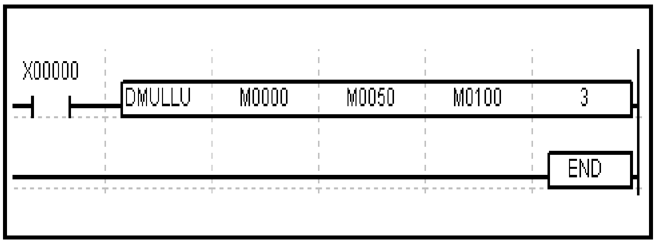
Applicable model

LP-S044, LP-S070

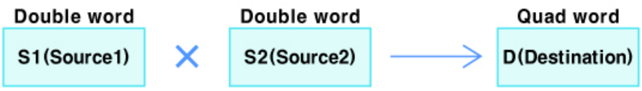
OP	DATA type	Available device / Description / Range
S1	DWORD	X, Y, F, Z, T, C, M, S, L, D, UW, integer
		Data address to execute the multiplication with S2
		0(h0000) to 4294967295(hFFFFFFFF)
S2	DWORD	X, Y, F, Z, T, C, M, S, L, D, UW
		Data address to execute the multiplication with S1
		0(h0000) to 4294967295(hFFFFFFFF)
D	QWORD	Y, F, Z, T, C, M, S, L, D, UW
		Address to save the operation result
N	WORD	X, Y, F, Z, T, C, M, S, L, D, UW, integer
		The number of S2 data address and saved address to execute the operation with S1
		In the range within the corresponding device area of S2 and D

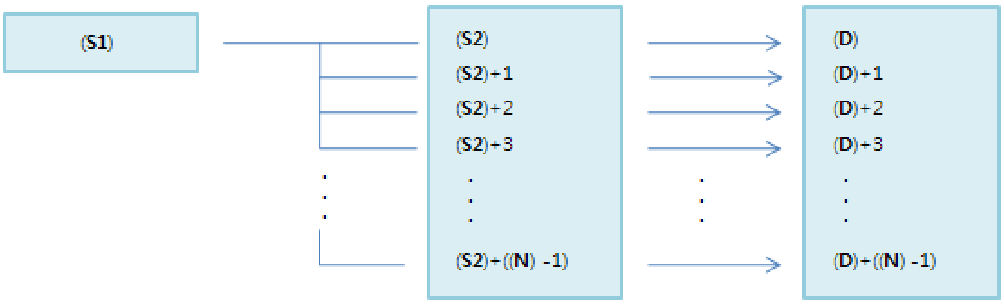
Error	Zero	Carry	Borrow	Step
	◎	◎		9

<Ladder>



1. Multiplies the double word value of S1 and the number of N double word values, which are from S2 to S2(N-1), and then stores the result into the number of N corresponding destination quad words beginning with quad word D one by one.
2. Executes the Unsigned operation.
3. Any one of the results is ‘0’, zero flag occurs.





3.2.134 Arithmetic operation instruction(DIV)

Arithmetic operation instruction **DIV** **S1** **S2** **D**

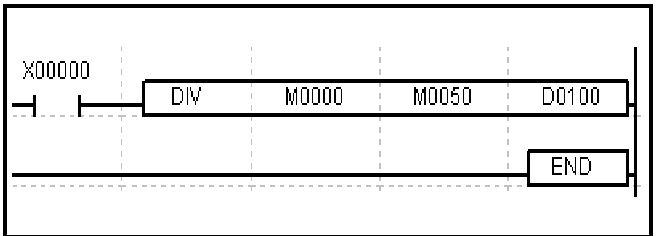
Applicable model

LP-S044, LP-S070

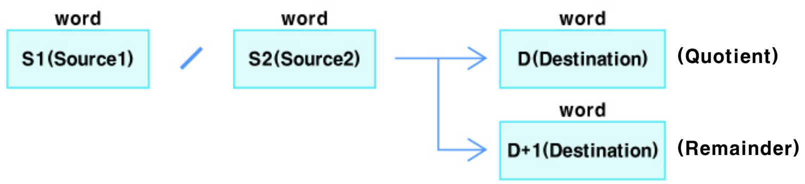
OP	DATA type	Available device / Description / Range
S1	INT	X, Y, F, Z, T, C, M, S, L, D, UW, integer
		Data address to execute the division operation with S2
		-32768(h8000) to 32767(h7FFF)
S2	INT	X, Y, F, Z, T, C, M, S, L, D, UW, integer
		Data address to execute the division operation with S1
		-32768(h8000) to 32767(h7FFF)
D	INT	Y, F, Z, T, C, M, S, L, D, UW
		Address to save the operation result
		-32768(h8000) to 32767(h7FFF)

Error	Zero	Carry	Borrow	Step
◎	◎			7

<Ladder>



1. Divides the word value of S1 by that of S2 and then stores the quotient and the remainder into the destination “Word D” and “Word D+1” respectively.
2. Executes the Signed operation.
3. If the divisor is 0, error flag is SET.
4. If the dividend is 0, zero flag is SET.



3.2.135 Arithmetic operation instruction(DDIV)

Arithmetic operation instruction   DDIV   S1   S2   D

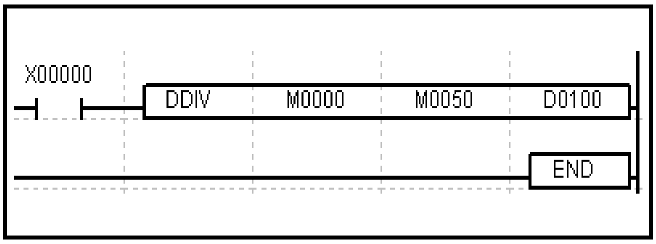
Applicable model

LP-S044, LP-S070

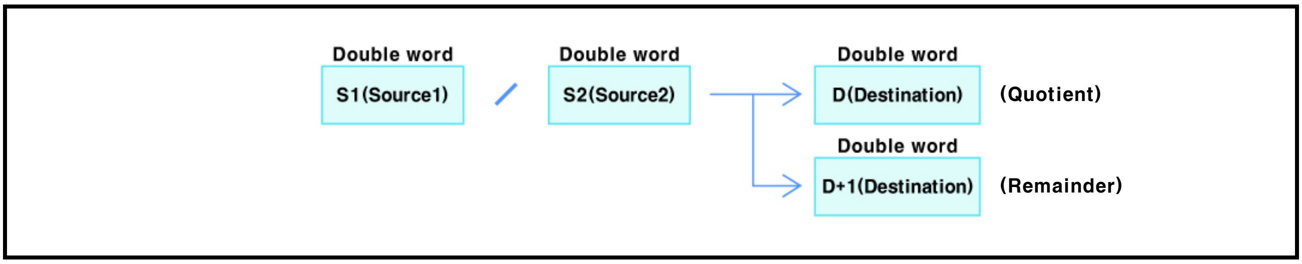
OP	DATA type	Available device / Description / Range
S1	DINT	X, Y, F, Z, T, C, M, S, L, D, UW, integer
		Data address to execute the division operation with S2
		-2147483648(h80000000) to 2147483647(hFFFFFFFF)
S2	DINT	X, Y, F, Z, T, C, M, S, L, D, UW, integer
		Data address to execute the division operation with S1
		-2147483648(h80000000) to 2147483647(hFFFFFFFF)
D	DINT	Y, F, Z, T, C, M, S, L, D, UW
		Address to save the operation result
		-2147483648(h80000000) to 2147483647(hFFFFFFFF)

Error	Zero	Carry	Borrow	Step
◎	◎			7

<Ladder>



1. Divides the double word value of S1 by that of S2 and then stores the quotient and the remainder into the destination “Double Word D” and “Double Word D+1” respectively.
2. Executes the Signed operation.
3. If the divisor is 0, error flag is SET.
4. If the dividend is 0, zero flag is SET.



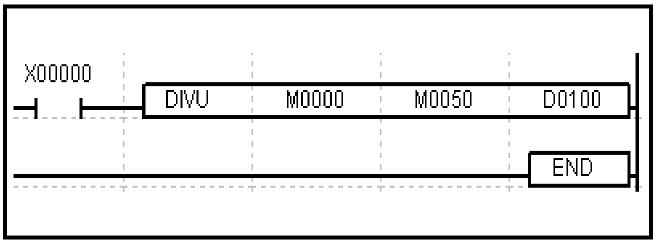
3.2.136 Arithmetic operation instruction(DIVU)

Arithmetic operation instruction	DIVU	S1	S2	D	Applicable model
					LP-S044, LP-S070

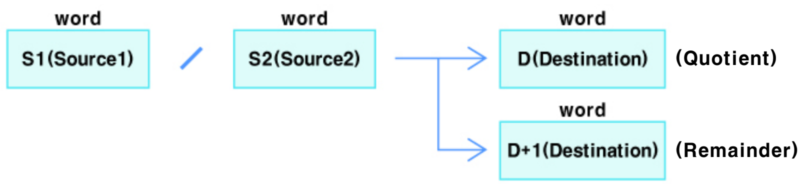
OP	DATA type	Available device / Description / Range
S1	WORD	X, Y, F, Z, T, C, M, S, L, D, UW, integer
		Data address to execute the division operation with S2
		0(h0000) to 65535(hFFFF)
S2	WORD	X, Y, F, Z, T, C, M, S, L, D, UW, integer
		Data address to execute the division operation with S1
		0(h0000) to 65535(hFFFF)
D	WORD	Y, F, Z, T, C, M, S, L, D, UW
		Address to save the operation result
		0(h0000) to 65535(hFFFF)

Error	Zero	Carry	Borrow	Step
◎	◎			7

<Ladder>



1. Divides the word value of S1 by that of S2 and then stores the quotient and the remainder into the destination “Word D” and “Word D+1” respectively.
2. Executes the Unsigned operation.
3. If the divisor is 0, error flag is SET.
4. If the dividend is 0, zero flag is SET.



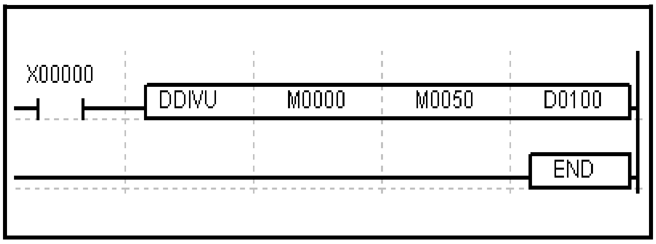
3.2.137 Arithmetic operation instruction(DDIVU)

Arithmetic operation instruction	DDIVU	S1	S2	D	Applicable model
					LP-S044, LP-S070

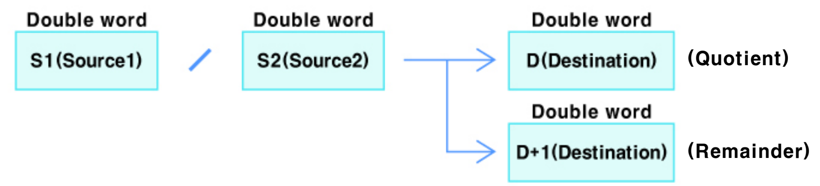
OP	DATA type	Available device / Description / Range
S1	DWORD	X, Y, F, Z, T, C, M, S, L, D, UW, integer
		Data address to execute the division operation with S2
		0(h0000) to 4294967295(hFFFFFFFF)
S2	DWORD	X, Y, F, Z, T, C, M, S, L, D, UW, integer
		Data address to execute the division operation with S1
		0(h0000) to 4294967295(hFFFFFFFF)
D	DWORD	Y, F, Z, T, C, M, S, L, D, UW
		Address to save the operation result
		0(h0000) to 4294967295(hFFFFFFFF)

Error	Zero	Carry	Borrow	Step
◎	◎			7

<Ladder>



1. Divides the double word value of S1 by that of S2 and then stores the quotient and the remainder into the destination “Double Word D” and “Double Word D+1” respectively.
2. Executes the Unsigned operation.
3. If the divisor is 0, error flag is SET.
4. If the dividend is 0, zero flag is SET.



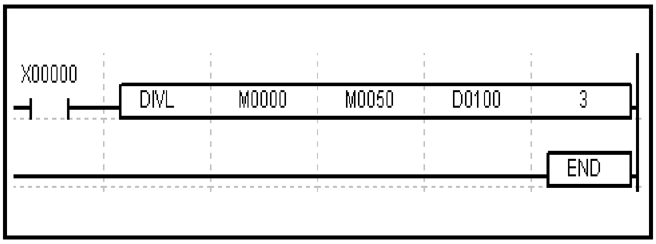
3.2.138 Arithmetic operation instruction(DIVL)

Arithmetic operation instruction	DIVL	S1	S2	D	N	Applicable model
						LP-S044, LP-S070

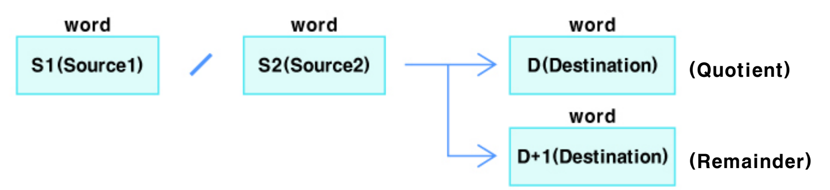
OP	DATA type	Available device / Description / Range
S1	INT	X, Y, F, Z, T, C, M, S, L, D, UW, integer
		Data address to execute the division operation with S2
		-32768(h8000) to 32767(h7FFF)
S2	INT	X, Y, F, Z, T, C, M, S, L, D, UW
		Data address to execute the division operation with S1
		-32768(h8000) to 32767(h7FFF)
D	INT	Y, F, Z, T, C, M, S, L, D, UW
		Address to save the operation result
		-32768(h8000) to 32767(h7FFF)
N	WORD	X, Y, F, Z, T, C, M, S, L, D, UW, integer
		The number of S2 data address and saved address to execute the operation with S1
		In the range within the corresponding device area of S2 and D

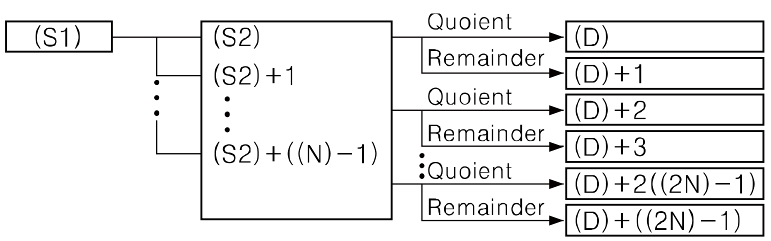
Error	Zero	Carry	Borrow	Step
◎	◎			9

<Ladder>



1. Divides the word value of S1 by the number of N word values beginning with S2 and then stores the quotient and the remainder into the destination “Word D” and “Word D+1” respectively.
2. Executes the Signed operation.
3. If the divisor is 0, error flag is SET.
4. If the dividend is 0, zero flag is SET.





3.2.139 Arithmetic operation instruction(DDIVL)

Arithmetic operation instruction	DDIVL	S1	S2	D	N

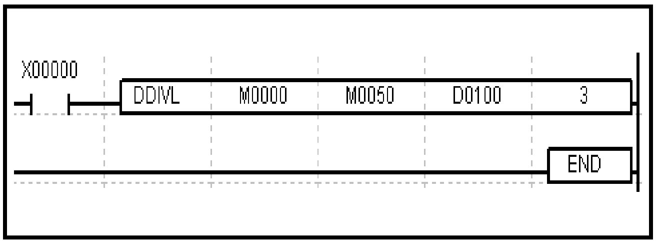
Applicable model

LP-S044, LP-S070

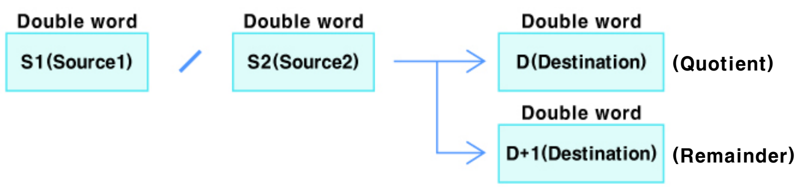
OP	DATA type	Available device / Description / Range
S1	DINT	X, Y, F, Z, T, C, M, S, L, D, UW, integer
		Data address to execute the division operation with S2
		-2147483648(h80000000) to 2147483647(hFFFFFFFF)
S2	DINT	X, Y, F, Z, T, C, M, S, L, D, UW
		Data address to execute the division operation with S1
		-2147483648(h80000000) to 2147483647(hFFFFFFFF)
D	DINT	Y, F, Z, T, C, M, S, L, D, UW
		Address to save the operation result
		-2147483648(h80000000) to 2147483647(hFFFFFFFF)
N	WORD	X, Y, F, Z, T, C, M, S, L, D, UW, integer
		The number of S2 data address and saved address to execute the operation with S1
		In the range within the corresponding device area of S2 and D

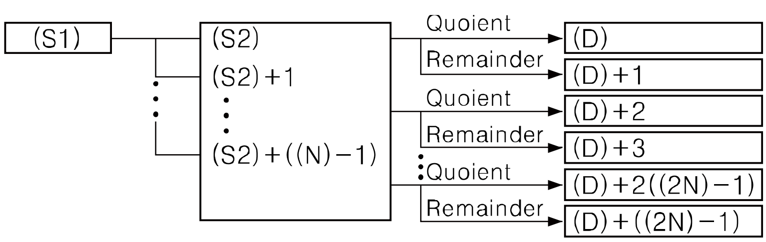
Error	Zero	Carry	Borrow	Step
◎	◎			9

<Ladder>



1. Divides the double word value of S1 by the number of N double word values beginning with S2 and then stores the quotient and the remainder into the destination "Double Word D" and "Double Word D+1" respectively.
2. Executes the Signed operation.
3. If the divisor is 0, error flag is SET.
4. If the dividend is 0, zero flag is SET.





3.2.140 Arithmetic operation instruction(DIVLU)

Arithmetic operation instruction	DIVLU	S1	S2	D	N

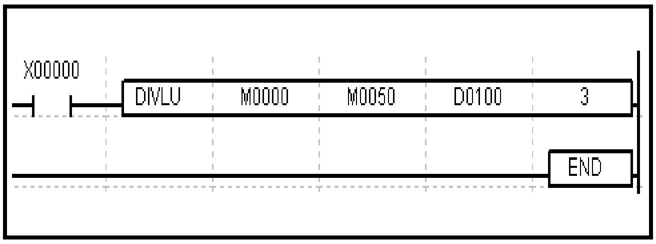
Applicable model

LP-S044, LP-S070

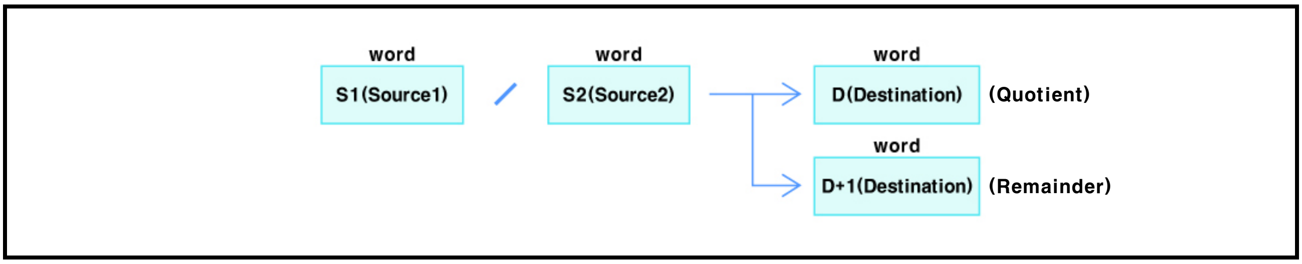
OP	DATA type	Available device / Description / Range
S1	WORD	X, Y, F, Z, T, C, M, S, L, D, UW, integer
		Data address to execute the division operation with S2
		0(h0000) to 65535(hFFFF)
S2	WORD	X, Y, F, Z, T, C, M, S, L, D, UW
		Data address to execute the division operation with S1
		0(h0000) to 65535(hFFFF)
D	WORD	Y, F, Z, T, C, M, S, L, D, UW
		Address to save the operation result
		0(h0000) to 65535(hFFFF)
N	WORD	X, Y, F, Z, T, C, M, S, L, D, UW, integer
		The number of S2 data address and saved address to execute the operation with S1
		In the range within the corresponding device area of S2 and D

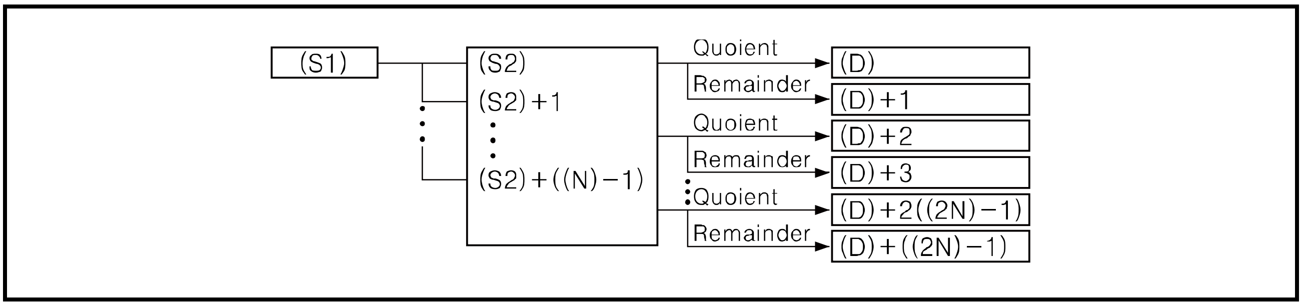
Error	Zero	Carry	Borrow	Step
◎	◎			9

<Ladder>



1. Divides the word value of S1 by the number of N word values beginning with S2 and then stores the quotient and the remainder into the destination "Word D" and "Word D+1" respectively.
2. Executes the Unsigned operation.
3. If the divisor is 0, error flag is SET.
4. If the dividend is 0, zero flag is SET.





3.2.141 Arithmetic operation instruction(DDIVLU)

Arithmetic operation instruction **DDIVLU** **S1** **S2** **D** **N**

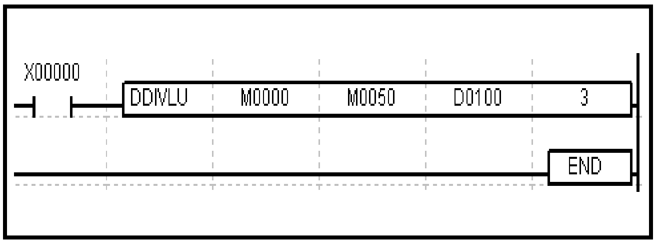
Applicable model

LP-S044, LP-S070

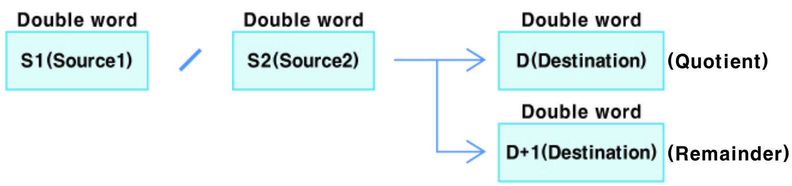
OP	DATA type	Available device / Description / Range
S1	DWORD	X, Y, F, Z, T, C, M, S, L, D, UW, integer
		Data address to execute the division operation with S2
		0(h0000) to 4294967295(hFFFFFFFF)
S2	DWORD	X, Y, F, Z, T, C, M, S, L, D, UW
		Data address to execute the division operation with S1
		0(h0000) to 4294967295(hFFFFFFFF)
D	DWORD	Y, F, Z, T, C, M, S, L, D, UW
		Address to save the operation result
		0(h0000) to 4294967295(hFFFFFFFF)
N	WORD	X, Y, F, Z, T, C, M, S, L, D, UW, integer
		The number of S2 data address and saved address to execute the operation with S1
		In the range within the corresponding device area of S2 and D

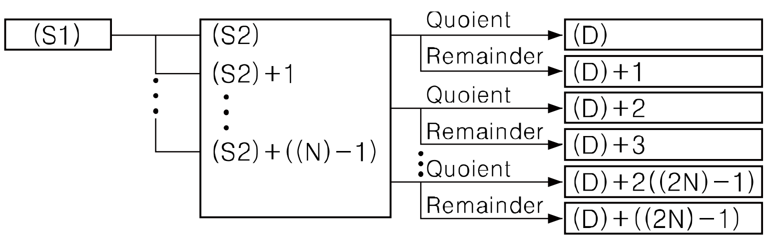
Error	Zero	Carry	Borrow	Step
◎	◎			9

<Ladder>



1. Divides the double word value of S1 by the number of N double word values beginning with S2 and then stores the quotient and the remainder into the destination “Double Word D” and “Double Word D+1” respectively.
2. Executes the Unsigned operation.
3. If the divisor is 0, error flag is SET.
4. If the dividend is 0, zero flag is SET.





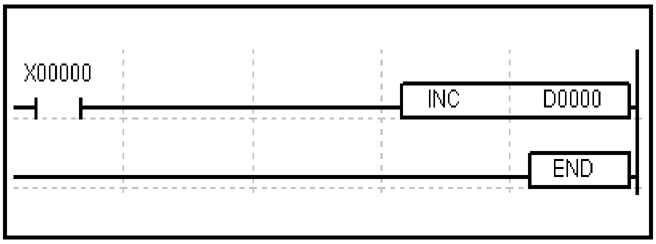
3.2.142 Arithmetic operation instruction(INC)

Arithmetic operation instruction	INC	D	Applicable model
			LP-S044, LP-S070

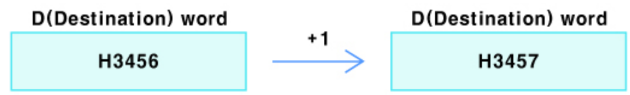
OP	DATA type	Available device / Description / Range
D	WORD	Y, F, Z, T, C, M, S, L, D, UW
		Data address to execute the operation
		0(h0000) to 65535(hFFFF)

Error	Zero	Carry	Borrow	Step
	◎	◎		3

<Ladder>



1. Increases the value of destination word D by ‘1’.
2. If the value is increased from the maximum value by 1 and then becomes 0, zero flag and carry flag are SET.



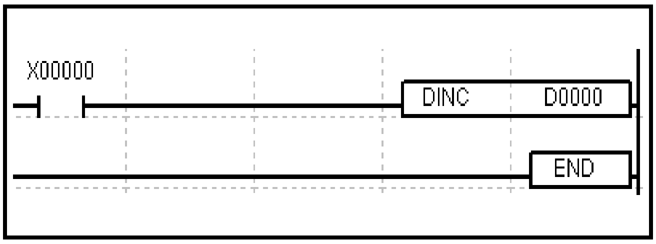
3.2.143 Arithmetic operation instruction(DINC)

Arithmetic operation instruction	DINC	D	Applicable model
			LP-S044, LP-S070

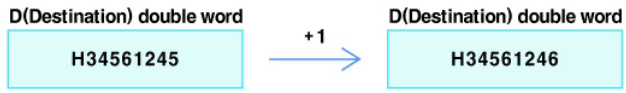
OP	DATA type	Available device / Description / Range
D	DWORD	Y, F, Z, T, C, M, S, L, D, UW
		Data address to execute the operation
		0(h0000) to 4294967295(hFFFFFFFF)

Error	Zero	Carry	Borrow	Step
	◎	◎		3

<Ladder>



1. Increases the value of destination double word D by '1'.
2. If the value is increased from the maximum value by 1 and then D value becomes 0, zero flag and carry flag are SET.



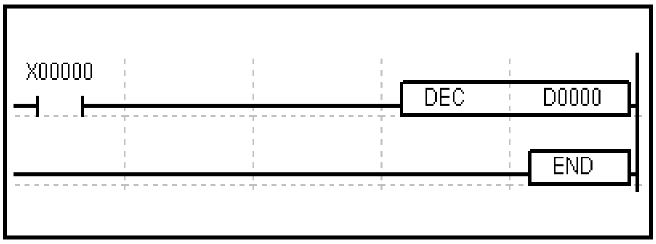
3.2.144 Arithmetic operation instruction(DEC)

Arithmetic operation instruction	DEC	D	Applicable model
			LP-S044, LP-S070

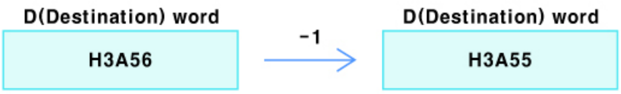
OP	DATA type	Available device / Description / Range
D	WORD	Y, F, Z, T, C, M, S, L, D, UW
		Data address to execute the operation
		0(h0000) to 65535(hFFFF)

Error	Zero	Carry	Borrow	Step
	◎		◎	3

<Ladder>



1. Decreases the value of destination word D by ‘1’.
2. If D value is ‘0’, zero flag is SET.
3. If D value is decreased again from ‘0’, borrow flag is SET.



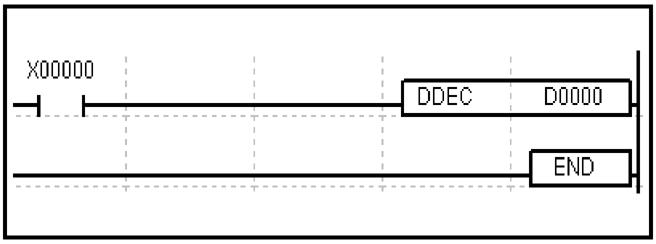
3.2.145 Arithmetic operation instruction(DDEC)

Arithmetic operation Instruction	DDEC	D	Applicable model
			LP-S044, LP-S070

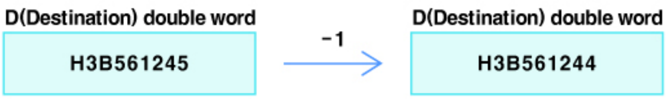
OP	DATA type	Available device / Description / Range
D	DWORD	Y, F, Z, T, C, M, S, L, D, UW
		Data address to execute the operation
		0(h0000) to 4294967295(hFFFFFFFF)

Error	Zero	Carry	Borrow	Step
	◎		◎	3

<Ladder>



1. Decreases the value of destination double word D by '1'.
2. If D value is '0', zero flag is SET.
3. If D value is decreased again from '0', carry flag is SET.



3.2.146 Arithmetic operation instruction(ADDB)

Arithmetic operation instruction **ADDB** **S1** **S2** **D**

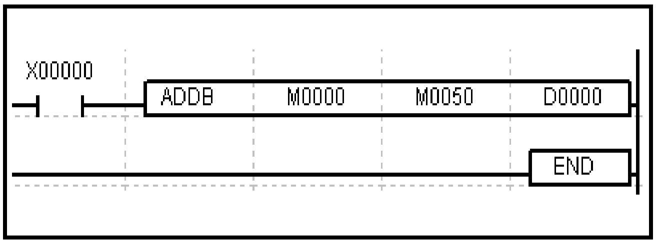
Applicable model

LP-S044, LP-S070

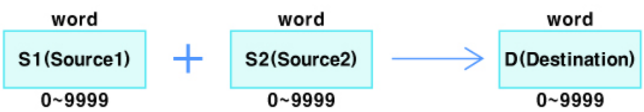
OP	DATA type	Available device / Description / Range
S1	WORD	X, Y, F, Z, T, C, M, S, L, D, UW, integer
		Data address to execute the BCD addition operation with S2
		h0000 to h9999
S2	WORD	X, Y, F, Z, T, C, M, S, L, D, UW, integer
		Data address to execute the BCD addition operation with S1
		h0000 to h9999
D	WORD	Y, F, Z, T, C, M, S, L, D, UW
		Address to save the operation result
		h0000 to h9999

Error	Zero	Carry	Borrow	Step
◎	◎	◎		7

<Ladder>



1. Adds the word value of S1 and that of S2, both are composed of BCD codes, and then stores the result into the destination word D as BCD code.
2. If any of the value not composed of the BCD code is detected in S1 and S2, error flag is SET. (Except 0 to 9999)
3. If the result value is out of the range of D, carry flag is SET.
4. If the result value is '0', zero flag is SET.



3.2.147 Arithmetic operation instruction(DADDB)

Arithmetic operation instruction **DADDB** **S1** **S2** **D**

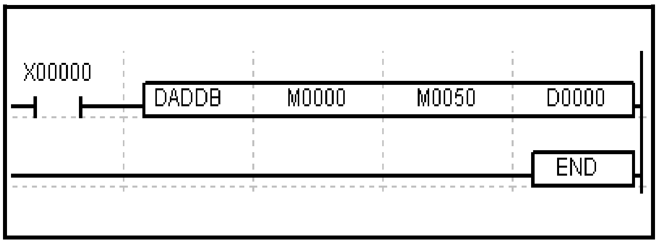
Applicable model

LP-S044, LP-S070

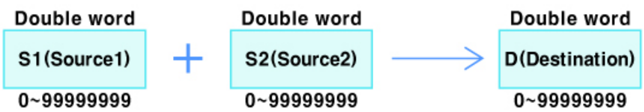
OP	DATA type	Available device / Description / Range
S1	DWORD	X, Y, F, Z, T, C, M, S, L, D, UW, integer
		Data address to execute the BCD addition operation with S2
		h00000000 to h99999999
S2	DWORD	X, Y, F, Z, T, C, M, S, L, D, UW, integer
		Data address to execute the BCD addition operation with S1
		h00000000 to h99999999
D	DWORD	Y, F, Z, T, C, M, S, L, D, UW
		Address to save the operation result
		h00000000 to h99999999

Error	Zero	Carry	Borrow	Step
◎	◎	◎		7

<Ladder>



1. Adds the double word values of S1 and S2, both are composed of BCD codes, and then stores the result into the destination double word D as BCD codes.
2. If any of the value not composed of the BCD code is detected in S1 and S2, error flag is SET. (Except 0 to 99999999)
3. If the result value is out of the range of D, carry flag is SET.
4. If the result value is ‘0’ , zero flag is SET.



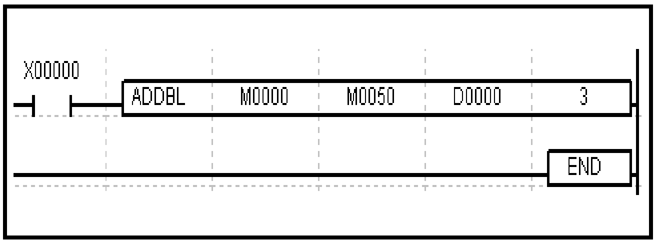
3.2.148 Arithmetic operation instruction(ADDBL)

Arithmetic operation instruction	ADDBL	S1	S2	D	N	Applicable model
						LP-S044, LP-S070

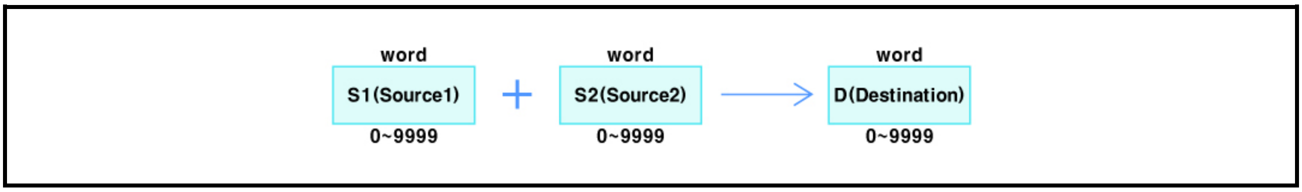
OP	DATA type	Available device / Description / Range
S1	WORD	X, Y, F, Z, T, C, M, S, L, D, UW, integer
		Data address to execute the BCD addition operation with S2
		h0000 to h9999
S2	WORD	X, Y, F, Z, T, C, M, S, L, D, UW
		Data address to execute the BCD addition operation with S1
		h0000 to h9999
D	WORD	Y, F, Z, T, C, M, S, L, D, UW
		Address to save the operation result
		h0000 to h9999
N	WORD	X, Y, F, Z, T, C, M, S, L, D, UW, integer
		The number of S2 data address and saved address to execute the operation with S1
		In the range within the corresponding device area of S2 and D

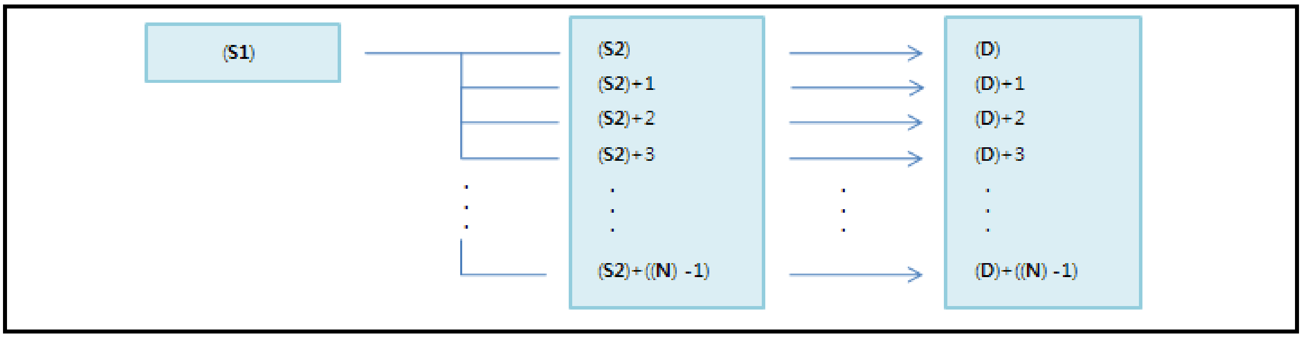
Error	Zero	Carry	Borrow	Step
◎	◎	◎		9

<Ladder>



1. Adds the word value of S1 composed of BCD code and the number of N word values beginning with S2 also composed of BCD code, respectively, and then stores the result into the number of N destination words beginning with D as BCD code.
2. If any of the value not composed of the BCD code is detected in S1 and S2, error flag is SET.
3. If any of the result value from D to D+N is out of the D range, carry flag is SET.
4. If any of the result value from D to D+N is 0, zero flag is SET.





3.2.149 Arithmetic operation instruction(DADDBL)

Arithmetic operation instruction **DADDBL** **S1** **S2** **D** **N**

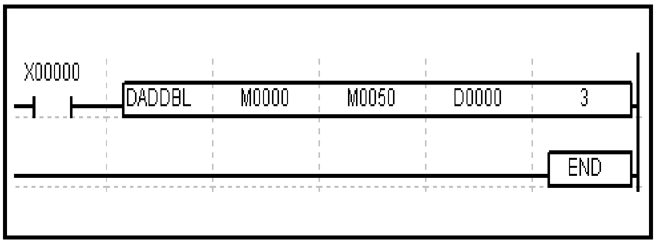
Applicable model

LP-S044, LP-S070

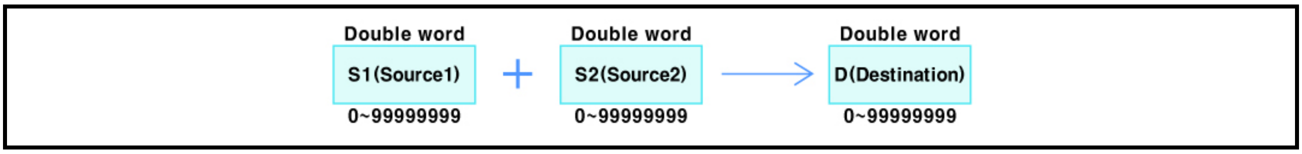
OP	DATA type	Available device / Description / Range
S1	DWORD	X, Y, F, Z, T, C, M, S, L, D, UW, integer
		Data address to execute the BCD addition operation with S2
		h00000000 to h99999999
S2	DWORD	X, Y, F, Z, T, C, M, S, L, D, UW
		Data address to execute the BCD addition operation with S1
		h00000000 to h99999999
D	DWORD	Y, F, Z, T, C, M, S, L, D, UW
		Address to save the operation result
		h00000000 to h99999999
N	WORD	X, Y, F, Z, T, C, M, S, L, D, UW, integer
		The number of S2 data address and saved address to execute the operation with S1
		In the range within the corresponding device area of S2 and D

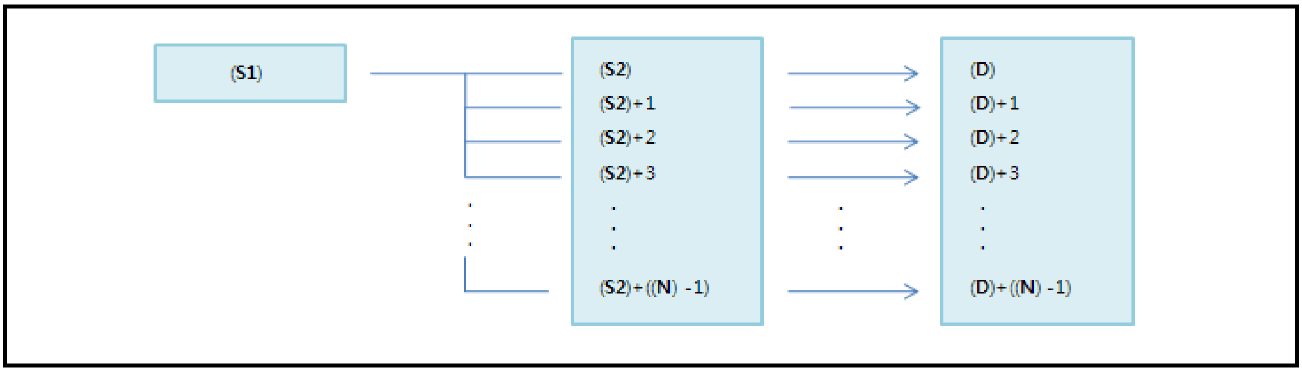
Error	Zero	Carry	Borrow	Step
◎	◎	◎		9

<Ladder>



1. Adds the double word values S1 composed of BCD code and the number of N double word values beginning with S2 also composed of BCD code, respectively, and then stores the result into the number of N destination double words beginning with D double word as BCD code.
2. If any of the value not composed of the BCD code is detected in S1 and S2 error flag is SET.
3. If any of the result value from D and D+N is out of the D range, carry flag is SET.
4. If any of the result value from D and D+N is 0, zero flag is SET.





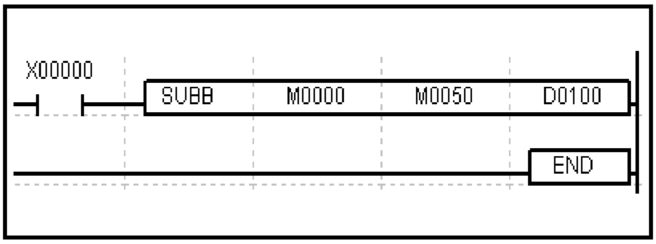
3.2.150 Arithmetic operation instruction(SUBB)

Arithmetic operation instruction	SUBB	S1	S2	D	Applicable model
					LP-S044, LP-S070

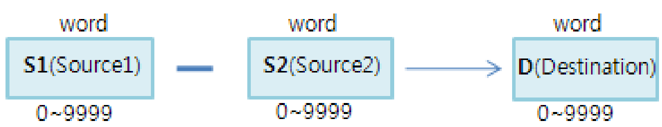
OP	DATA type	Available device / Description / Range
S1	WORD	X, Y, F, Z, T, C, M, S, L, D, UW, integer
		Data address to execute the BCD subtraction operation with S2
		h0000 to h9999
S2	WORD	X, Y, F, Z, T, C, M, S, L, D, UW, integer
		Data address to execute the BCD subtraction operation with S1
		h0000 to h9999
D	WORD	Y, F, Z, T, C, M, S, L, D, UW
		Address to save the operation result
		h0000 to h9999

Error	Zero	Carry	Borrow	Step
◎	◎		◎	7

<Ladder>



1. Subtracts the word value of S2 composed of BCD code from the word value of S1 composed of BCD code, and then stores the result into the destination word D as BCD code.
2. If any of the value not composed of the BCD code is detected in S1 and S2, error flag is SET. (Except 0 to 9999)
3. If the result value is negative number, it is stored as 'h9999'.
4. If the result value is '0', zero flag is SET.



3.2.151 Arithmetic operation instruction(DSUBB)

Arithmetic operation instruction **DSUBB** **S1** **S2** **D**

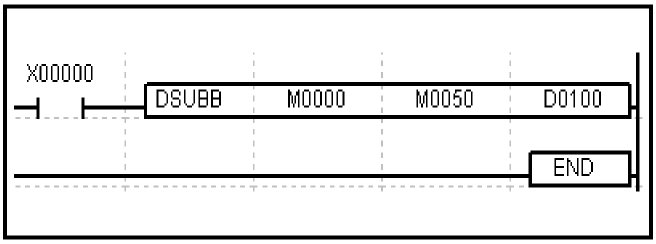
Applicable model

LP-S044, LP-S070

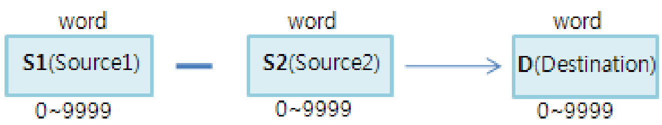
OP	DATA type	Available device / Description / Range
S1	DWORD	X, Y, F, Z, T, C, M, S, L, D, UW, integer
		Data address to execute the BCD subtraction operation with S2
		h00000000 to h99999999
S2	DWORD	X, Y, F, Z, T, C, M, S, L, D, UW, integer
		Data address to execute the BCD subtraction operation with S1
		h00000000 to h99999999
D	DWORD	Y, F, Z, T, C, M, S, L, D, UW
		Address to save the operation result
		h00000000 to h99999999

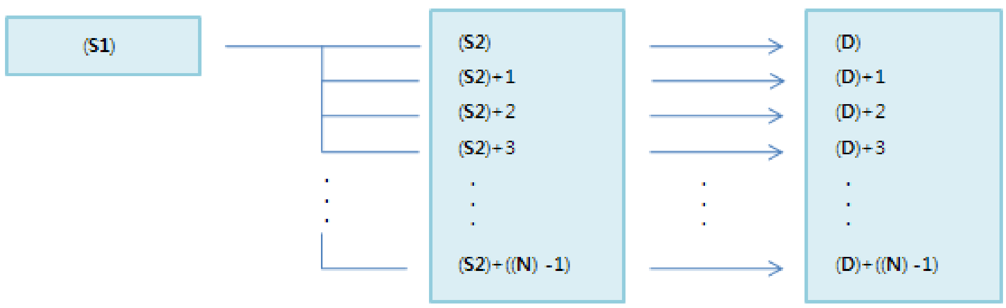
Error	Zero	Carry	Borrow	Step
◎	◎		◎	7

<Ladder>



1. Subtracts the double word value of S2 from double word value of S1, both are composed of BCD code, and then stores the result into the destination double word D as BCD code.
2. If any of the value not composed of the BCD code is detected in S1 and S2, error flag is SET. (Except 0 to 99999999)
3. If the result value is negative number, it is stored as 'h9999'.
4. If the result value is '0', zero flag is SET.





3.2.152 Arithmetic operation instruction(SUBBL)

Arithmetic operation instruction **SUBBL** **S1** **S2** **D** **N**

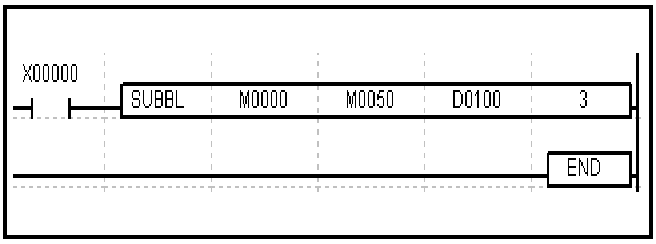
Applicable model

LP-S044, LP-S070

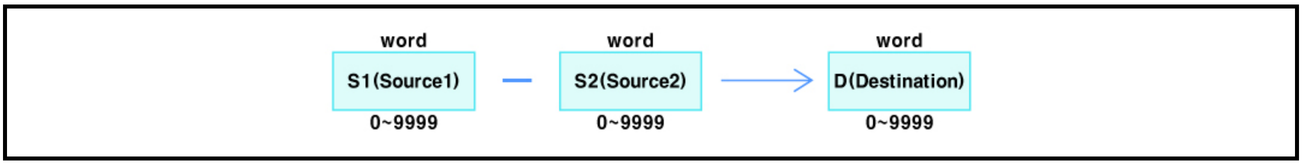
OP	DATA type	Available device / Description / Range
S1	WORD	X, Y, F, Z, T, C, M, S, L, D, UW, integer
		Data address to execute the BCD subtraction operation with S2
		h0000 to h9999
S2	WORD	X, Y, F, Z, T, C, M, S, L, D, UW
		Data address to execute the BCD subtraction operation with S1
		h0000 to h9999
D	WORD	Y, F, Z, T, C, M, S, L, D, UW
		Address to save the operation result
		h0000 to h9999
N	WORD	X, Y, F, Z, T, C, M, S, L, D, UW, integer
		The number of S2 data address and saved address to execute the operation with S1
		In the range within the corresponding device area of S2 and D

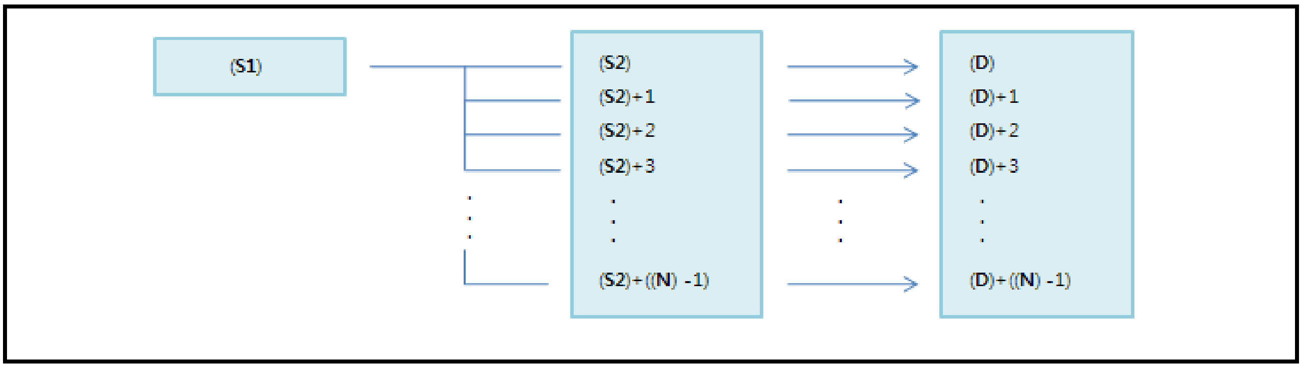
Error	Zero	Carry	Borrow	Step
◎	◎		◎	9

<Ladder>



1. Subtracts the number of N words values composed of BCD code beginning with S2 from word value of S1 composed of BCD code and then stores the result into the number of N destination words beginning with D as BCD code.
2. If any of the value not composed of the BCD code is detected in S1 andf S2, error flag is SET.
3. If any of the result value in the range from D to D+N is negative number in word area, it is stored as 'h9999'.
4. If any of the result value in the range from D to D+N is '0', zero flag is SET.





3.2.153 Arithmetic operation instruction(DSUBBL)

Arithmetic operation instruction **DSUBBL** **S1** **S2** **D** **N**

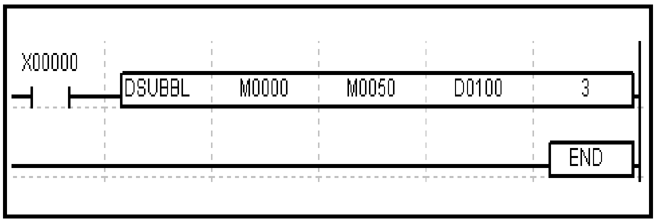
Applicable model

LP-S044, LP-S070

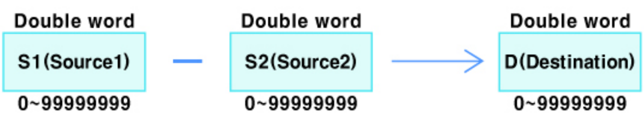
OP	DATA type	Available device / Description / Range
S1	DWORD	X, Y, F, Z, T, C, M, S, L, D, UW, integer
		Data address to execute the BCD subtraction operation with S2
		h00000000 to h99999999
S2	DWORD	X, Y, F, Z, T, C, M, S, L, D, UW
		Data address to execute the BCD subtraction operation with S1
		h00000000 to h99999999
D	DWORD	Y, F, Z, T, C, M, S, L, D, UW
		Address to save the operation result
		h00000000 to h99999999
N	WORD	X, Y, F, Z, T, C, M, S, L, D, UW, integer
		The number of S2 data address and saved address to execute the operation with S1
		In the range within the corresponding device area of S2 and D

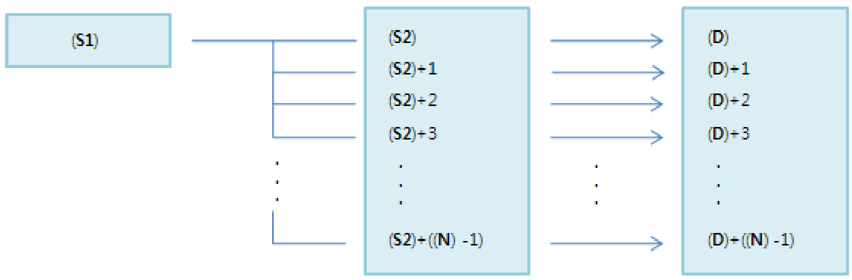
Error	Zero	Carry	Borrow	Step
◎	◎		◎	9

<Ladder>



1. Subtracts the number of N double word values from S2 to S2(N-1), composed of BCD code, from the double word value of S1 composed of BCD code respectively, and then stores the result into the number of N destination double words beginning with D as BCD code.
2. If any of the value not composed of the BCD code is detected in S1 and S2, error flag is SET.
3. If any of the result value in the range from D to D+N is out of the D range, carry flag is SET.
4. If any of the result value in the range from D to D+N is '0', zero flag is SET.





3.2.154 Arithmetic operation instruction(MULB)

Arithmetic operation instruction **MULB** **S1** **S2** **D**

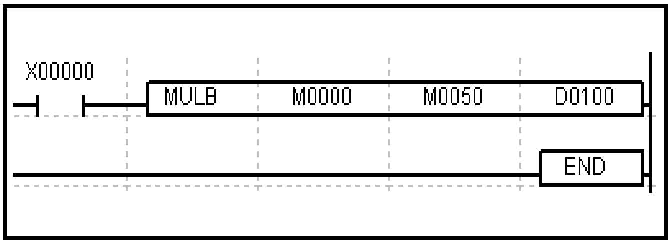
Applicable model

LP-S044, LP-S070

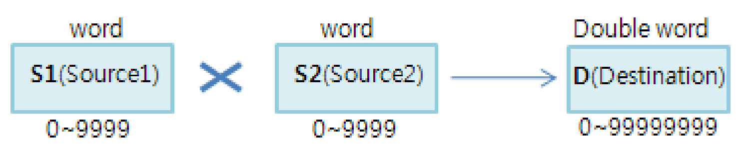
OP	DATA type	Available device / Description / Range
S1	WORD	X, Y, F, Z, T, C, M, S, L, D, UW, integer
		Data address to execute the BCD multiplication with S2
		h0000 to h9999
S2	WORD	X, Y, F, Z, T, C, M, S, L, D, UW, integer
		Data address to execute the BCD multiplication with S1
		h0000 to h9999
D	DWORD	Y, F, Z, T, C, M, S, L, D, UW
		Address to save the operation result
		h00000000 to h99999999

Error	Zero	Carry	Borrow	Step
◎	◎	◎		7

<Ladder>



1. Multiplies the word value of S1 and that of S2, both are composed of BCD code and then stores the result into the destination double word D as BCD code.
2. If any of the value not composed of the BCD code is
detected in S1 and S2, error flag is SET. (Except 0 to 9999)
3. If the result value is out of the D range, carry flag is SET.
4. If the result value is ‘0’, zero flag is SET.



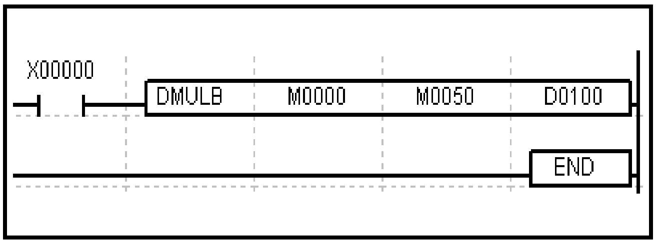
3.2.155 Arithmetic operation instruction(DMULB)

Arithmetic operation instruction	DMULB S1 S2 D	Applicable model LP-S044, LP-S070

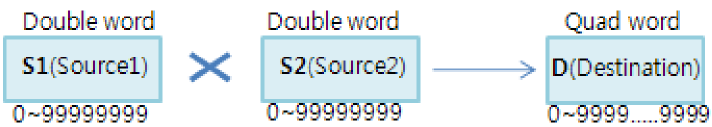
OP	DATA type	Available device / Description / Range
S1	DWORD	X, Y, F, Z, T, C, M, S, L, D, UW, integer
		Data address to execute the BCD multiplication with S2
		h00000000 to h99999999
S2	DWORD	X, Y, F, Z, T, C, M, S, L, D, UW, integer
		Data address to execute the BCD multiplication with S1
		h00000000 to h99999999
D	QWORD	Y, F, Z, T, C, M, S, L, D, UW
		Address to save the operation result

Error	Zero	Carry	Borrow	Step
◎	◎	◎		7

<Ladder>



1. Multiplies the double word value of S1 and that of S2, both are composed of BCD code, and then stores the result into the destination quad word D as BCD code.
2. If any of the value not composed of the BCD code is detected in S1 and S2, error flag is SET.
(Except 0 to 99999999)
3. If the result value is out of the D range, carry flag is SET.
4. If the result value is '0', zero flag is SET.



3.2.156 Arithmetic operation instruction(MULBL)

Arithmetic operation instruction	MULBL	S1	S2	D	N

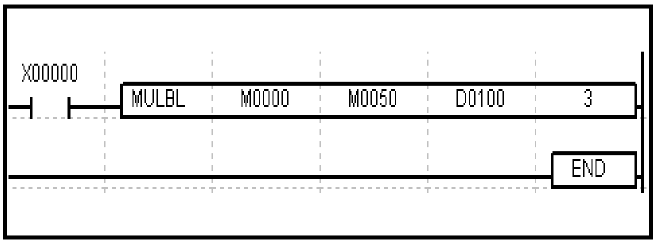
Applicable model

LP-S044, LP-S070

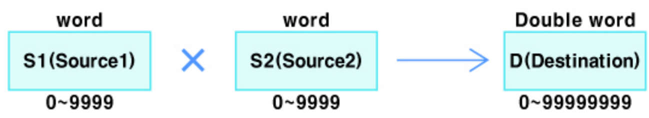
OP	DATA type	Available device / Description / Range
S1	WORD	X, Y, F, Z, T, C, M, S, L, D, UW, integer
		Data address to execute the BCD multiplication with S2
		h0000 to h9999
S2	WORD	X, Y, F, Z, T, C, M, S, L, D, UW
		Data address to execute the BCD multiplication with S1
		h0000 to h9999
D	WORD	Y, F, Z, T, C, M, S, L, D, UW
		Address to save the operation result
		h00000000 to h99999999
N	WORD	X, Y, F, Z, T, C, M, S, L, D, UW, integer
		The number of S2 data address and saved address to execute the operation with S1
		In the range within the corresponding device area of S2 and D

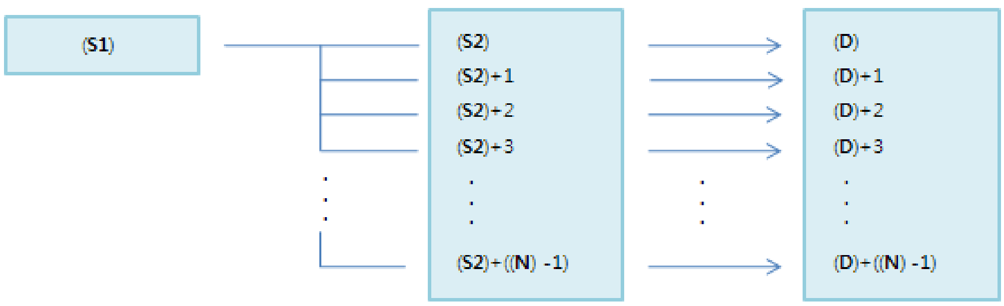
Error	Zero	Carry	Borrow	Step
◎	◎	◎		9

<Ladder>



1. Multiplies the word value of S1 and the number of N word values from S2 to S2(N-1), both are composed of BCD code, one by one, and then stores the result into the number of N destination double words beginning with D as BCD code.
2. If any of the value not composed of the BCD code is detected in S1 and S2, error flag is SET.
3. If any of the result value in the range from D to D+N is out of the D range, carry flag is SET.
4. If any of the result value in the range from D to D+N is ‘0’, zero flag is SET.





3.2.157 Arithmetic operation instruction(DMULBL)

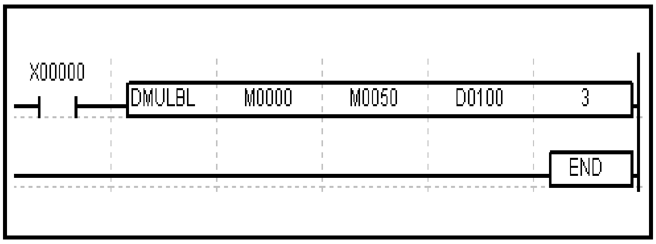
Arithmetic operation instruction **DMULBL S1 S2 D N**

Applicable model: LP-S044, LP-S070

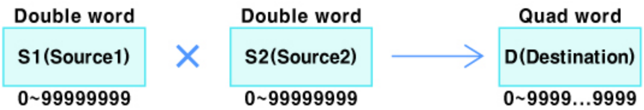
OP	DATA type	Available device / Description / Range
S1	DWORD	X, Y, F, Z, T, C, M, S, L, D, UW, integer
		Data address to execute the BCD multiplication with S2
		h00000000 to h99999999
S2	DWORD	X, Y, F, Z, T, C, M, S, L, D, UW
		Data address to execute the BCD multiplication with S1
		h00000000 to h99999999
D	QWORD	Y, F, Z, T, C, M, S, L, D, UW
		Address to save the operation result
N	WORD	X, Y, F, Z, T, C, M, S, L, D, UW, integer
		The number of S2 data address and saved address to execute the operation with S1
		In the range within the corresponding device area of S2 and D

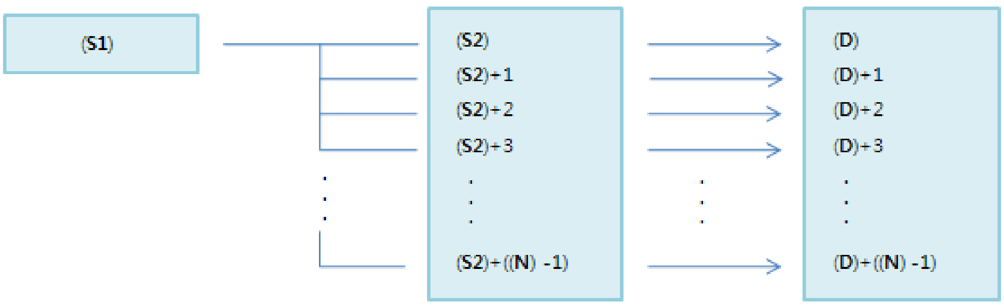
Error	Zero	Carry	Borrow	Step
◎	◎	◎		9

<Ladder>



1. Multiplies the double word value of S1 composed of BCD code and the number of N double words from S2 to S2(N-1) composed of BCD code, one by one, and then stores the result into the number of N destination quad words beginning with D as BCD code.
2. If any of the value not composed of the BCD code is detected in S1 and S2, error flag is SET.
3. If any of the result value in the range from D to D+N is out of the D range, carry flag is SET.
4. If any of the result value in the range from D to D+N is '0', zero flag is SET.





3.2.158 Arithmetic operation instruction(DIVB)

Arithmetic operation instruction	DIVB	S1	S2	D

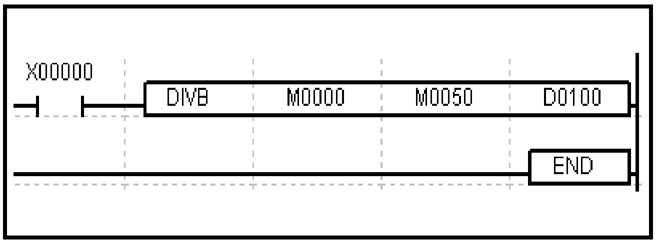
Applicable model

LP-S044, LP-S070

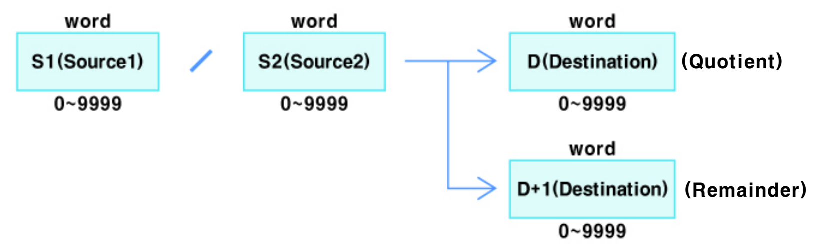
OP	DATA type	Available device / Description / Range
S1	WORD	X, Y, F, Z, T, C, M, S, L, D, UW, integer
		Data address to execute the BCD division operation with S2
		h0000 to h9999
S2	WORD	X, Y, F, Z, T, C, M, S, L, D, UW, integer
		Data address to execute the BCD division operation with S1
		h0000 to h9999
D	WORD	Y, F, Z, T, C, M, S, L, D, UW
		Address to save the operation result
		h0000 to h9999

Error	Zero	Carry	Borrow	Step
◎	◎			7

<Ladder>



1. Divides the word value of S1 composed of BCD code by the word value of S2 composed of BCD code, and then stores the quotient and the remainder into the D and D+1 words respectively.
2. If S2 is 0, or either S1 or S2 is not the BCD code, error flag is SET.
3. If the quotient is ‘0’, zero flag is SET.



3.2.159 Arithmetic operation instruction(DDIVB)

Arithmetic operation instruction	DDIVB	S1	S2	D

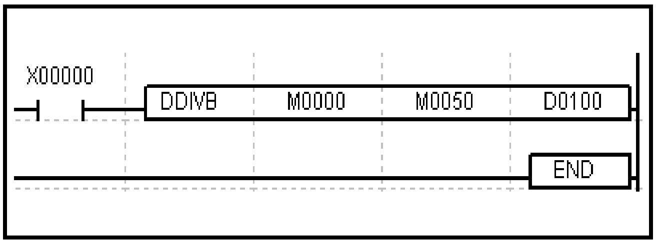
Applicable model

LP-S044, LP-S070

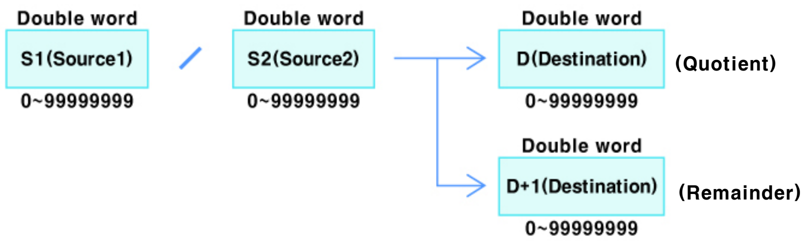
OP	DATA type	Available device / Description / Range
S1	DWORD	X, Y, F, Z, T, C, M, S, L, D, UW, integer
		Data address to execute the BCD division operation with S2
		h00000000 to h99999999
S2	DWORD	X, Y, F, Z, T, C, M, S, L, D, UW, integer
		Data address to execute the BCD division operation with S1
		h00000000 to h99999999
D	DWORD	Y, F, Z, T, C, M, S, L, D, UW
		Address to save the operation result
		h00000000 to h99999999

Error	Zero	Carry	Borrow	Step
◎	◎			7

<Ladder>



1. Divides the double word value of S1 composed of BCD code by the double word value of S2 composed of BCD code, and then stores the quotient and the remainder into the D and D+1 double words respectively.
2. If S2 is 0, or either S1 or S2 is not the BCD code,error flag is SET.
3. If the quotient is ‘0’, zero flag is SET.



3.2.160 Arithmetic operation instruction(DIVBL)

Arithmetic operation instruction	DIVBL	S1	S2	D	N

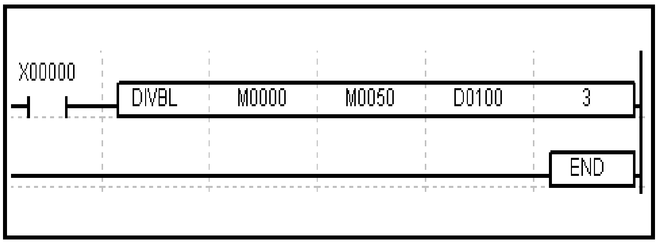
Applicable model

LP-S044, LP-S070

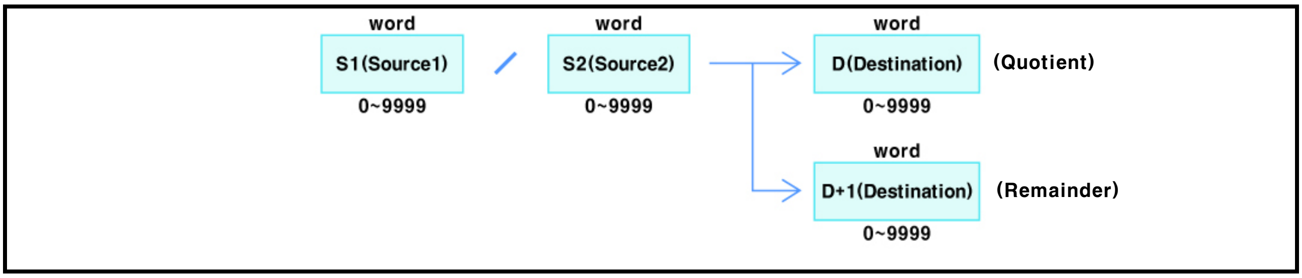
OP	DATA type	Available device / Description / Range
S1	WORD	X, Y, F, Z, T, C, M, S, L, D, UW, integer
		Data address to execute the BCD division operation with S2
		h0000 to h9999
S2	WORD	X, Y, F, Z, T, C, M, S, L, D, UW
		Data address to execute the BCD division operation with S1
		h0000 to h9999
D	WORD	Y, F, Z, T, C, M, S, L, D, UW
		Address to save the operation result
		h0000 to h9999
N	WORD	X, Y, F, Z, T, C, M, S, L, D, UW, integer
		The number of S2 data address and saved address to execute the operation with S1
		In the range within the corresponding device area of S2 and D

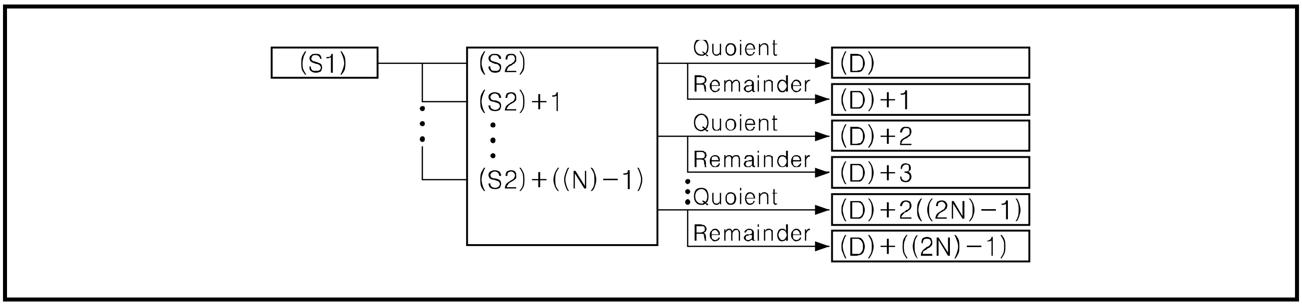
Error	Zero	Carry	Borrow	Step
◎	◎			9

<Ladder>



1. Divides the word value of S1 composed of BCD code by the number of N word values from S2 to S2(N-1) composed of BCD code, and then stores the quotient and the remainder into the D and D+1 double words respectively.
2. If S2 is 0, or either S1 or S2 is not the BCD code,error flag is SET.
3. If the quotient is '0', zero flag is SET.





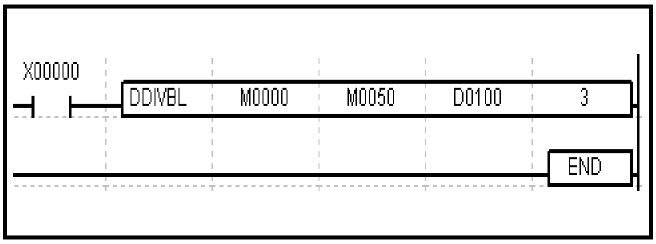
3.2.161 Arithmetic operation instruction(DDIVBL)

Arithmetic operation instruction	DDIVBL	S1	S2	D	N	Applicable model
						LP-S044, LP-S070

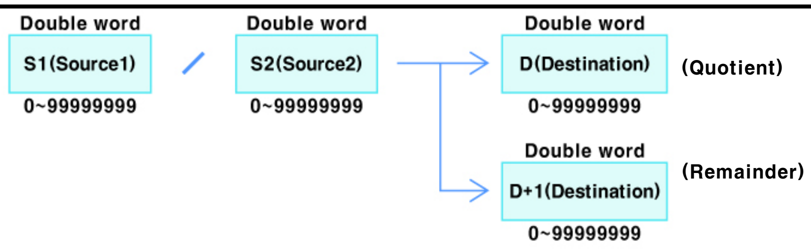
OP	DATA type	Available device / Description / Range
S1	DWORD	X, Y, F, Z, T, C, M, S, L, D, UW, integer
		Data address to execute the BCD division operation with S2
		h00000000 to h99999999
S2	DWORD	X, Y, F, Z, T, C, M, S, L, D, UW
		Data address to execute the BCD division operation with S1
		h00000000 to h99999999
D	DWORD	Y, F, Z, T, C, M, S, L, D, UW
		Address to save the operation result
		h00000000 to h99999999
N	WORD	X, Y, F, Z, T, C, M, S, L, D, UW, integer
		The number of S2 data address and saved address to execute the operation with S1
		In the range within the corresponding device area of S2 and D

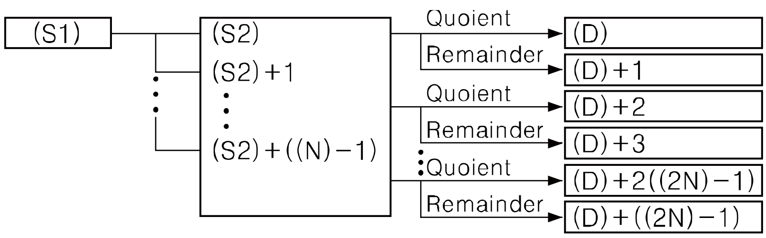
Error	Zero	Carry	Borrow	Step
◎	◎			9

<Ladder>



1. Divides the double word value of S1 composed of BCD code by the number of N double word values from S2 to S2(N-1), composed of BCD code, and then stores the quotient and the remainder into the D and D+1 double words respectively.
2. If S2 is 0, or either S1 or S2 is not the BCD code, error flag is SET.
3. If the quotient is '0', zero flag is SET.





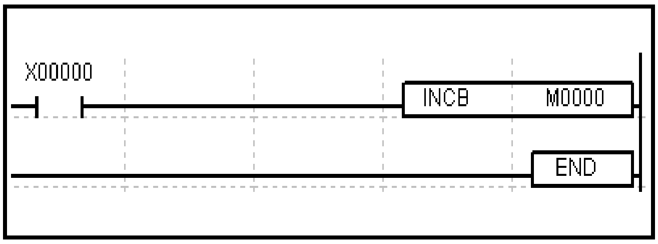
3.2.162 Arithmetic operation instruction(INCB)

Arithmetic operation instruction	INCB	D	Applicable model
			LP-S044, LP-S070

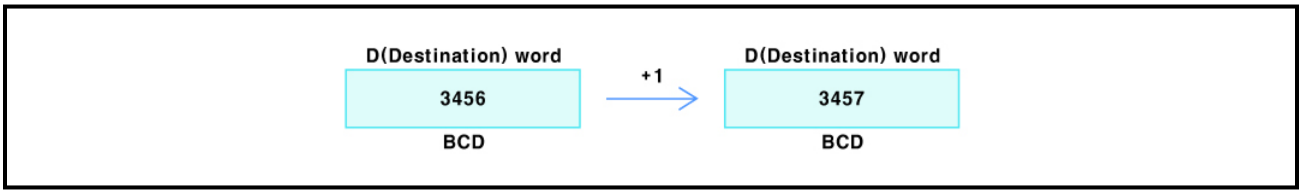
OP	DATA type	Available device / Description / Range
D	WORD	Y, F, Z, T, C, M, S, L, D, UW
		BCD data address to execute the operation
		h0000 to h9999

Error	Zero	Carry	Borrow	Step
◎	◎	◎		3

<Ladder>



1. Increases the word value of D composed of BCD code by 1 as BCD code.
2. If the word value of D is not the BCD code, error flag is SET.
3. If the increased result is 0(BCD), zero flag is SET.
4. If the result value is out of the D word range, carry flag is SET.



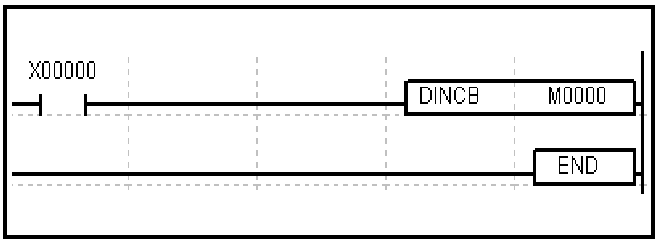
3.2.163 Arithmetic operation instruction(DINCB)

Arithmetic operation instruction	DINCB	D	Applicable model
			LP-S044, LP-S070

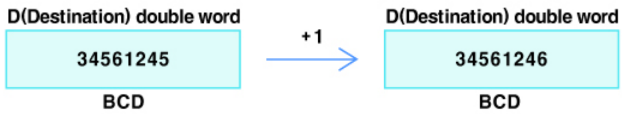
OP	DATA type	Available device / Description / Range
D	DWORD	Y, F, Z, T, C, M, S, L, D, UW
		BCD data address to execute the operation
		h00000000 to h99999999

Error	Zero	Carry	Borrow	Step
◎	◎	◎		3

<Ladder>



1. Increases the double word value of D composed of BCD code by 1 as BCD code.
2. If the double word value of D is not the BCD code, error flag is SET.
3. If the increased result is 0(BCD), zero flag is SET.
4. If the result value is out of the D double word range, carry flag is SET.

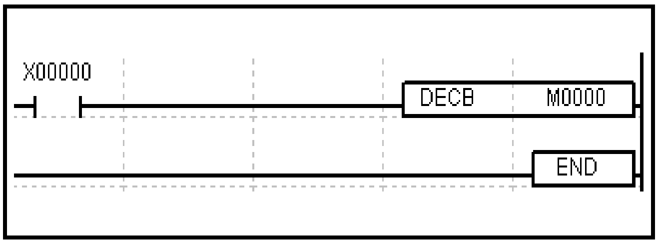


3.2.164 Arithmetic operation instruction(DECB)

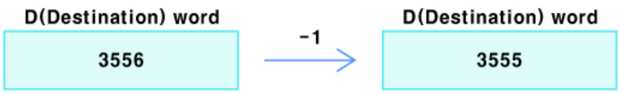
Arithmetic operation instruction	DECB	D	Applicable model
			LP-S044, LP-S070

OP	DATA type	Available device / Description / Range	Error	Zero	Carry	Borrow	Step
D	WORD	Y, F, Z, T, C, M, S, L, D, UW	◎	◎		◎	3
		BCD data address to execute the operation					
		h0000 to h9999					

<Ladder>



1. Decreases the word value of D composed of BCD code by 1 as BCD code.
2. If the word value of D is not the BCD code, error flag is SET.
3. If the decreased result is 0(BCD), zero flag is SET.
4. If the result value is out of D word range, borrow flag is SET.



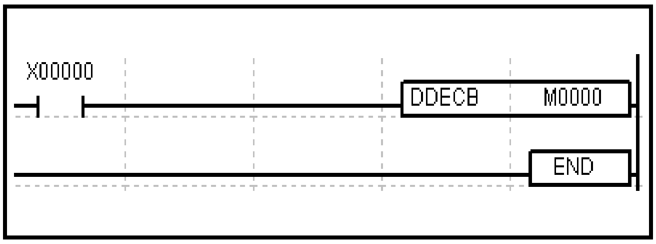
3.2.165 Arithmetic operation instruction(DDECB)

Arithmetic operation instruction	DDECB	D		Applicable model
				LP-S044, LP-S070

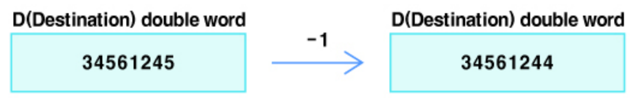
OP	DATA type	Available device / Description / Range
D	DWORD	Y, F, Z, T, C, M, S, L, D, UW
		BCD data address to execute the operation
		h00000000 to h99999999

Error	Zero	Carry	Borrow	Step
◎	◎		◎	3

<Ladder>



1. Decreases the double word of D composed of BCD code by 1 as BCD code.
2. If the double word value of D is not BCD code, error flag is SET.
3. If the decreased result is 0(BCD), zero flag is SET.
4. If the result value is out of the D double word range, borrow flag is SET.



3.2.166 Logical operation instruction(WAND)

Logical operation instruction	WAND	S1	S2	D

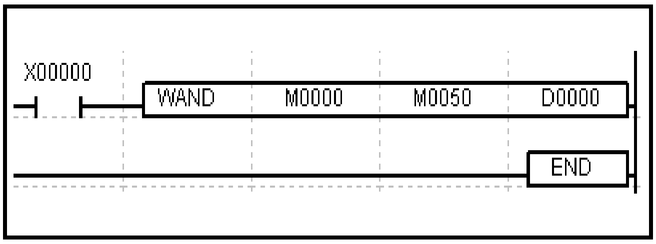
Applicable model

LP-S044, LP-S070

OP	DATA type	Available device / Description / Range
S1	WORD	X, Y, F, Z, T, C, M, S, L, D, UW, integer
		Data address to execute the '&' operation with S2
		0(h0000) to 65535(hFFFF)
S2	WORD	X, Y, F, Z, T, C, M, S, L, D, UW, integer
		Data address to execute the '&' operation with S1
		0(h0000) to 65535(hFFFF)
D	WORD	Y, F, Z, T, C, M, S, L, D, UW
		Address to save the operation result
		0(h0000) to 65535(hFFFF)

Error	Zero	Carry	Borrow	Step
	◎			7

<Ladder>



1. Executes the '&' operation for every bit of S1 word and the corresponding bit of S2 word and then stores the result into the D word.
2. If the result value is '0', zero flag is SET.

	B15															B0
(S1)	1	0	1	1	0	0	1	1	1	1	0	0	0	1	0	1

&

	B15															B0
(S2)	1	1	0	0	0	0	0	1	1	1	1	0	1	1	0	0

||

	B15															B0
(D)	1	0	0	0	0	0	0	1	1	1	0	0	0	1	0	0

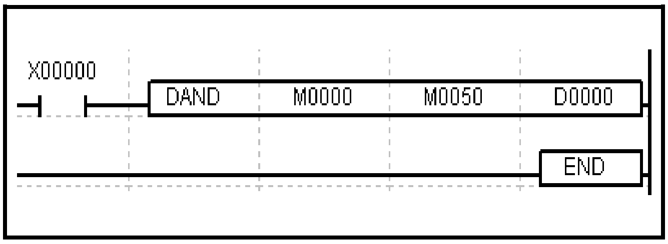
3.2.167 Logical operation instruction(DAND)

Logical operation instruction	DAND	S1	S2	D	Applicable model
					LP-S044, LP-S070

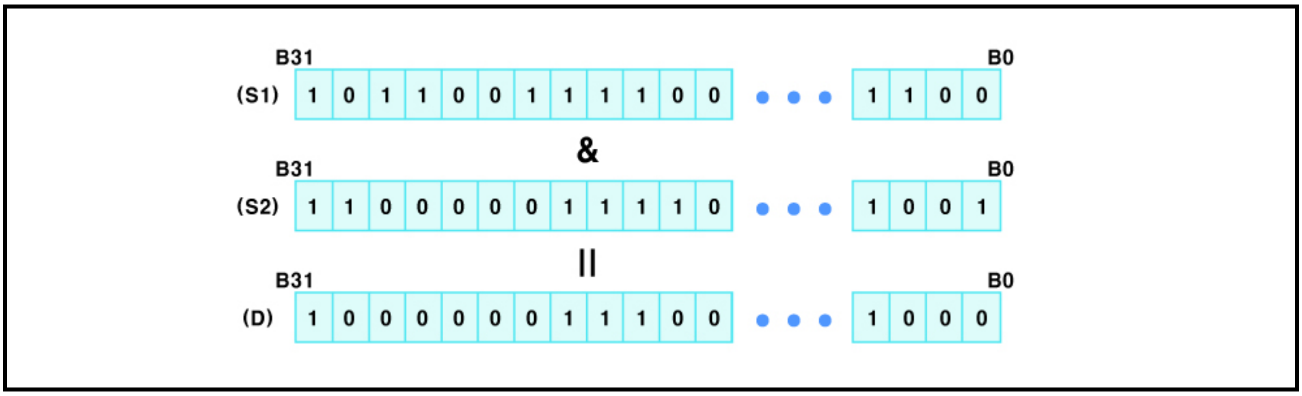
OP	DATA type	Available device / Description / Range
S1	DWORD	X, Y, F, Z, T, C, M, S, L, D, UW, integer
		Data address to execute the '&' operation with S2
		0(h0000) to 4294967295(hFFFFFFFF)
S2	DWORD	X, Y, F, Z, T, C, M, S, L, D, UW, integer
		Data address to execute the '&' operation with S1
		0(h0000) to 4294967295(hFFFFFFFF)
D	DWORD	Y, F, Z, T, C, M, S, L, D, UW
		Address to save the operation result
		0(h0000) to 4294967295(hFFFFFFFF)

Error	Zero	Carry	Borrow	Step
	◎			7

<Ladder>



1. Executes the '&' operation for every bit of S1 double word and the corresponding bit of S2 double word and then stores the result into the D double word.
2. If the result value is '0', zero flag is SET.



3.2.168 Logical operation instruction(AAND)

Logical operation instruction	AAND	S1	S2	D	N

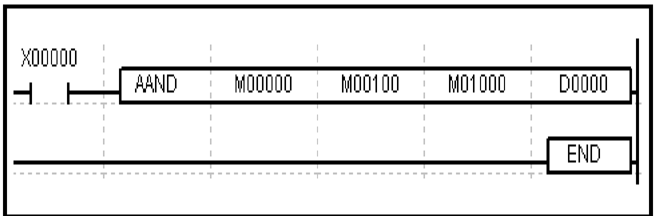
Applicable model

LP-S044, LP-S070

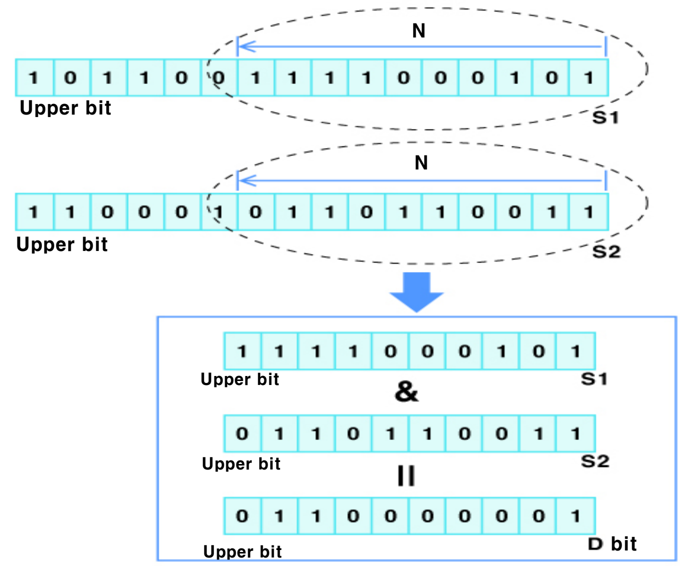
OP	DATA type	Available device / Description / Range
S1	BIT	X, Y, F, T, C, M, UB
		Start address of the bit device to execute the ‘&’ operation with S2
		Not applicable
S2	BIT	X, Y, F, T, C, M, UB
		Start address of the bit device to execute the '&' operation with S1
		Not applicable
D	BIT	Y, F, T, C, M, UB
		Start address of the bit device to store the operation result
		Not applicable
N	WORD	X, Y, F, Z, T, C, M, S, L, D, UW, integer
		The number of bit device to execute the operation including the start address
		As many as the number of devices remained in the corresponding S1, S2, and D area

Error	Zero	Carry	Borrow	Step
	◎			9

<Ladder>



Executes the ‘&’ operation for the number of N bits, from S1 to SN, and the number of N bits, from S2 to S2(N-1), and then stores the result into the number of N bits beginning with D.



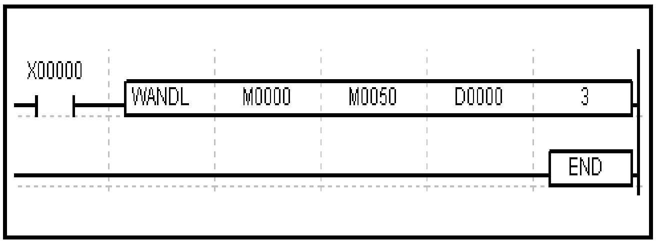
3.2.169 Logical operation instruction(WANDL)

Logical operation instruction	WANDL	S1	S2	D	N	Applicable model
						LP-S044, LP-S070

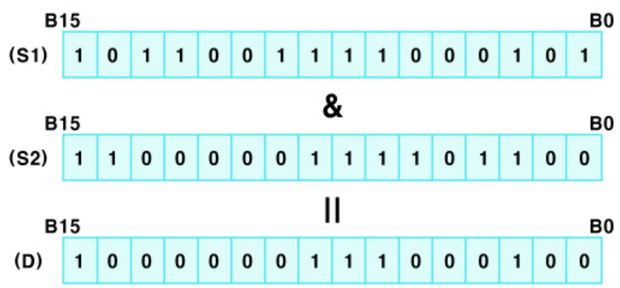
OP	DATA type	Available device / Description / Range
S1	WORD	X, Y, F, Z, T, C, M, S, L, D, UW, integer
		Data address to execute the '&' operation with S2
		0(h0000) to 65535(hFFFF)
S2	WORD	X, Y, F, Z, T, C, M, S, L, D, UW
		Data address to execute the '&' operation with S1
		0(h0000) to 65535(hFFFF)
D	WORD	Y, F, Z, T, C, M, S, L, D, UW
		Address to save the operation result
		0(h0000) to 65535(hFFFF)
N	WORD	X, Y, F, Z, T, C, M, S, L, D, UW, integer
		The number of S2 data address and saved address to execute the operation with S1
		In the range within the corresponding device area of S2 and D

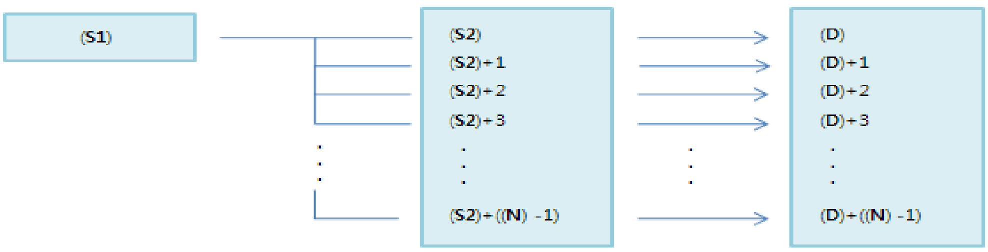
Error	Zero	Carry	Borrow	Step
	◎			9

<Ladder>



1. Executes the bitwise '&' operation for every bit of S1 word and the number of N words from S2 to S2(N-1) and then stores the result into the number of N words beginning with D.
2. If the result value is '0' word, zero flag is SET.





3.2.170 Logical operation instruction(DANDL)

Logical operation instruction	DANDL	S1	S2	D	N

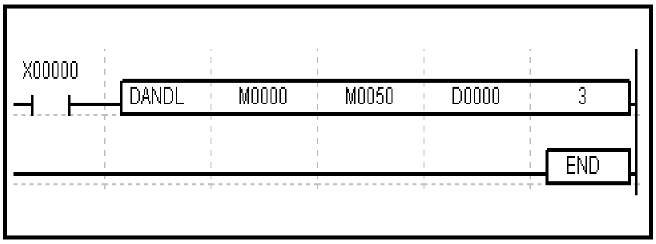
Applicable model

LP-S044, LP-S070

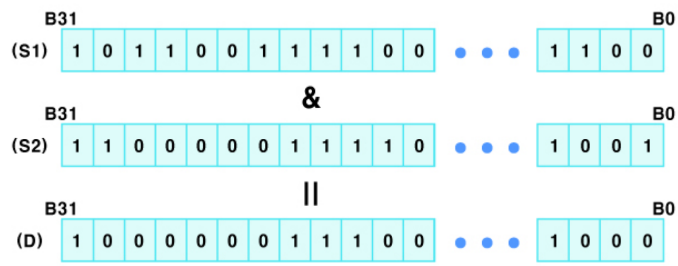
OP	DATA type	Available device / Description / Range
S1	DWORD	X, Y, F, Z, T, C, M, S, L, D, UW, integer
		Data address to execute the '&' operation with S2
		0(h0000) to 4294967295(hFFFFFFFF)
S2	DWORD	X, Y, F, Z, T, C, M, S, L, D, UW
		Data address to execute the '&' operation with S1
		0(h0000) to 4294967295(hFFFFFFFF)
D	DWORD	Y, F, Z, T, C, M, S, L, D, UW
		Address to save the operation result
		0(h0000) to 4294967295(hFFFFFFFF)
N	WORD	X, Y, F, Z, T, C, M, S, L, D, UW, integer
		The number of S2 data address and saved address to execute the operation with S1
		In the range within the corresponding device area of S2 and D

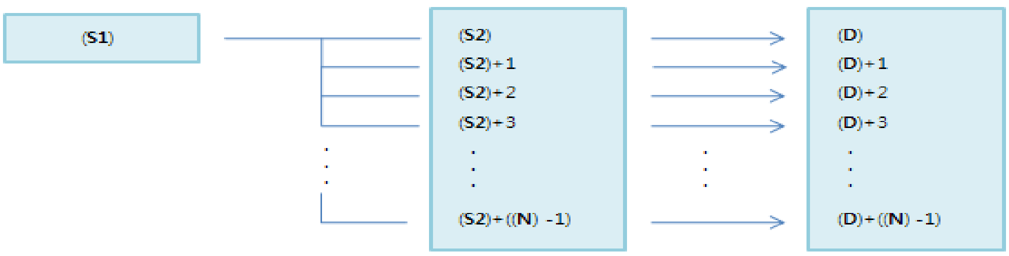
Error	Zero	Carry	Borrow	Step
	◎			9

<Ladder>



1. Executes the bitwise '&' operation for every bit of S1 double words and the number of N words from S2 to S2(N-1) and then stores the result into the number of N words beginning with D.
2. If the result value is '0' double word, zero flag is SET.





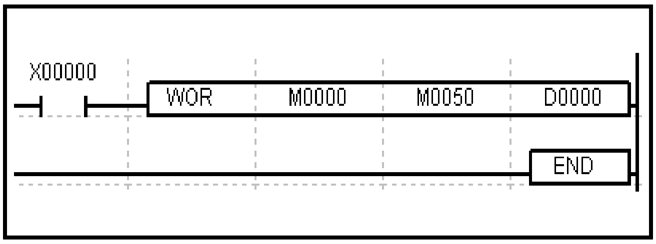
3.2.171 Logical operation instruction(WOR)

Logical operation instruction	WOR	S1	S2	D	Applicable model
					LP-S044, LP-S070

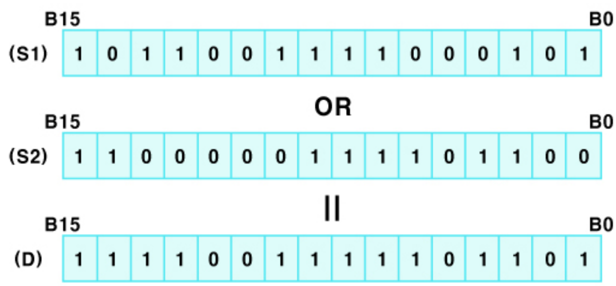
OP	DATA type	Available device / Description / Range
S1	WORD	X, Y, F, Z, T, C, M, S, L, D, UW, integer
		Data address to execute the ‘OR’ operation with S2
		0(h0000) to 65535(hFFFF)
S2	WORD	X, Y, F, Z, T, C, M, S, L, D, UW, integer
		Data address to execute the ‘OR’ operation with S1
		0(h0000) to 65535(hFFFF)
D	WORD	Y, F, Z, T, C, M, S, L, D, UW
		Address to save the operation result
		0(h0000) to 65535(hFFFF)

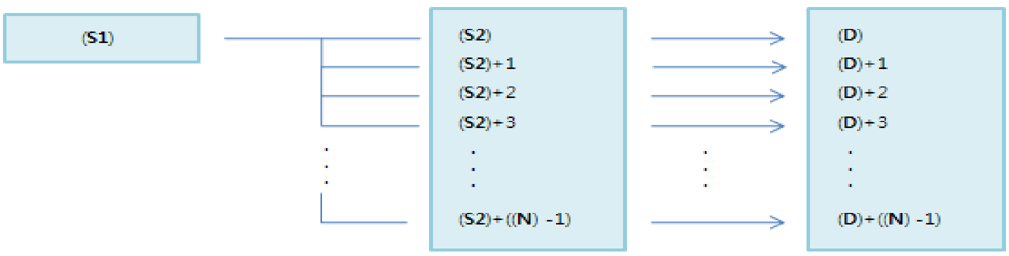
Error	Zero	Carry	Borrow	Step
	◎			7

<Ladder>



1. Executes the logical ‘OR’ operation for every bit in S1 words and the corresponding bit of S2 words, and then stores the result into the D word.
2. If the result value is ‘0’, zero flag is SET.





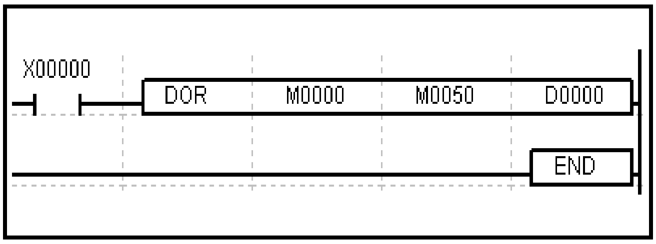
3.2.172 Logical operation instruction(DOR)

Logical operation instruction	DOR	S1	S2	D	Applicable model
					LP-S044, LP-S070

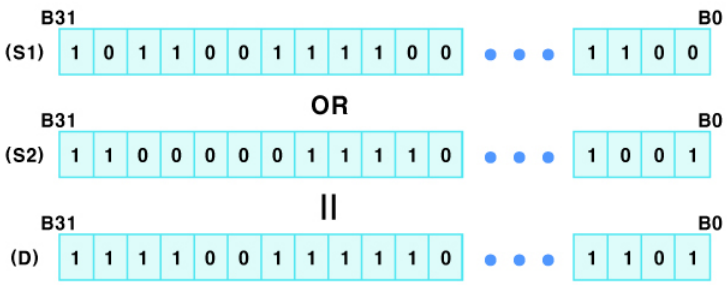
OP	DATA type	Available device / Description / Range
S1	DWORD	X, Y, F, Z, T, C, M, S, L, D, UW, integer
		Data address to execute the 'OR' operation with S2
		0(h0000) to 4294967295(hFFFFFFFF)
S2	DWORD	X, Y, F, Z, T, C, M, S, L, D, UW, integer
		Data address to execute the 'OR' operation with S1
		0(h0000) to 4294967295(hFFFFFFFF)
D	DWORD	Y, F, Z, T, C, M, S, L, D, UW
		Address to save the operation result
		0(h0000) to 4294967295(hFFFFFFFF)

Error	Zero	Carry	Borrow	Step
	◎			5

<Ladder>



1. Executes the logical 'OR' operation for every bit of S1 double words and the corresponding bit of S2 double words, and then stores the result into the D double word.
2. If the result value is '0', zero flag is SET.



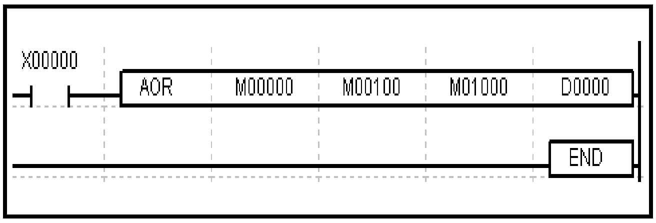
3.2.173 Logical operation instruction(AOR)

Logical operation instruction	AOR	S1	S2	D	N	Applicable model
						LP-S044, LP-S070

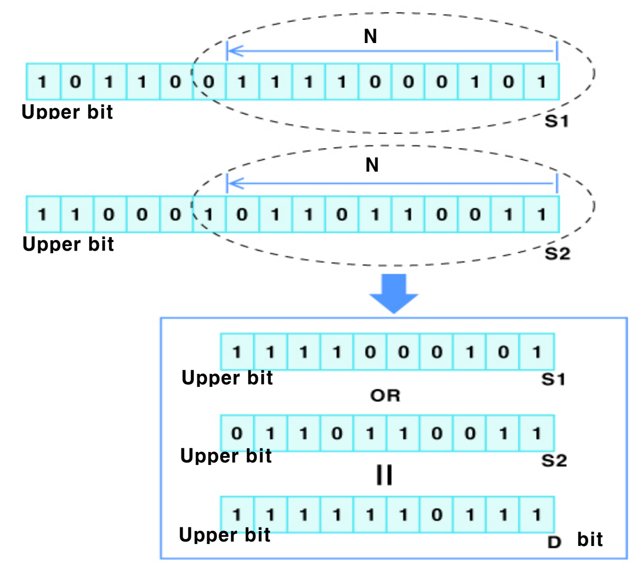
OP	DATA type	Available device / Description / Range
S1	BIT	X, Y, F, T, C, M, UB
		Data address to execute the 'OR' operation with S2
		Not applicable
S2	BIT	X, Y, F, T, C, M, UB
		Data address to execute the 'OR' operation with S1
		Not applicable
D	BIT	Y, F, T, C, M, UB
		Start address of the bit device to save the operation result
		Not applicable
N	WORD	X, Y, F, Z, T, C, M, S, L, D, UW, integer
		The number of bit devices to execute the operation including the start address
		As many as the number of devices remained in the corresponding S1, S2, and D area

Error	Zero	Carry	Borrow	Step
	◎			9

<Ladder>



Executes the logical 'OR' operation for the number of N bits from S1 to SN and the number of N bits from S2 to S2(N- 1), and then stores the result into the the number of N bits beginning with D.



3.2.174 Logical operation instruction(WORL)

Logical operation instruction	WORL	S1	S2	D	N

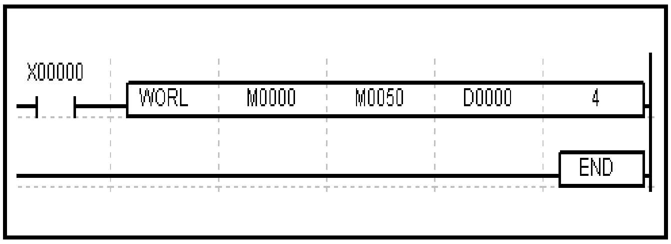
Applicable model

LP-S044, LP-S070

OP	DATA type	Available device / Description / Range
S1	WORD	X, Y, F, Z, T, C, M, S, L, D, UW, integer
		Data address to execute the 'OR' operation with S2
		0(h0000) to 65535(hFFFF)
S2	WORD	X, Y, F, Z, T, C, M, S, L, D, UW
		Data address to execute the 'OR' operation with S1
		0(h0000) to 65535(hFFFF)
D	WORD	Y, F, Z, T, C, M, S, L, D, UW
		Address to save the operation result
		0(h0000) to 65535(hFFFF)
N	WORD	X, Y, F, Z, T, C, M, S, L, D, UW, integer
		The number of S2 data address and saved address to execute the operation with S1
		In the range within the corresponding device area of S2 and D

Error	Zero	Carry	Borrow	Step
	◎			9

<Ladder>



1. Executes the bitwise logical 'OR' operation for every bit of S1 words and the number of N words from S2 to S2(N-1), and then stores the result into the D word.
2. If the result value is '0' word, zero flag is SET.

	B15															B0
(S1)	1	0	1	1	0	0	1	1	1	1	0	0	0	1	0	1

OR

	B15															B0
(S2)	1	1	0	0	0	0	0	1	1	1	1	0	1	1	0	0

||

	B15															B0
(D)	1	1	1	1	0	0	1	1	1	1	1	0	1	1	0	1

3.2.175 Logical operation instruction(DORL)

Logical operation instruction **DORL** **S1** **S2** **D** **N**

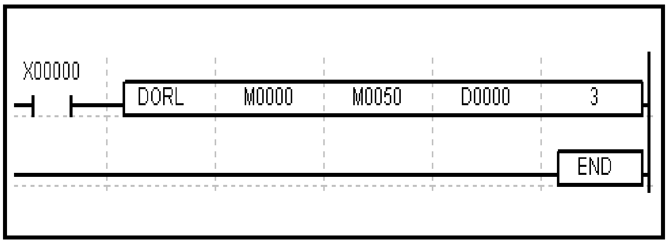
Applicable model

LP-S044, LP-S070

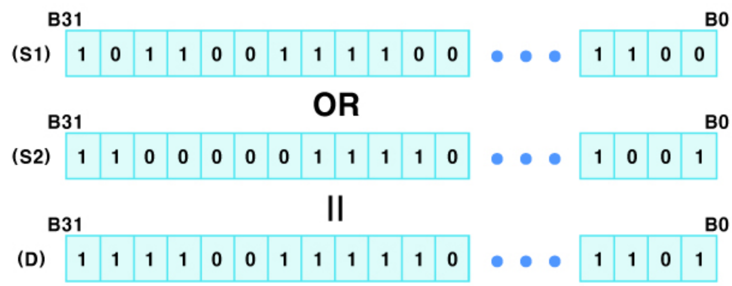
OP	DATA type	Available device / Description / Range
S1	DWORD	X, Y, F, Z, T, C, M, S, L, D, UW, integer
		Data address to execute the ‘OR’ operation with S2
		0(h0000) to 4294967295(hFFFFFFFF)
S2	DWORD	X, Y, F, Z, T, C, M, S, L, D, UW
		Data address to execute the ‘OR’ operation with S1
		0(h0000) to 4294967295(hFFFFFFFF)
D	DWORD	Y, F, Z, T, C, M, S, L, D, UW
		Address to save the operation result
		0(h0000) to 4294967295(hFFFFFFFF)
N	WORD	X, Y, F, Z, T, C, M, S, L, D, UW, integer
		The number of S2 data address and saved address to execute the operation with S1
		In the range within the corresponding device area of S2 and D

Error	Zero	Carry	Borrow	Step
	◎			9

<Ladder>



1. Executes the bitwise logical ‘OR’ operation for every bit of S1 double word and the number of N double words from S2 to S2(N-1) respectively and then stores the result into the number of N double words beginning with D double word.
2. If the result value is ‘0’ double word, zero flag is SET.



3.2.176 Logical operation instruction(XOR)

Logical operation instruction	XOR	S1	S2	D

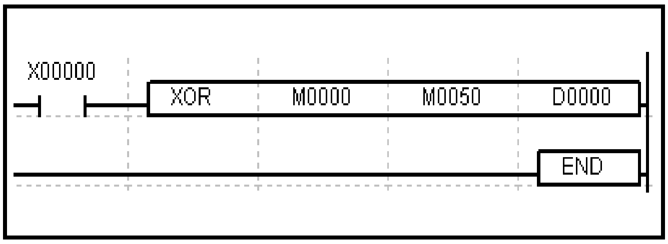
Applicable model

LP-S044, LP-S070

OP	DATA type	Available device / Description / Range
S1	WORD	X, Y, F, Z, T, C, M, S, L, D, UW, integer
		Data address to execute the 'XOR' operation with S2
		0(h0000) to 65535(hFFFF)
S2	WORD	X, Y, F, Z, T, C, M, S, L, D, UW, integer
		Data address to execute the 'XOR' operation with S1
		0(h0000) to 65535(hFFFF)
D	WORD	Y, F, Z, T, C, M, S, L, D, UW
		Address to save the operation result
		0(h0000) to 65535(hFFFF)

Error	Zero	Carry	Borrow	Step
	◎			7

<Ladder>



1. Executes the logical 'XOR' operation for every bit of S1 word and the corresponding bit of S2 word and then stores the result into the D word.
2. If the result value is '0', zero flag is SET.

	B15															B0
(S1)	1	0	1	1	0	0	1	1	1	1	0	0	0	1	0	1

XOR

	B15															B0
(S2)	1	1	0	0	0	0	0	1	1	1	1	0	1	1	0	0

||

	B15															B0
(D)	0	1	1	1	0	0	1	0	0	0	1	0	1	0	0	1

3.2.177 Logical operation instruction(DXOR)

Logical operation instruction **DXOR** **S1** **S2** **D**

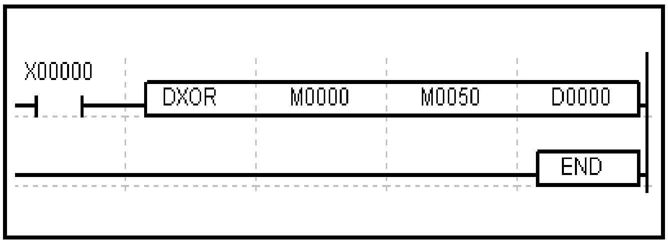
Applicable model

LP-S044, LP-S070

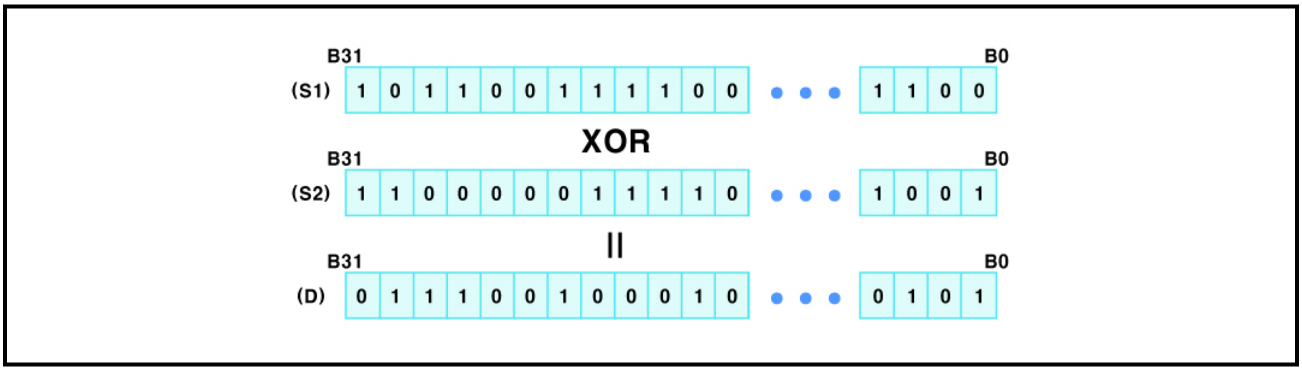
OP	DATA type	Available device / Description / Range
S1	DWORD	X, Y, F, Z, T, C, M, S, L, D, UW, integer
		Data address to execute the 'XOR' operation with S2
		0(h0000) to 4294967295(hFFFFFFFF)
S2	DWORD	X, Y, F, Z, T, C, M, S, L, D, UW, integer
		Data address to execute the 'XOR' operation with S1
		0(h0000) to 4294967295(hFFFFFFFF)
D	DWORD	Y, F, Z, T, C, M, S, L, D, UW
		Address to save the operation result
		0(h0000) to 4294967295(hFFFFFFFF)

Error	Zero	Carry	Borrow	Step
	◎			7

<Ladder>



1. Executes the logical 'XOR' operation for every bit of S1 double word and the corresponding bit of S2 double word and then stores the result into the D double word.
2. If the result value is '0', zero flag is SET.



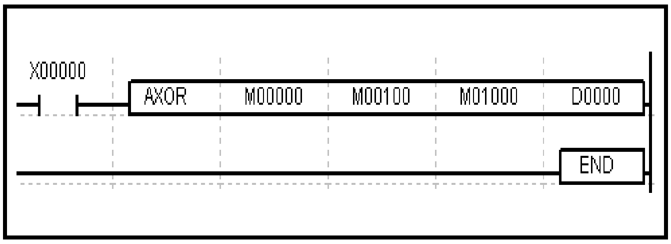
3.2.178 Logical operation instruction(AXOR)

Logical operation instruction	AXOR	S1	S2	D	N	Applicable model
						LP-S044, LP-S070

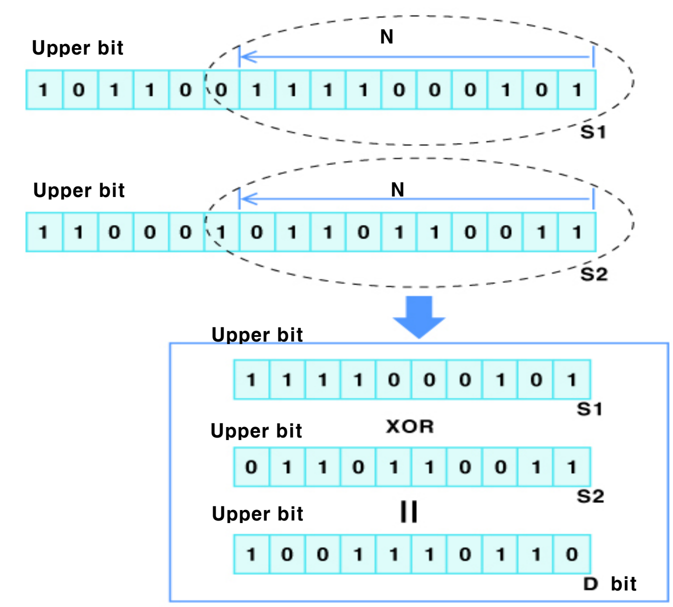
OP	DATA type	Available device / Description / Range
S1	BIT	X, Y, F, T, C, M, UB
		Start address of the bit device to execute the 'XOR' operation with S2
		Not applicable
S2	BIT	X, Y, F, T, C, M, UB
		Start address of the bit device to execute the 'XOR' operation with S1
		Not applicable
D	BIT	Y, F, T, C, M, UB
		Address to save the operation result
		Not applicable
N	WORD	X, Y, F, Z, T, C, M, S, L, D, UW, integer
		The number of bit devices including the start address to execute the operation
		As many as the number of devices remained in S1, S2 and D area

Error	Zero	Carry	Borrow	Step
	◎			9

<Ladder>



Executes the logical 'XOR' operation for the number of N bits from S1 to SN and the number of N bits from S2 to S2(N-1), bit by bit, and then stores the result into the number of N bits beginning with D destination bit.



3.2.179 Logical operation instruction(XORL)

Logical operation instruction **XORL** **S1** **S2** **D** **N**

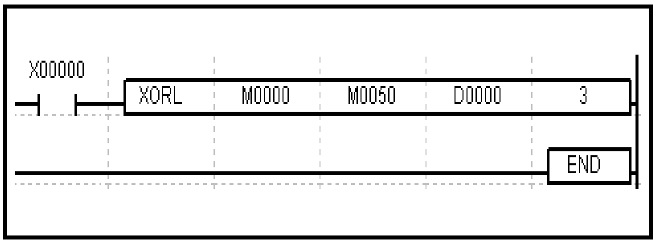
Applicable model

LP-S044, LP-S070

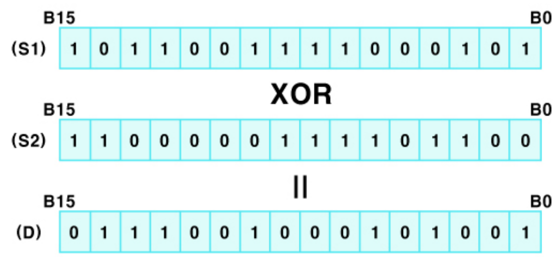
OP	DATA type	Available device / Description / Range
S1	WORD	X, Y, F, Z, T, C, M, S, L, D, UW, integer
		Data address to execute the ‘XOR’ operation with S2
		0(h0000) to 65535(hFFFF)
S2	WORD	X, Y, F, Z, T, C, M, S, L, D, UW
		Data address to execute the ‘XOR’ operation with S1
		0(h0000) to 65535(hFFFF)
D	WORD	Y, F, Z, T, C, M, S, L, D, UW
		Address to save the operation result
		0(h0000) to 65535(hFFFF)
N	WORD	X, Y, F, Z, T, C, M, S, L, D, UW, integer
		The number of S2 data address and saved address to execute the operation with S1
		In the range within the corresponding device area of S2 and D

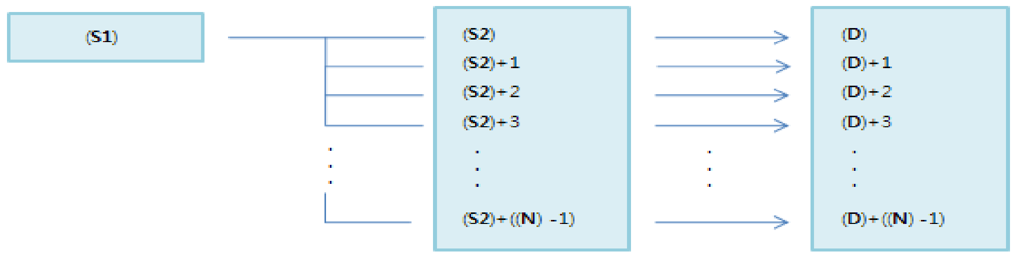
Error	Zero	Carry	Borrow	Step
	◎			9

<Ladder>



1. Executes the bitwise logical ‘XOR’ operation for every bit of S1 word and the number of N words, from S2 to S2(N-1), then stores the result into the number of N words beginning with D.
2. If the result value is ‘0’ word, zero flag is SET.





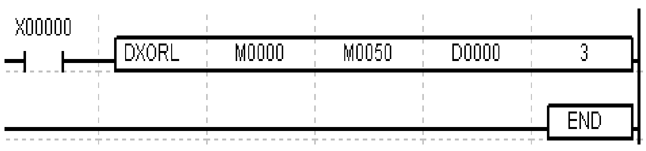
3.2.180 Logical operation instruction(DXORL)

Logical operation instruction	DXORL	S1	S2	D	N	Applicable model
						LP-S044, LP-S070

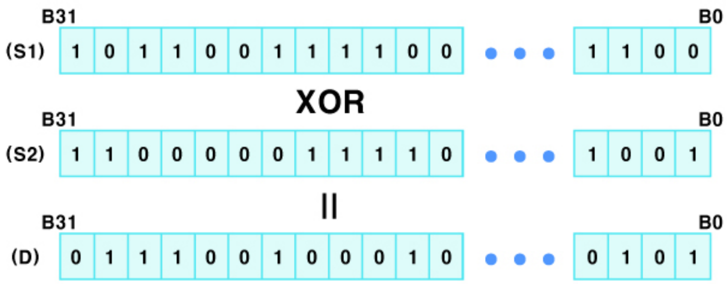
OP	DATA type	Available device / Description / Range
S1	DWORD	X, Y, F, Z, T, C, M, S, L, D, UW, integer
		Data address to execute the 'XOR' operation with S2
		0(h0000) to 4294967295(hFFFFFFFF)
S2	DWORD	X, Y, F, Z, T, C, M, S, L, D, UW
		Data address to execute the 'XOR' operation with S1
		0(h0000) to 4294967295(hFFFFFFFF)
D	DWORD	Y, F, Z, T, C, M, S, L, D, UW
		Address to save the operation result
		0(h0000) to 4294967295(hFFFFFFFF)
N	WORD	X, Y, F, Z, T, C, M, S, L, D, UW, integer
		The number of S2 data address and saved address to execute the operation with S1
		In the range within the corresponding device area of S2 and D

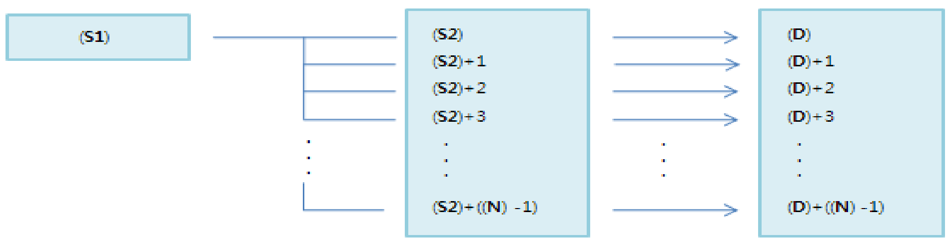
Error	Zero	Carry	Borrow	Step
	◎			9

<Ladder>



1. Executes the bitwise logical 'XOR' operation for every bit of S1 double word and the number of N double words from S2 to S2(N-1), and then stores the result into the number of N double words beginning with D.
2. If the result value is '0' double word, zero flag is SET.





3.2.181 Logical operation instruction(XNR)

Logical operation instruction	XNR	S1	S2	D

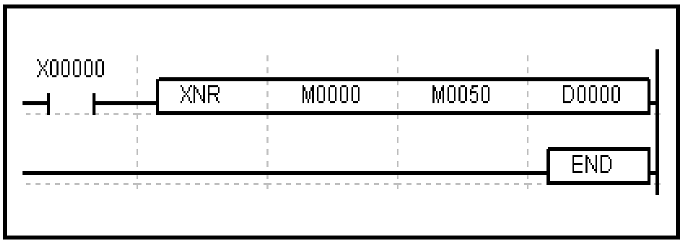
Applicable model

LP-S044, LP-S070

OP	DATA type	Available device / Description / Range
S1	WORD	X, Y, F, Z, T, C, M, S, L, D, UW, integer
		Data address to execute the ‘XNR’ operation with S2
		0(h0000) to 65535(hFFFF)
S2	WORD	X, Y, F, Z, T, C, M, S, L, D, UW, integer
		Data address to execute the ‘XNR’ operation with S1
		0(h0000) to 65535(hFFFF)
D	WORD	Y, F, Z, T, C, M, S, L, D, UW
		Address to save the operation result
		0(h0000) to 65535(hFFFF)

Error	Zero	Carry	Borrow	Step
	◎			7

<Ladder>



1. Executes the logical ‘XNR’ operation for every bit of S1 word and the corresponding bit of S2 word, bit by bit, and then stores the result into the D word.
2. If the result value is ‘0’, zero flag is SET.

	B15															B0
(S1)	1	0	1	1	0	0	1	1	1	1	0	0	0	1	0	1

XNR

	B15															B0
(S2)	1	1	0	0	0	0	0	1	1	1	1	0	1	1	0	0

||

	B15															B0
(D)	1	0	0	0	1	1	0	1	1	1	0	1	0	1	1	0

3.2.182 Logical operation instruction(DXNR)

Logical operation instruction	DXNR	S1	S2	D

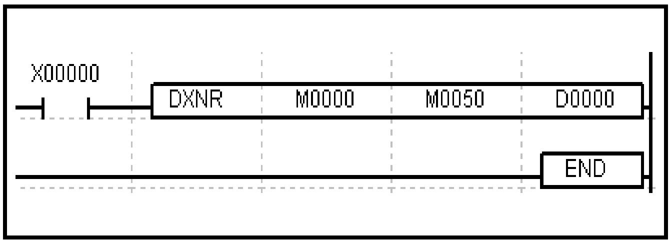
Applicable model

LP-S044, LP-S070

OP	DATA type	Available device / Description / Range
S1	DWORD	X, Y, F, Z, T, C, M, S, L, D, UW, integer
		Data address to execute the 'XNR' operation with S2
		0(h0000) to 4294967295(hFFFFFFFF)
S2	DWORD	X, Y, F, Z, T, C, M, S, L, D, UW, integer
		Data address to execute the 'XNR' operation with S1
		0(h0000) to 4294967295(hFFFFFFFF)
D	DWORD	Y, F, Z, T, C, M, S, L, D, UW
		Address to save the operation result
		0(h0000) to 4294967295(hFFFFFFFF)

Error	Zero	Carry	Borrow	Step
	◎			7

<Ladder>



1. Executes the logical 'XNR' operation for every bit of S1 double word and the corresponding bit of S2 double word, and then stores the result into the D double word.
2. If the result value is '0', zero flag is SET.

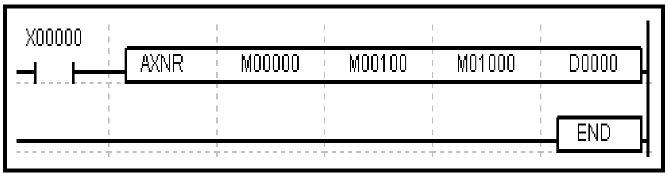
3.2.183 Logical operation instruction(AXNR)

Logical operation instruction	AXNR	S1	S2	D	N	Applicable model
						LP-S044, LP-S070

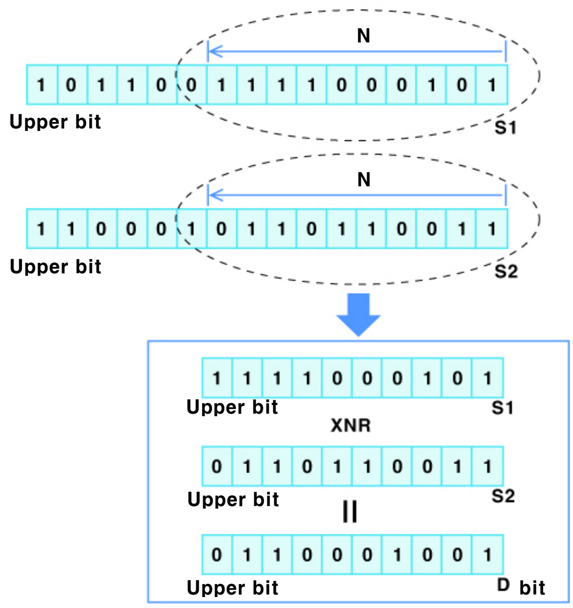
OP	DATA type	Available device / Description / Range
S1	BIT	X, Y, F, T, C, M, UB
		Start address of the bit device to execute the 'XNR' operation with S2
		Not applicable
S2	BIT	X, Y, F, T, C, M, UB
		Start address of the bit device to execute the 'XNR' operation with S1
		Not applicable
D	BIT	Y, F, T, C, M, UB
		Start address of the bit device to save the operation result
		Not applicable
N	WORD	X, Y, F, Z, T, C, M, S, L, D, UW, integer
		The number of bit devices to execute the operation including the start address
		As many as the number of devices remained in the corresponding S1, S2, and D area

Error	Zero	Carry	Borrow	Step
	◎			9

<Ladder>



Executes the logical 'XNR' operation for the number of N bits from S1 to SN and the number of N bits from S2 to S2(N-1), and then stores the result into the number of N bits beginning with D destination bit.



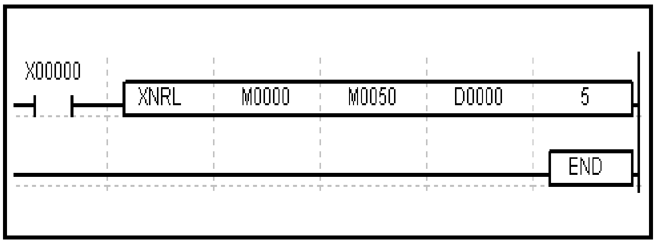
3.2.184 Logical operation instruction(XNRL)

Logical operation instruction	XNRL	S1	S2	D	N	Applicable model
						LP-S044, LP-S070

OP	DATA type	Available device / Description / Range
S1	WORD	X, Y, F, Z, T, C, M, S, L, D, UW, integer
		Data address to execute the 'XNR' operation with S2
		0(h0000) to 65535(hFFFF)
S2	WORD	X, Y, F, Z, T, C, M, S, L, D, UW
		Data address to execute the 'XNR' operation with S1
		0(h0000) to 65535(hFFFF)
D	WORD	Y, F, Z, T, C, M, S, L, D, UW
		Address to save the operation result
		0(h0000) to 65535(hFFFF)
N	WORD	X, Y, F, Z, T, C, M, S, L, D, UW, integer
		The number of S2 data address and saved address to execute the operation with S1
		In the range within the corresponding device area of S2 and D

Error	Zero	Carry	Borrow	Step
	◎			9

<Ladder>



1. Executes the bitwise logical 'XNR' operation for every bit of S1 word and the number of N words from S2 to S2(N-1) bit by bit, and then stores the result into the number of N words from D word.
2. If the result value is '0' word, zero flag is SET.

	B15															B0
(S1)	1	0	1	1	0	0	1	1	1	1	0	0	0	1	0	1
XNR																
(S2)	1	1	0	0	0	0	0	1	1	1	1	0	1	1	0	0
=																
(D)	1	0	0	0	1	1	0	1	1	1	0	1	0	1	1	0

3.2.185 Logical operation instruction(DXNRL)

Logical operation instruction	DXNRL	S1	S2	D	N

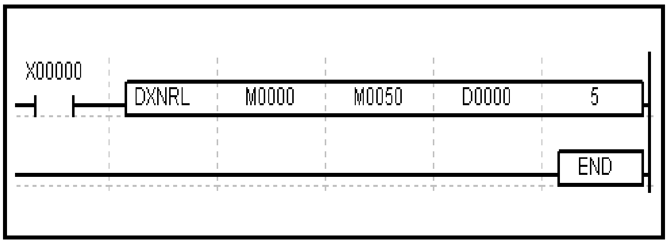
Applicable model

LP-S044, LP-S070

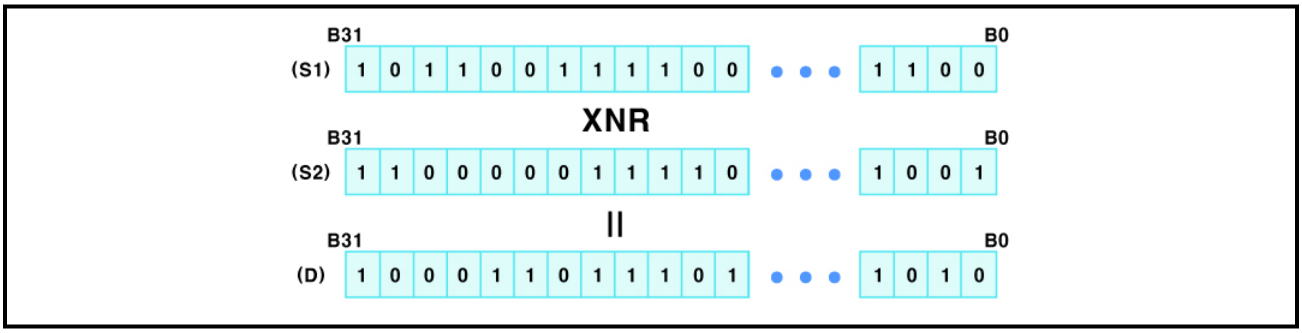
OP	DATA type	Available device / Description / Range
S1	DWORD	X, Y, F, Z, T, C, M, S, L, D, UW, integer
		Data address to execute the 'XNR' operation with S2
		0(h0000) to 4294967295(hFFFFFFFF)
S2	DWORD	X, Y, F, Z, T, C, M, S, L, D, UW
		Data address to execute the 'XNR' operation with S1
		0(h0000) to 4294967295(hFFFFFFFF)
D	DWORD	Y, F, Z, T, C, M, S, L, D, UW
		Address to save the operation result
		0(h0000) to 4294967295(hFFFFFFFF)
N	WORD	X, Y, F, Z, T, C, M, S, L, D, UW, integer
		The number of S2 data address and saved address to execute the operation with S1
		In the range within the corresponding device area of S2 and D

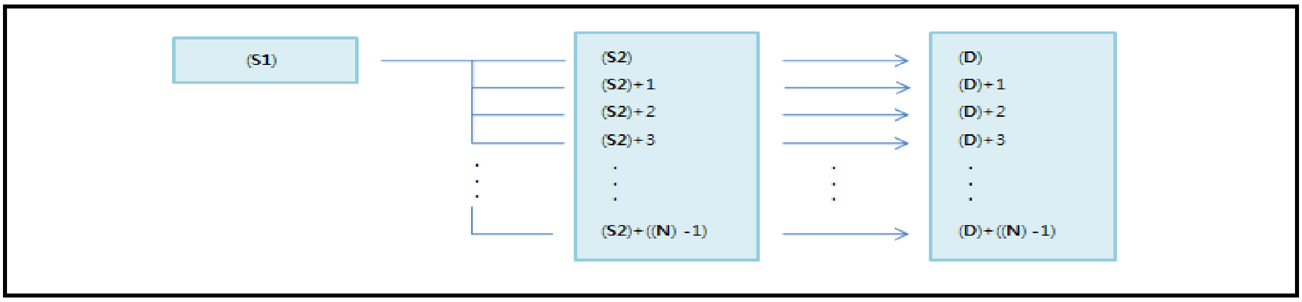
Error	Zero	Carry	Borrow	Step
	◎			9

<Ladder>



1. Executes the logical 'XNR' operation for every bit of S1 double word and the number of N double words from S2 to S2(N-1), bit by bit, and then stores the result into the number of N double words beginning with D.
2. If the result value is '0' double word, zero flag is SET.





3.2.186 BIN/BCD conversion instruction(BIN2BCD)

BIN/BCD conversion instruction | **BIN2BCD** | **S** | **D**

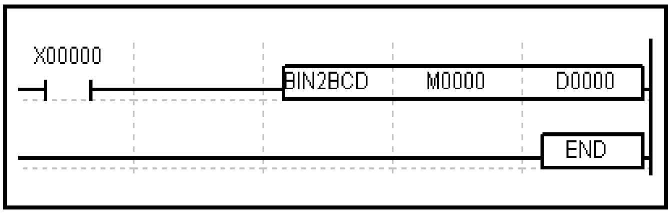
Applicable model

LP-S044, LP-S070

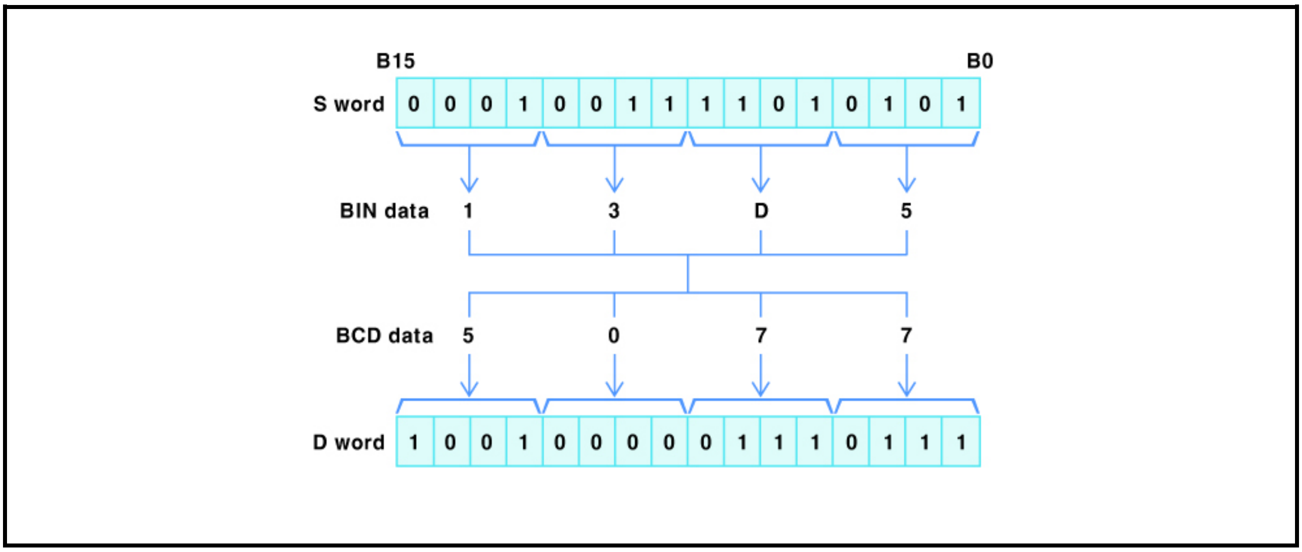
OP	DATA type	Available device / Description / Range
S	WORD	X, Y, F, Z, T, C, M, S, L, D, UW, integer
		Device number which has to be transmitted data or data
		0 to 9999(h0000 to h270F)
D	WORD	Y, F, Z, T, C, M, S, L, D, UW
		Device address to save converted data
		h0000 to h9999

Error	Zero	Carry	Borrow	Step
◎				5

<Ladder>



1. Converts the BINARY data (0 to h270F) stored in S device into the BCD data and then stores the result into the D word.
2. If the converted value is out of the range between 0 to 9999(BIN data 0 to h270F), error flag is SET.



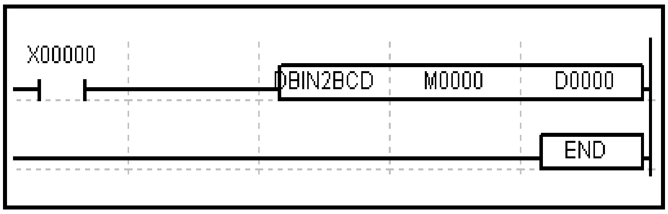
3.2.187 BIN/BCD conversion instruction(DBIN2BCD)

BIN/BCD conversion instruction	DBIN2BCD	S	D	Applicable model
				LP-S044, LP-S070

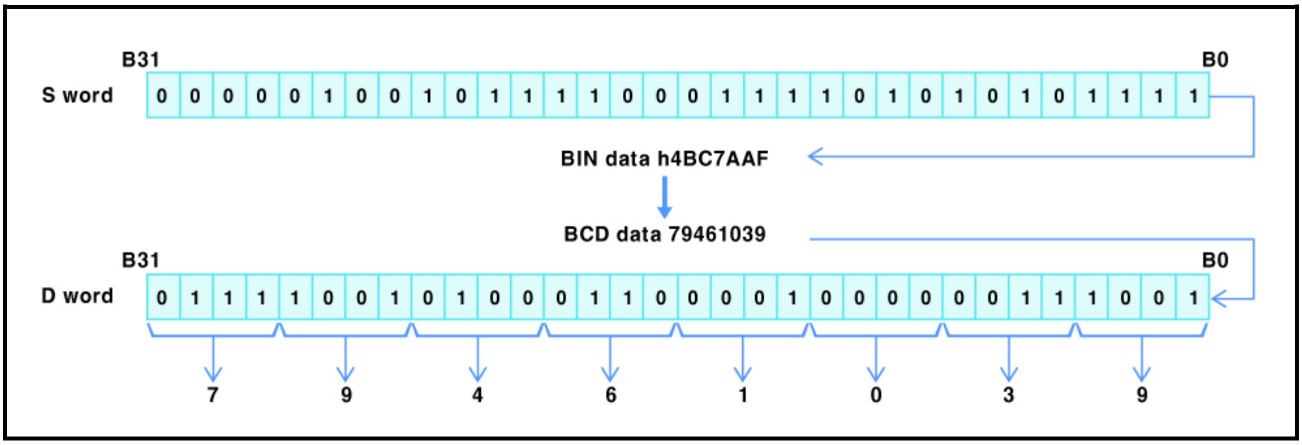
OP	DATA type	Available device / Description / Range
S	DWORD	X, Y, F, Z, T, C, M, S, L, D, UW, integer
		Device number which has to be transmitted data or data
		0 to 99999999(h00000000 to h05F5E0FF)
D	DWORD	Y, F, Z, T, C, M, S, L, D, UW
		Device address to save converted data
		h00000000 to h99999999

Error	Zero	Carry	Borrow	Step
◎				5

<Ladder>



1. Converts the BINARY data (0 to h05F5E0FF) stored in S double word into the BCD data, and then stores the result into the D double word.
2. If the converted value is out of the range from 0 to 99999999(BIN data 0 to h05F5E0FF), error flag is SET.



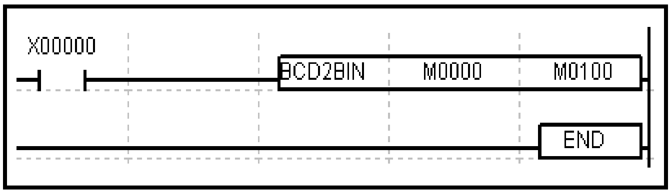
3.2.188 BIN/BCD conversion instruction(BCD2BIN)

BIN/BCD conversion instruction	BCD2BIN	S	D	Applicable model
				LP-S044, LP-S070

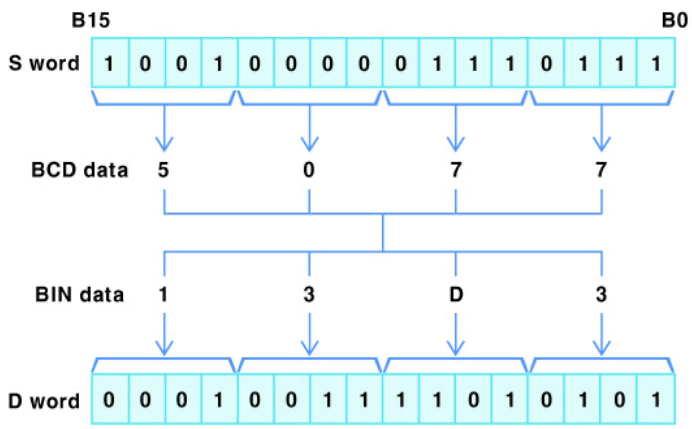
OP	DATA type	Available device / Description / Range
S	WORD	X, Y, M, S, T, C, D, Z, F, UW, integer
		Device address which saves BCD data to be converted as BIN value
		h0000 to h9999
D	WORD	Y, M, S, T, C, D, Z, F, UW
		Device address to save converted data
		0 to 9999(h0000 to h270F)

Error	Zero	Carry	Borrow	Step
◎				5

<Ladder>



1. Converts the BCD code (0 to 9999) stored in S word into the BINARY data, and then stores the result into the D word.
2. If the S word is not the BCD code, error flag is SET.



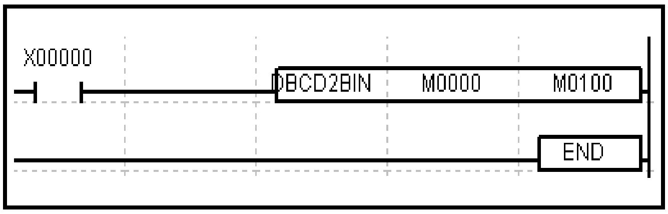
3.2.189 BIN/BCD conversion instruction(DBCD2BIN)

BIN/BCD conversion instruction	DBCD2BIN	S	D	Applicable model
				LP-S044, LP-S070

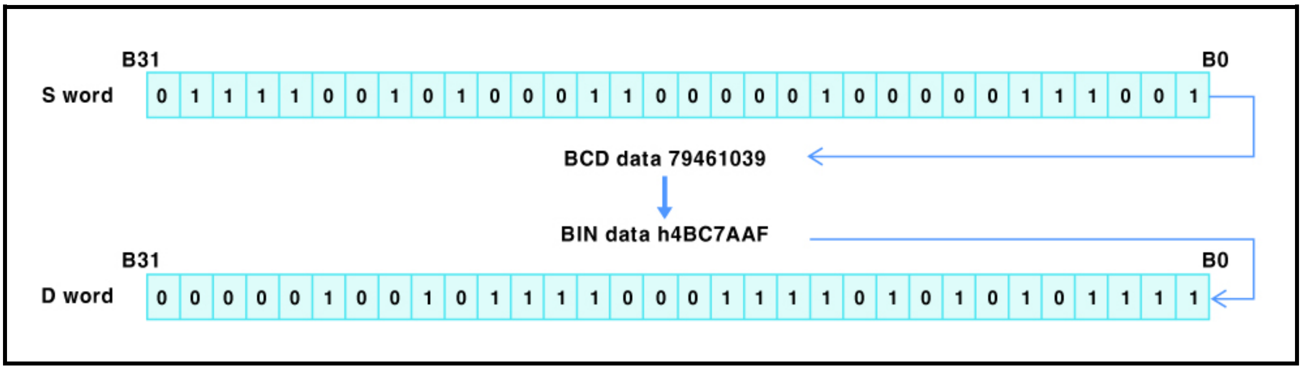
OP	DATA type	Available device / Description / Range
S	DWORD	X, Y, M, S, T, C, D, Z, F, UW, integer
		Device address which saves BCD data to be converted as BIN value
		h00000000 to h99999999
D	DWORD	Y, M, S, T, C, D, Z, F, UW
		Device address to save converted data
		0 to 99999999(h00000000 to h05F5E0FF)

Error	Zero	Carry	Borrow	Step
◎				5

<Ladder>



1. Converts the BCD data stored in S double word into the BINARY data, and then stores the result into the D double word.
2. If the S double word is not the BCD code, error flag is SET.



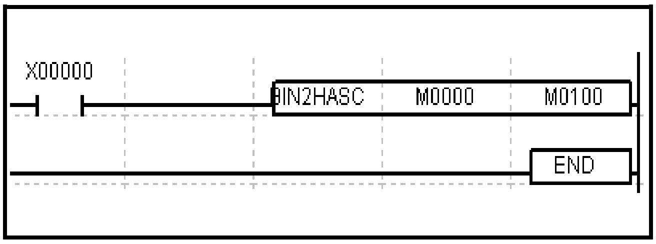
3.2.190 String conversion instruction(BIN2HASC)

String conversion instruction	BIN2HASC	S	D	Applicable model
				LP-S044, LP-S070

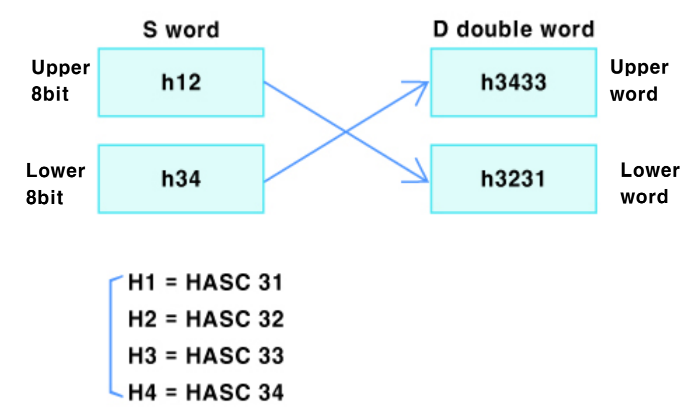
OP	DATA type	Available device / Description / Range
S	WORD	X, Y, M, S, T, C, D, Z, F, UW, integer
		Device address which saves to be converted data as ASCII value
		h0000 to hFFFF
D	WORD	Y, M, S, T, C, D, Z, F, UW
		Device address to save converted data
		Allowable range per byte(h30 to h39, h41 to h46)

Error	Zero	Carry	Borrow	Step
				5

<Ladder>



1. Converts the BINARY data stored in S word into the HEX ASCII one by one in order from the upper order value.
2. The converted value is sequentially stored in D double word beginning with D, by 2 digits per word.
3. The operation range is ‘h0000 to hFFFF’.



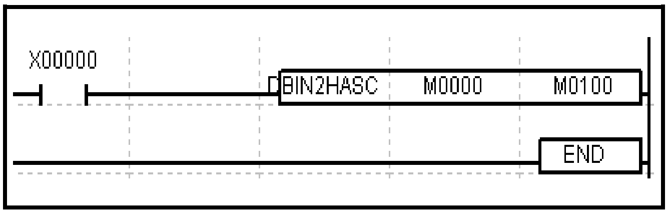
3.2.191 String conversion instruction(DBIN2HASC)

String conversion instruction	DBIN2HASC	S	D	Applicable model
				LP-S044, LP-S070

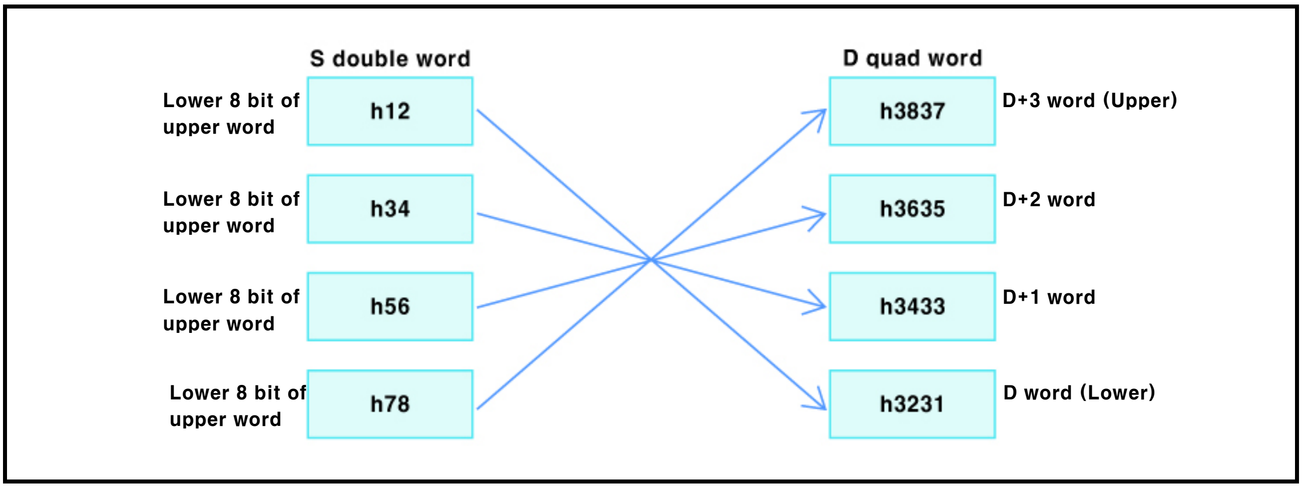
OP	DATA type	Available device / Description / Range
S	DWORD	X, Y, M, S, T, C, D, Z, F, UW, integer
		Device address which saves to be converted data as ASCII value
		h00000000 to hFFFFFFFF
D	QWORD	Y, M, S, T, C, D, Z, F, UW
		Device address to save converted data
		Allowable range per byte (h30 to h39, h41 to h46)

Error	Zero	Carry	Borrow	Step
				5

<Ladder>



1. Converts the BINARY data stored in S double word into the HEX ASCII one by one in order from the upper order value.
2. The converted value is sequentially stored in D quad word beginning with D, by 2 digits per word.
3. The operation range is h00000000 to HFFFFFFFF.



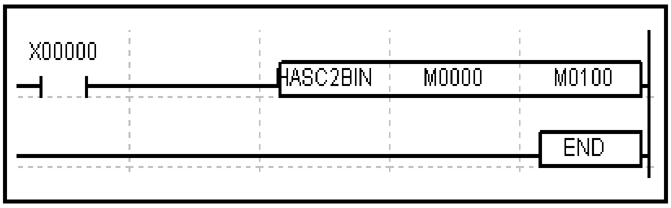
3.2.192 String conversion instruction(HASC2BIN)

String conversion instruction	HASC2BIN	S	D	Applicable model
				LP-S044, LP-S070

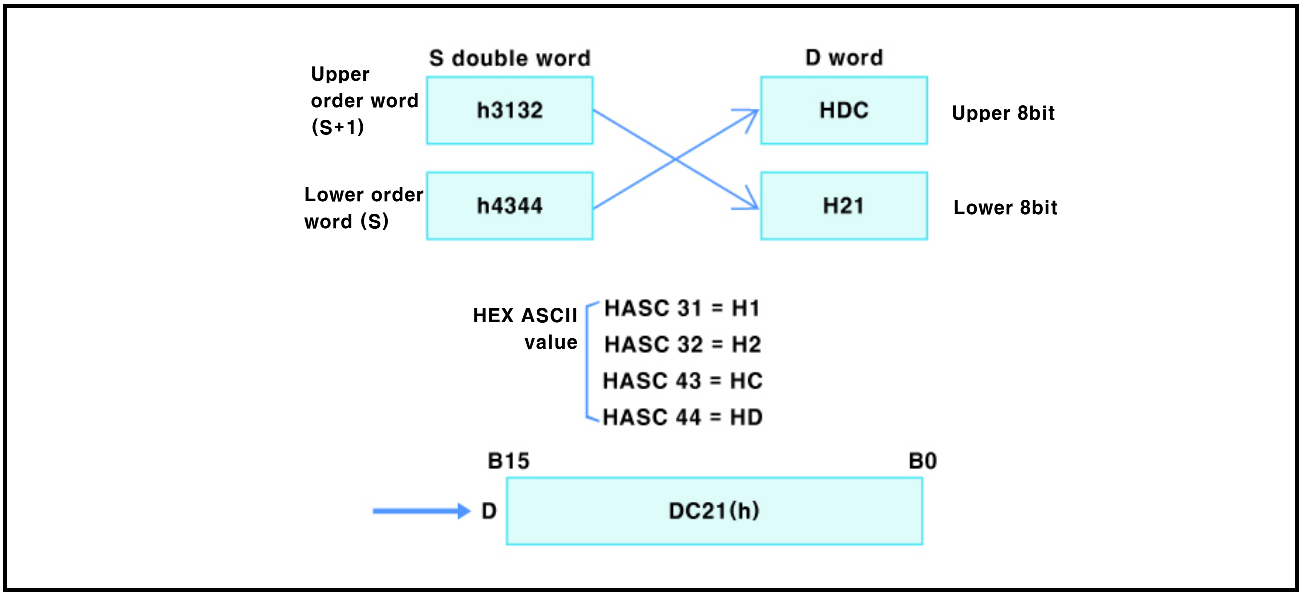
OP	DATA type	Available device / Description / Range
S	WORD	X, Y, M, S, T, C, D, Z, F, UW
		Device address which saves HEX ASCII value to be converted data as BIN value
		Allowable range per byte (h30 to h39, h41 to h46)
D	WORD	Y, M, S, T, C, D, Z, F, UW
		Device address to save converted data
		h0000 to hFFFF

Error	Zero	Carry	Borrow	Step
◎				5

<Ladder>



1. Recognizes the double word value of S as ASCII and stores the corresponding value into the D word.
2. If the converted value is not the HEX ASCII, error bit (F34) is SET. (h30 to h39, h41 to h46)



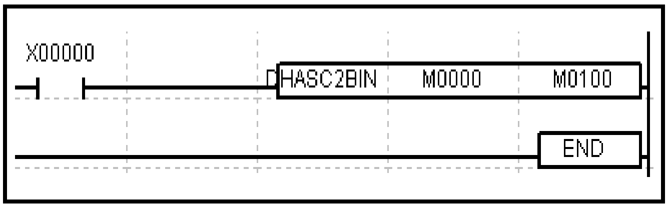
3.2.193 String conversion instruction(DHASC2BIN)

String conversion instruction	DHASC2BIN	S	D	Applicable model
				LP-S044, LP-S070

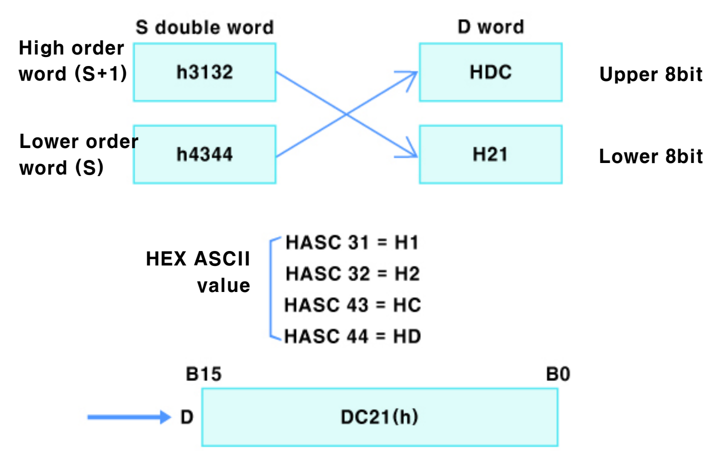
OP	DATA type	Available device / Description / Range
S	DWORD	X, Y, M, S, T, C, D, Z, F, UW
		Device address which saves HEX ASCII value to be converted data as BIN value
		Allowable range per byte (h30 to h39, h41 to h46)
D	DWORD	Y, M, S, T, C, D, Z, F, UW
		Device address to save converted data
		h00000000 to hFFFFFFFF

Error	Zero	Carry	Borrow	Step
◎				5

<Ladder>



1. Recognizes the quad word value of S as ASCII and stores the corresponding value into the D double word.
2. If the converted value is not the HEX ASCII, error bit (F34) is SET. (h30 to h39, h41 to h46)



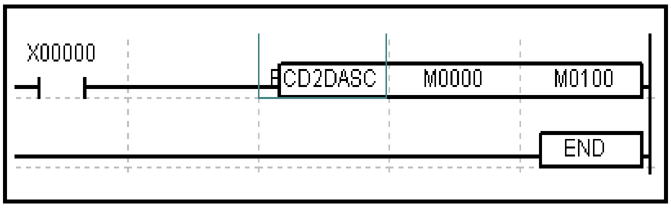
3.2.194 String conversion instruction(BCD2DASC)

String conversion instruction	BCD2DASC	S	D	Applicable model
				LP-S044, LP-S070

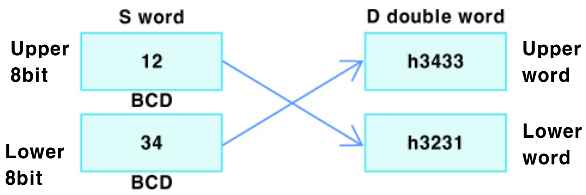
OP	DATA type	Available device / Description / Range
S	WORD	X, Y, M, S, T, C, D, Z, F, UW, integer
		Device address which saves the data to be converted data as ASCII value
		h0000 to hFFFF
D	DWORD	Y, M, S, T, C, D, Z, F, UW
		Device address to save converted data
		Allowable range per byte (h30 to h39, h41 to h46)

Error	Zero	Carry	Borrow	Step
◎				5

<Ladder>



1. Recognizes BCD data stored in S word as decimal number, converts each digit into the ASCII value and then stores them sequentilally into the D double word.
2. The operation range is ‘h0000 to h9999’.
3. If the S word is not the BCD code, error flag is SET.



3.2.195 String conversion instruction(DBCD2DASC)

String conversion instruction **DBCD2DASC** **S** **D**

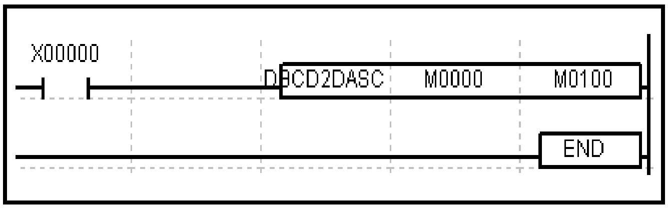
Applicable model

LP-S044, LP-S070

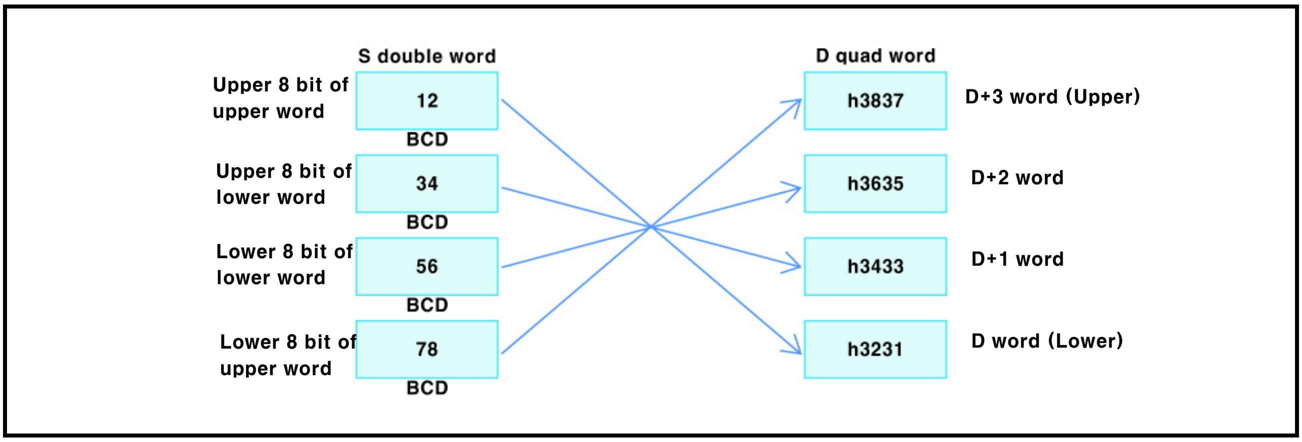
OP	DATA type	Available device / Description / Range
S	DWORD	X, Y, M, S, T, C, D, Z, F, UW, integer
		Device address which saves the BCD data to be converted data as ASCII value
		h00000000 to h999999999
D	QWORD	Y, M, S, T, C, D, Z, F, UW
		Device address to save converted data
		Allowable range per byte (h30 to h39, h41 to h46)

Error	Zero	Carry	Borrow	Step
◎				5

<Ladder>



1. Recognizes BCD data stored in S double word as decimal number, converts each digit into the ASCII value and then stores them sequentially into the D word.
2. The operation range is h00000000 to h99999999.
3. If the S word is not the BCD code, error flag is SET.



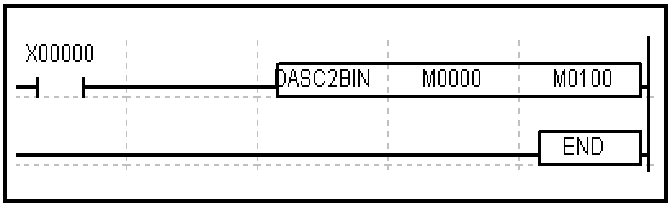
3.2.196 String conversion instruction(DASC2BIN)

String conversion instruction	DASC2BIN	S	D	Applicable model
				LP-S044, LP-S070

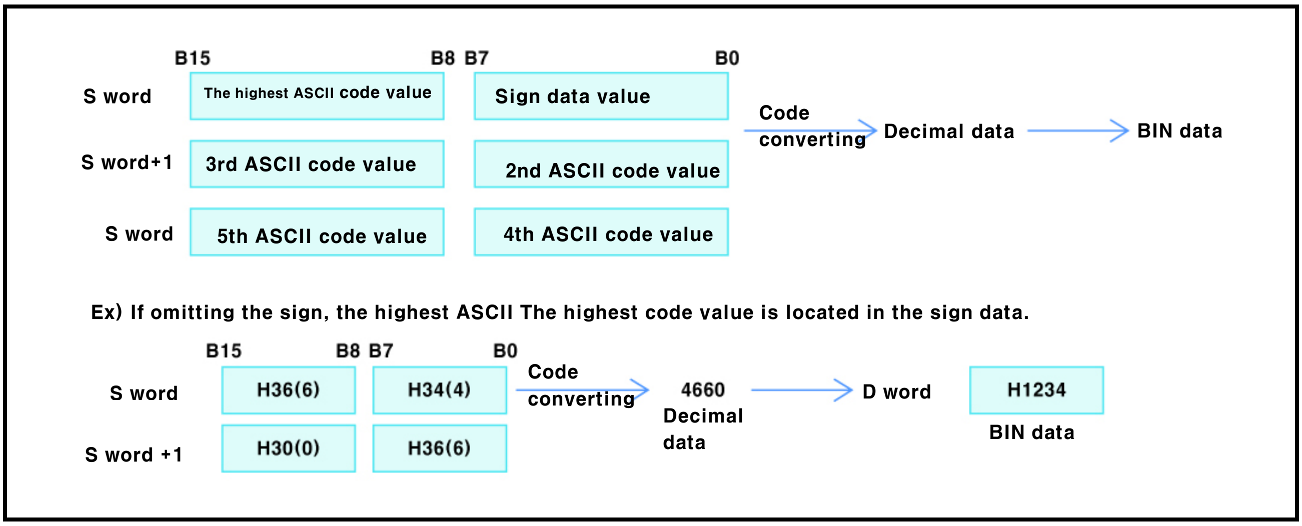
OP	DATA type	Available device / Description / Range
S	WORD	X, Y, M, S, T, C, D, Z, F, UW
		Device address which saves the Dec ASCII data to be converted as BIN value
		h30 to h39 per byte except sign bit (h2D, h28)
D	WORD	Y, M, S, T, C, D, Z, F, UW
		Device address to save converted data
		-32768(h8000) to 32767(h7FFF)

Error	Zero	Carry	Borrow	Step
◎				5

<Ladder>



1. Recognizes the ASCII data stored in S word as decimal number, convert each digit into the BINARY value, and then stores them into the D word.
2. The lower order byte of the first source word determines the sign of the BINARY value.
3. The sign value is +(H2B), -(H2D).
4. If the sign value is positive, it can be omitted.
5. The D word is stored as Signed.
6. The operation range is -32768(h8000) to 32767(h7FFF).
7. If the S word is not in the valid ASCII(h30 to h39) range, corresponding to 0 to 9, error bit (F34) is SET.



3.2.197 String conversion instruction(DDASC2BIN)

String conversion instruction **DDASC2BIN** **S** **D**

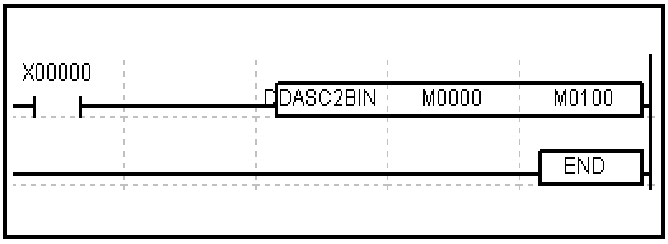
Applicable model

LP-S044, LP-S070

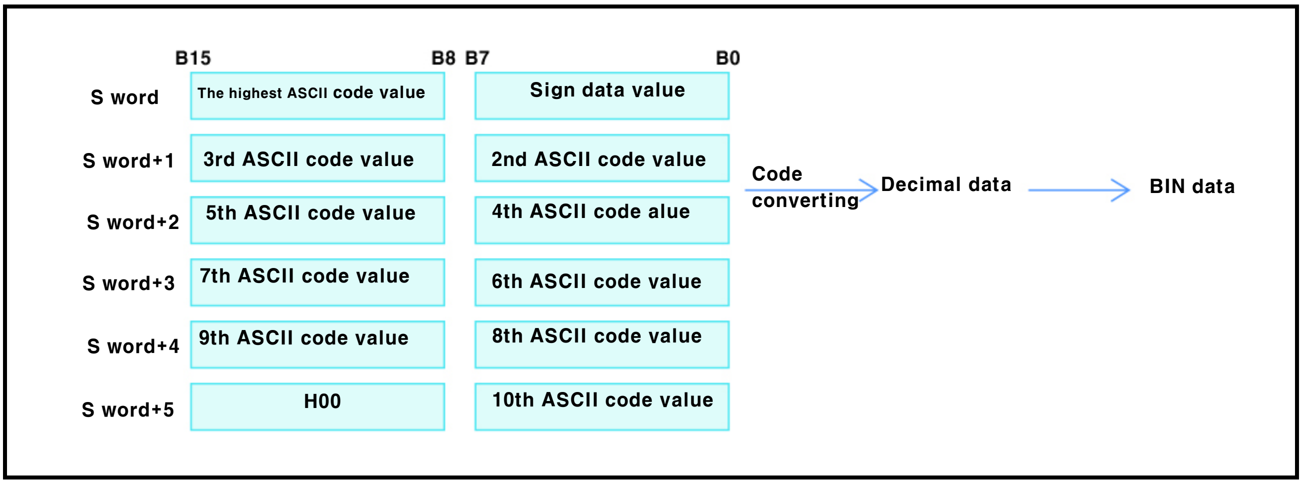
OP	DATA type	Available device / Description / Range
S	WORD	X, Y, M, S, T, C, D, Z, F, UW, integer
		Device address which saves the Dec ASCII data to be converted as BIN value
		h30 to h39 per byte except sign bit (h2D, h28)
D	DINT	Y, M, S, T, C, D, Z, F, UW
		Device address to save converted data
		-2147483648(h80000000) to 2147483647(hFFFFFFFF)

Error	Zero	Carry	Borrow	Step
◎				5

<Ladder>



1. Recognizes the ASCII data stored in S word as decimal number and convert each digit into the BINARY value then stores them into the D word.
2. The lower order byte of the first source word determines the sign of the BINARY value.
3. The sign value is +(H2B), -(H2D).
4. If the sign value is positive, it can be omitted.
5. The D word is stored as Signed.
6. The operation range is -2147483648 (h80000000) to 2147483647 (h7FFFFFFF).
7. If the S word is not in the valid ASCII(h30 to h39) range, corresponding to 0 to 9, error bit (F34) is SET.



3.2.198 String conversion instruction(STR2ASC)

String conversion instruction **STR2ASC** **S** **D**

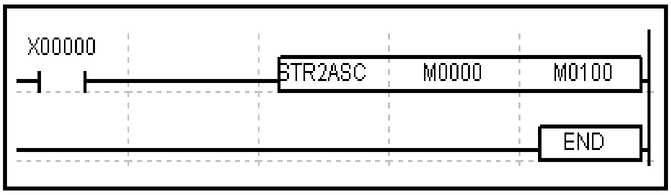
Applicable model

LP-S044, LP-S070

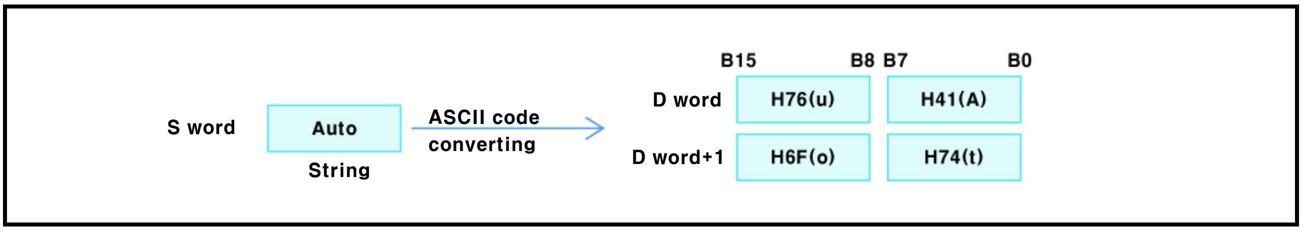
OP	DATA type	Available device / Description / Range
S	STRING	STRING
		STRING data to convert as ASCII value
		String
D	WORD	Y, M, S, T, C, D, Z, F, UW
		Device address to save converted data
		ASCII value

Error	Zero	Carry	Borrow	Step
				7

<Ladder>



1. Converts STRING into the ASCII and then stores it sequentially into the D.
2. It is available to input up to 128 characters.



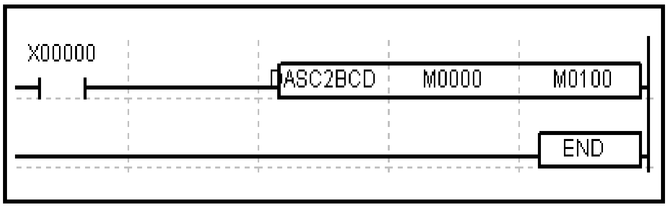
3.2.199 String conversion instruction(DASC2BCD)

String conversion instruction	DASC2BCD	S	D	Applicable model
				LP-S044, LP-S070

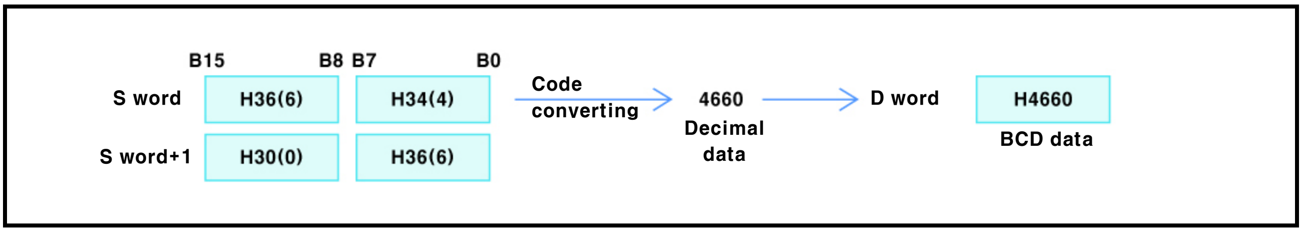
OP	DATA type	Available device / Description / Range
S	WORD	X, Y, M, S, T, C, D, Z, F, UW, integer
		Device address which saves the Dec ASCII data to be converted as BCD value
		h30 to h39 per byte except sign bit (h2D, h28)
D	WORD	Y, M, S, T, C, D, Z, F, UW
		Device address to save converted data
		h0000 to h9999

Error	Zero	Carry	Borrow	Step
◎				5

<Ladder>



1. Recognizes the ASCII data stored in S word as decimal number and convert it into the BCD code then stores it into the D word.
2. The converted value is stored as Unsigned and the operation range is h0000 to h9999.
3. If the converted result is not in the valid ASCII range(h30 to h39), error flag is SET.



3.2.200 String conversion instruction(DDASC2BCD)

String conversion instruction **DDASC2BCD** **S** **D**

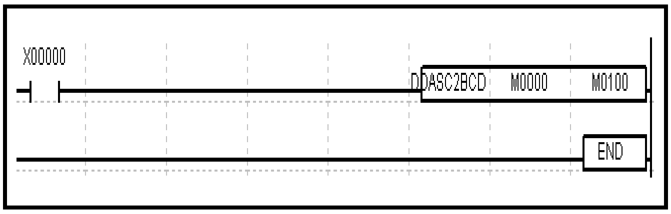
Applicable model

LP-S044, LP-S070

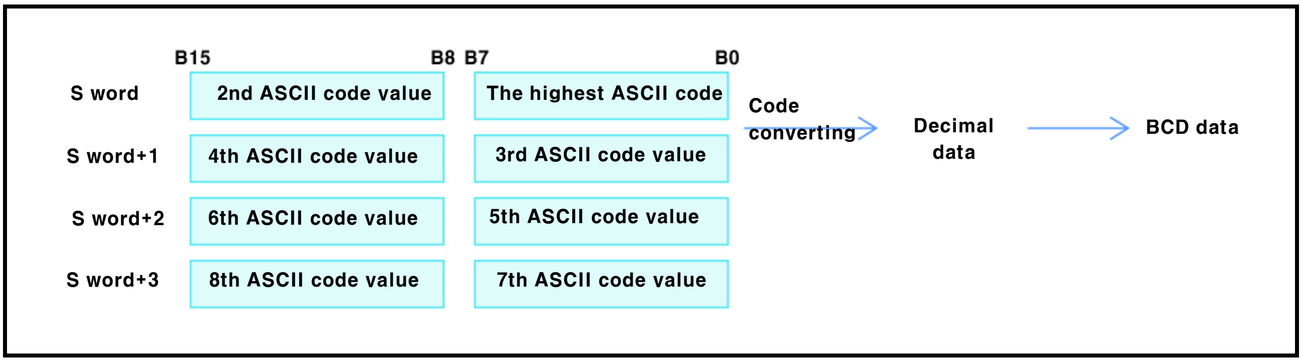
OP	DATA type	Available device / Description / Range
S	WORD	X, Y, M, S, T, C, D, Z, F, UW, integer
		Device address which saves the Dec ASCII data to be converted as BCD value
		Allowable range per byte (h30 to h39)
D	DWORD	Y, M, S, T, C, D, Z, F, UW
		Device address to save converted data
		h00000000 to h99999999

Error	Zero	Carry	Borrow	Step
◎				5

<Ladder>



1. Recognizes the ASCII data stored in S word as decimal number and convert it into the BCD code, then stores it into the D word one by one.
2. The converted value is stored as Unsigned, and the operation range is ‘h00000000 to h99999999’.
3. If the converted result is not in the valid ASCII range (h30 to h39), error flag is SET. (BCD range: 0 to 9)



3.2.201 String conversion instruction(BIN2DASC)

String conversion instruction BIN2DASC S D

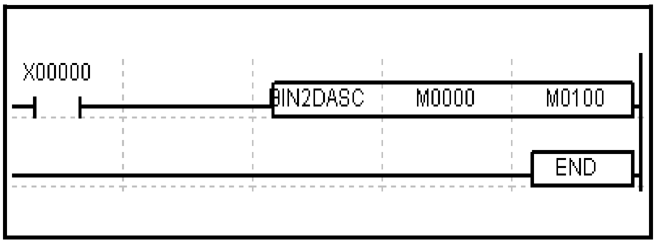
Applicable model

LP-S044, LP-S070

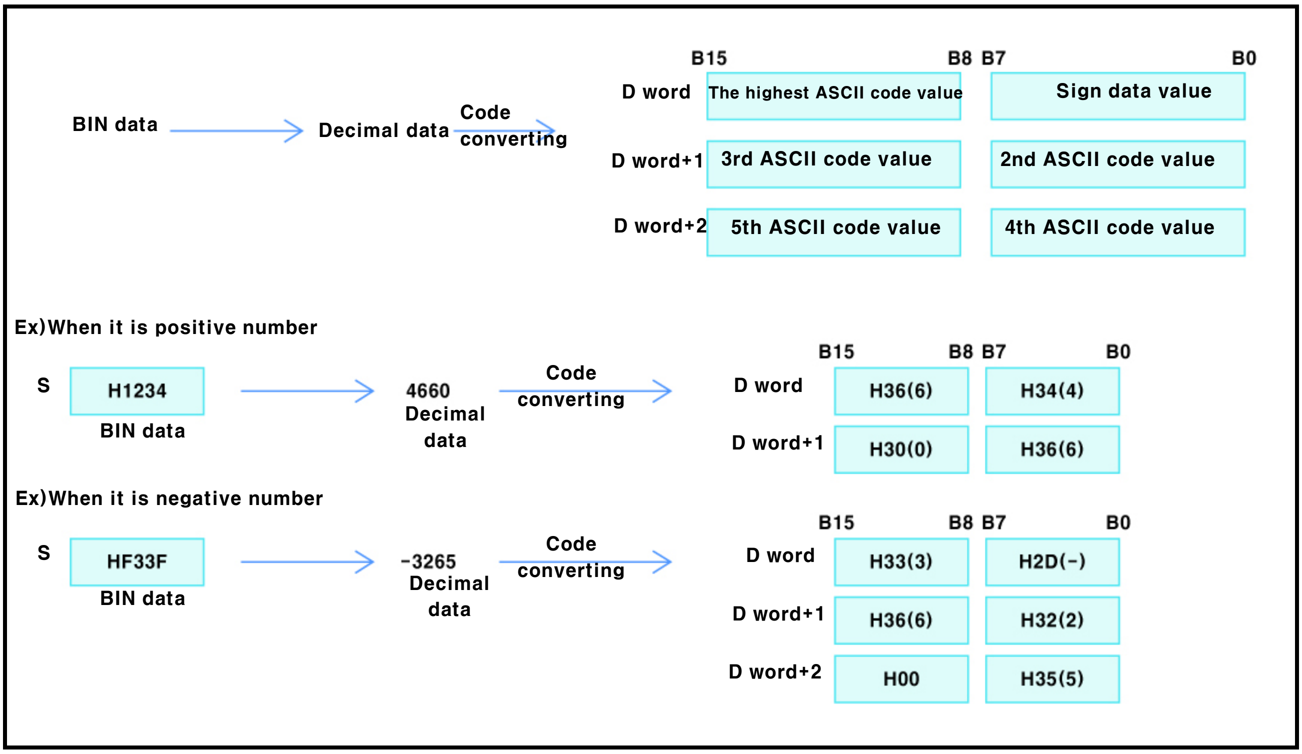
OP	DATA type	Available device / Description / Range
S	WORD	X, Y, M, S, T, C, D, Z, F, UW, integer
		Device address which saves the data to be converted as ASCII value
		-32768(h8000) to 32767(h7FFF)
D	WORD	Y, M, S, T, C, D, Z, F, UW
		Device address to save converted data
		h30 to h39 per byte except sign bit (h2D, h28)

Error	Zero	Carry	Borrow	Step
				5

<Ladder>



1. Recognizes the BIN data stored in S word as decimal number and converts it into the ASCII code, then stores it sequentially into the D, beginning with D word, by 2 digits per word.
2. If the word value of S is negative, the sign value '–(H2D)' will firstly be output on the first byte of D word.
3. Executes the Signed operation, and the operation range is -32768(h8000) to 32767(h7FFF).



3.2.202 String conversion instruction(DBIN2DASC)

String conversion instruction **DBIN2DASC** **S** **D**

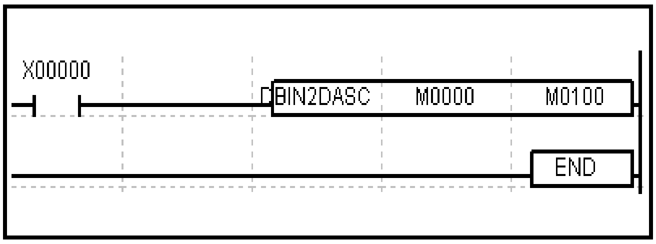
Applicable model

LP-S044, LP-S070

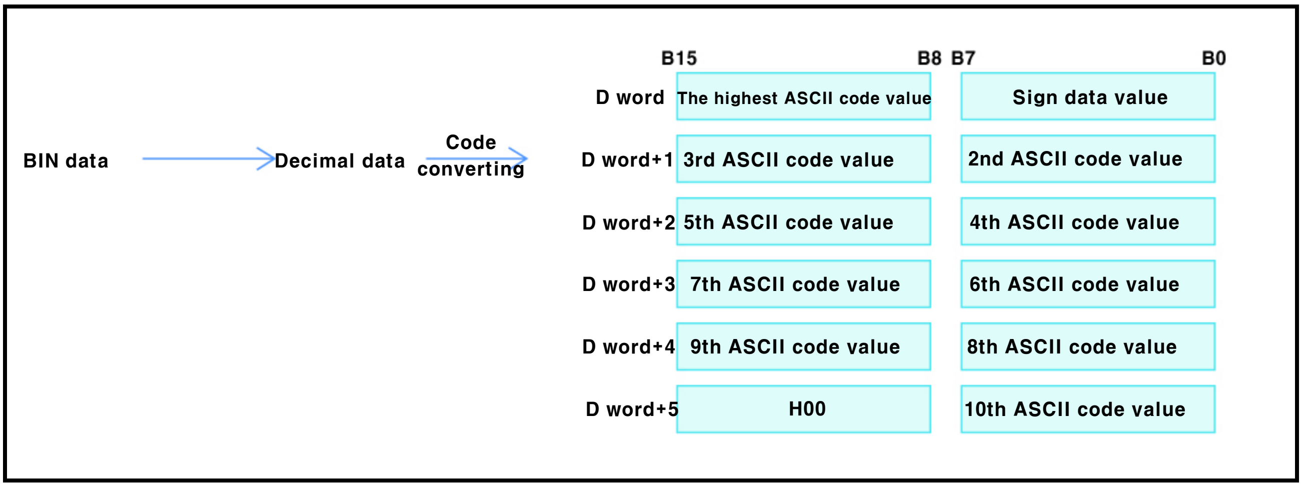
OP	DATA type	Available device / Description / Range
S	DINT	X, Y, M, S, T, C, D, Z, F, UW, integer
		Device address which saves the data to be converted as ASCII value
		-2147483648(h80000000) to 2147483647(hFFFFFFFF)
D	WORD	Y, M, S, T, C, D, Z, F, UW
		Device address to save converted data
		h30 to h39 per byte except sign bit (h2D, h28)

Error	Zero	Carry	Borrow	Step
◎				5

<Ladder>



1. Recognizes the BIN data stored in S double word as decimal number and converts it into the ASC II, then stores it into the D word beginning with D, by 2 digits per word.
2. If the word value of S is negative, the sign value '–(H2D)' will firstly be output on the first byte of D word.
3. Executes the Signed operation, and the operation range is -2147483648 (h80000000) to 2147483647(h7FFFFFFF).



3.2.203 Code conversion instruction(GRY2BIN)

Code conversion instruction **GRY2BIN** **S** **D**

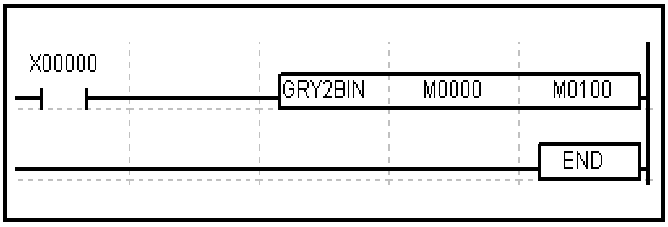
Applicable model

LP-S044, LP-S070

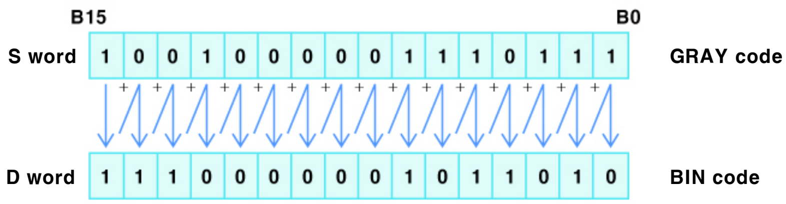
OP	DATA type	Available device / Description / Range
S	WORD	X, Y, M, S, T, C, D, Z, F, UW, integer
		Device address which saves the GRAY code data to be converted as BIN value
		0(h0000) to 65535(hFFFF)
D	WORD	Y, M, S, T, C, D, Z, F, UW
		Device address to save converted data
		0(h0000) to 65535(hFFFF)

Error	Zero	Carry	Borrow	Step
				5

<Ladder>



Converts the GRAY code data stored in S word into the BINARY data and stores it into the D.



3.2.204 Code conversion instruction(DGRY2BIN)

Code conversion instruction **DGRY2BIN S D**

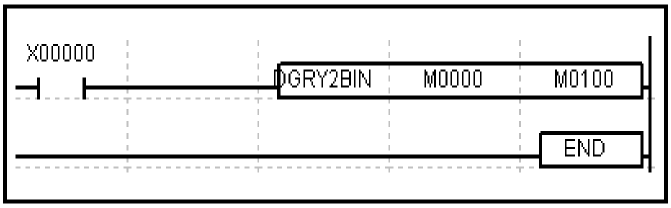
Applicable model

LP-S044, LP-S070

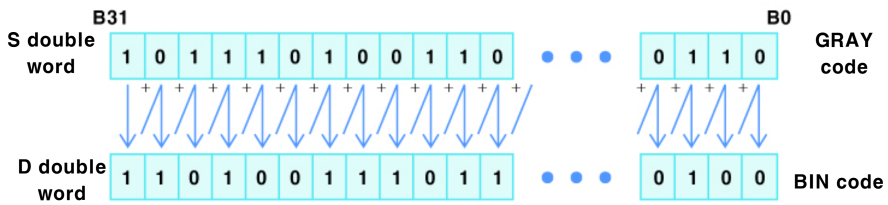
OP	DATA type	Available device / Description / Range
S	DWORD	X, Y, M, S, T, C, D, Z, F, UW, integer
		Device address which saves the GRAY code data to be converted as BIN value
		0(h00000000) to 4294967295(hFFFFFFFF)
D	DWORD	Y, M, S, T, C, D, Z, F, UW
		Device address to save converted data
		0(h00000000) to 4294967295(hFFFFFFFF)

Error	Zero	Carry	Borrow	Step
				5

<Ladder>



Converts the GRAY code data stored in S double word into the BINARY data and stores it into the D double word.



3.2.205 Code conversion instruction(BIN2GRY)

Code conversion instruction	BIN2GRY	S	D

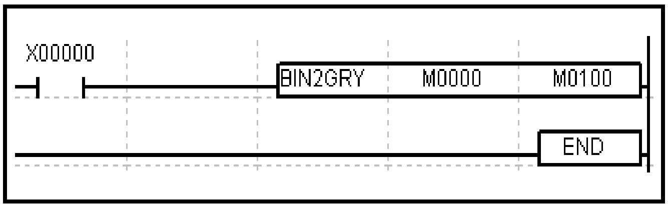
Applicable model

LP-S044, LP-S070

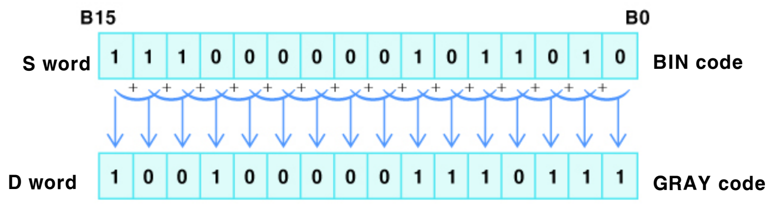
OP	DATA type	Available device / Description / Range
S	WORD	X, Y, M, S, T, C, D, Z, F, UW, integer
		Device address which saves the data to be converted as GRAY code value
		0(h0000) to 65535(hFFFF)
D	WORD	Y, M, S, T, C, D, Z, F, UW
		Device address to save converted data
		0(h0000) to 65535(hFFFF)

Error	Zero	Carry	Borrow	Step
				5

<Ladder>



Converts the BINARY code data stored in S word into the GRAY code data and then stores it into the D word.



3.2.206 Code conversion instruction(DBIN2GRY)

Code conversion instruction **DBIN2GRY S D**

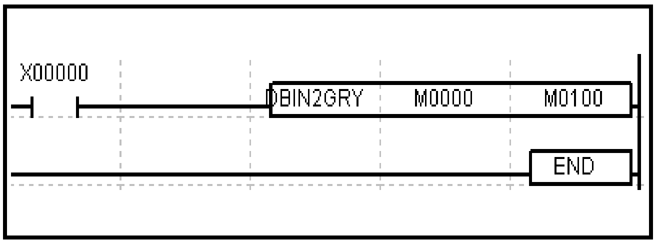
Applicable model

LP-S044, LP-S070

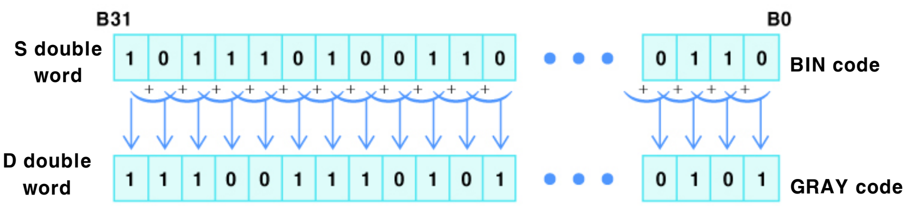
OP	DATA type	Available device / Description / Range
S	DWORD	X, Y, M, S, T, C, D, Z, F, UM, integer
		Device address which saves the data to be converted as GRAY code value
		0(h00000000) to 4294967295(hFFFFFFFF)
D	DWORD	Y, M, S, T, C, D, Z, F, UW
		Device address to save converted data
		0(h00000000) to 4294967295(hFFFFFFFF)

Error	Zero	Carry	Borrow	Step
				5

<Ladder>



Converts the BINARY code data stored in S double word into the GRAY code data and then stores it into the D double word.



3.2.207 Sign reversal instruction(NEG)

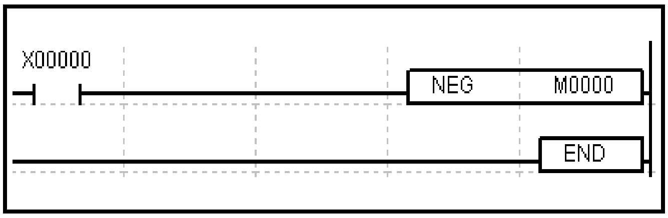
Sign reversal instruction **NEG** **D**

Applicable model

LP-S044, LP-S070

OP	DATA type	Available device / Description / Range	Error	Zero	Carry	Borrow	Step
D	WORD	Y, M, S, T, C, D, Z, F, UW					
		Device address to convert sign					
		0(h0000) to 65535(hFFFF)					3

<Ladder>



Reverses the sign of D word.

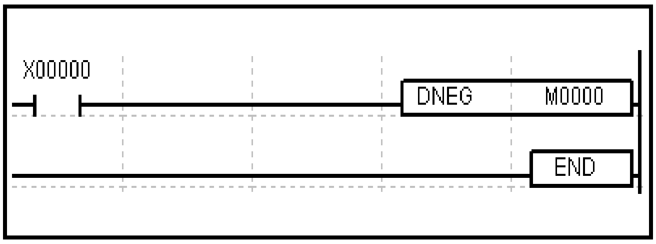
3.2.208 Sign reversal instruction(DNEG)

Sign reversal instruction	DNEG	D	Applicable model
			LP-S044, LP-S070

OP	DATA type	Available device / Description / Range
D	DWORD	Y, M, S, T, C, D, Z, F, UW
		Device address to convert sign
		0(h00000000) to 4294967295(hFFFFFFFF)

Error	Zero	Carry	Borrow	Step
				3

<Ladder>



Reverses the sign of D double word.

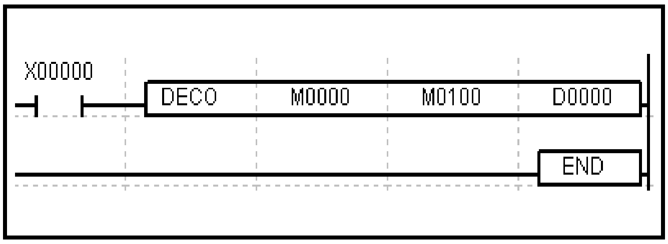
3.2.209 Data conversion instruction(DECO)

Data conversion Instruction	DECO	S	D	N	Applicable model
					LP-S044, LP-S070

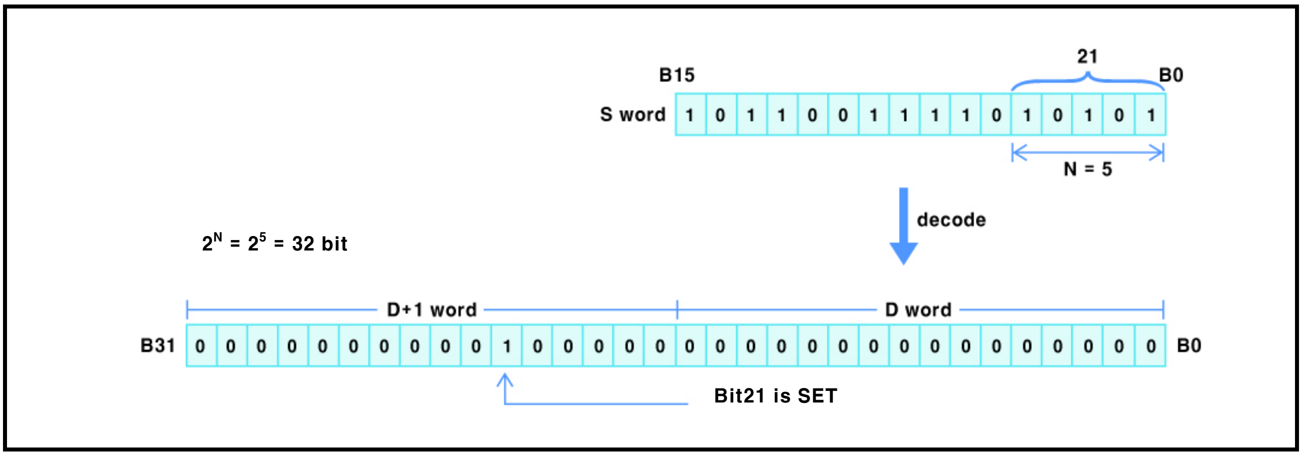
OP	DATA type	Available device / Description / Range
S	WORD	X, Y, M, S, T, C, D, Z, F, UW
		Data address to execute the decoder operation
		0(h0000) to 65535(hFFFF)
D	WORD	Y, M, S, T, C, D, Z, F, UW
		Address to save the operation result
		0(h0000) to 65535(hFFFF)
N	WORD	X, Y, M, S, T, C, D, Z, F, UW, integer
		The number of bits to be decoded
		0 to 8

Error	Zero	Carry	Borrow	Step
◎				7

<Ladder>



1. Decodes the number of B bits stored in S word from 0 to N and stores the result into the D word.
2. If the N is 0, it does not execute the instruction.
3. If the decoded value is not in the range from 0 to 8, error flag is SET.



3.2.210 Data conversion instruction(ENCO)

Data conversion instruction	ENCO	S	D	N

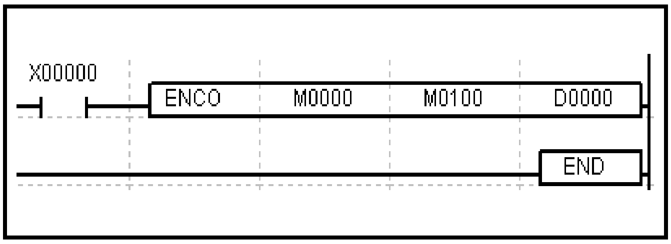
Applicable model

LP-S044, LP-S070

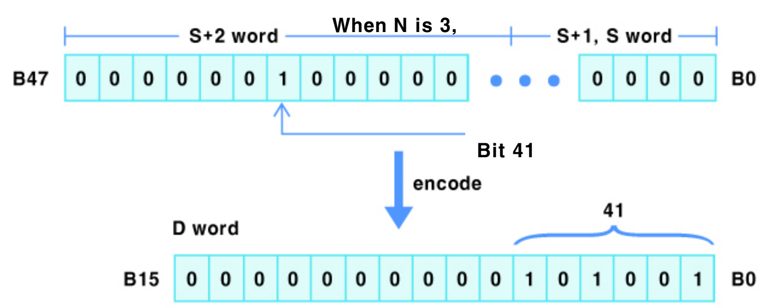
OP	DATA type	Available device / Description / Range
S	WORD	X, Y, M, S, T, C, D, Z, F, UW
		Data address to execute the encoder operation
		0(h0000) to 65535(hFFFF)
D	WORD	Y, M, S, T, C, D, Z, F, UW
		Address to save the operation result
		0(h0000) to 65535(hFFFF)
N	WORD	X, Y, M, S, T, C, D, Z, F, UW, integer
		The number of words to be encoded
		0 to 8

Error	Zero	Carry	Borrow	Step
◎	◎			7

<Ladder>



1. Encodes the number of N words from S to N and stores them into the D.
2. If the N is not in the range from 0 to 8, error flag is SET.
3. If the encoded value is 0, zero flag is SET.
4. If N is 0, it does not execute the instruction.



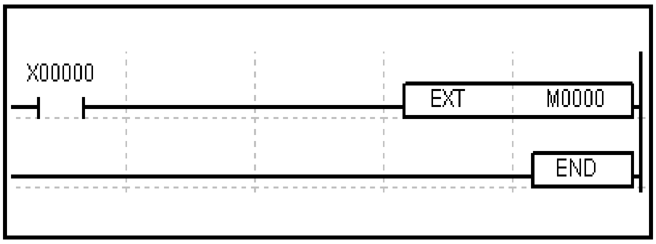
3.2.211 Data conversion instruction(EXT)

Data conversion instruction	EXT	D	Applicable model
			LP-S044, LP-S070

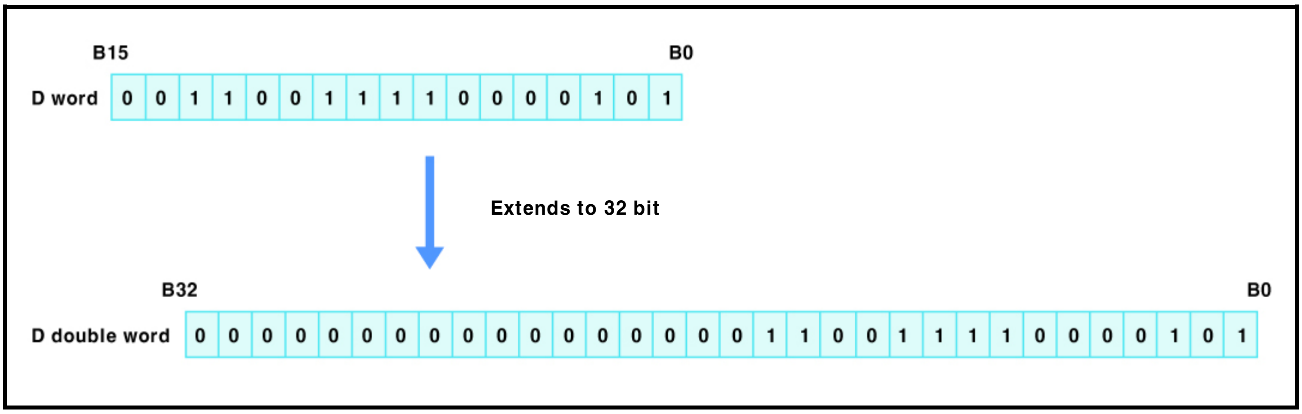
OP	DATA type	Available device / Description / Range
D	INT	Y, M, S, D, UW
		Data address to execute the operation
		-32768(h8000) to 32767(h7FFF)

Error	Zero	Carry	Borrow	Step
				3

<Ladder>



1. Extends the value of D word to 32bit.
2. Executes the Signed operation.



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3.2.212 Refresh instruction(REF)

Refresh instruction	REF	D	N

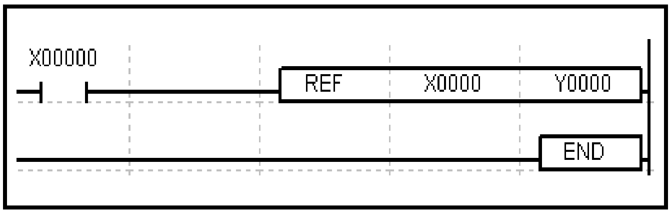
Applicable model

LP-S044, LP-S070

OP	DATA type	Available device / Description / Range
D	BIT	X, Y
		Input/Output bit device
		Not applicable
N	WORD	X, Y, M, S, T, C, D, Z, F, UW, integer
		The number of bit devices to refresh from D bit
		0 to 65535

Error	Zero	Carry	Borrow	Step
				5

<Ladder>



Refreshes the number of N bit devices beginning with I/O D bit device.

3.2.213 Display instruction(SEG)

Display instruction SEG S D N

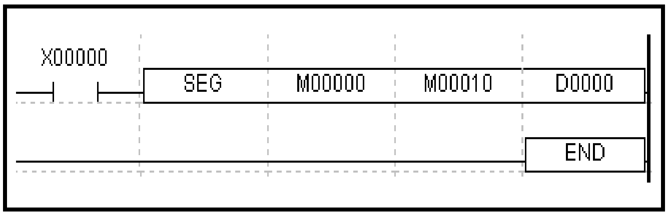
Applicable model

LP-S044, LP-S070

OP	DATA type	Available device / Description / Range
S	BIT	X, Y, M, UB
		Address which saves the data to be decoded as 7 segment
		Not applicable
D	BIT	Y, M, UB
		Address to save the decoded data
		Not applicable
N	WORD	X, Y, M, S, T, C, D, Z, F, UW, integer\
		The number of data to be decoded

Error	Zero	Carry	Borrow	Step
				7

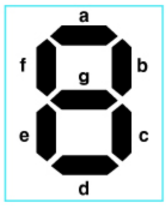
<Ladder>



Decodes the number of N data composed of 4 bit per each to the 7 segment data, one by one, and stores it as the number of N data composed of 8 bit per each.

[Segment structure]

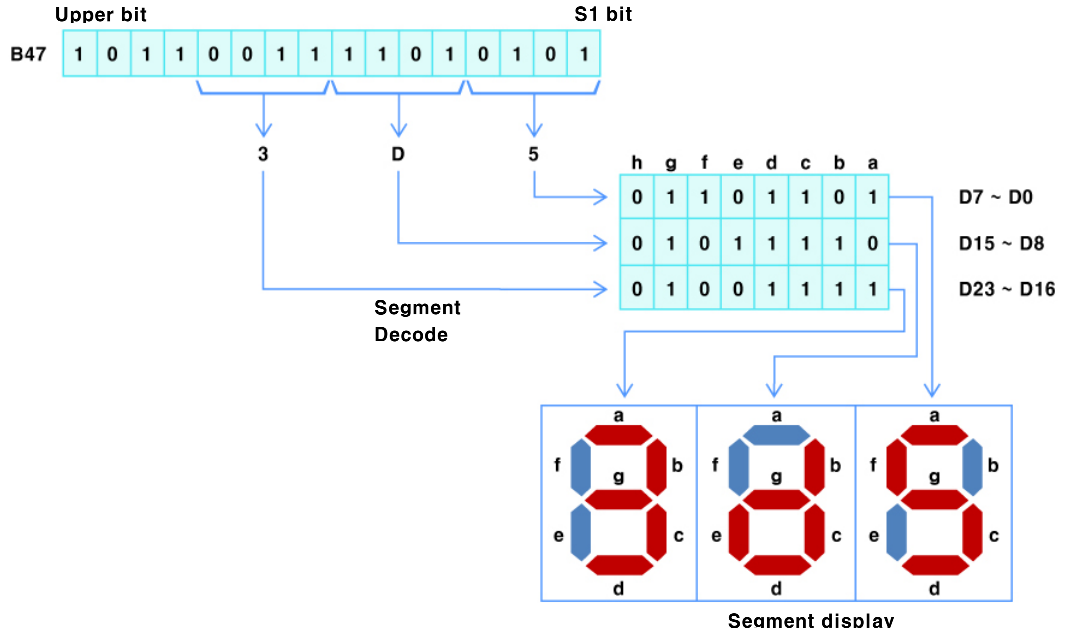
Segment structure



Segment data decode

4 input bit		DECODE								Segment display
Hex.	Bit	h	g	f	e	d	c	b	a	
0	0000	0	0	1	1	1	1	1	1	0
1	0001	0	0	0	0	0	1	1	0	1
2	0010	0	1	0	1	1	0	1	1	2
3	0011	0	1	0	0	1	1	1	1	3
4	0100	0	1	1	0	0	1	1	0	4
5	0101	0	1	1	0	1	1	0	1	5
6	0110	0	1	1	1	1	1	0	1	6
7	0111	0	0	1	0	0	1	1	1	7
8	1000	0	1	1	1	1	1	1	1	8
9	1001	0	1	1	0	0	1	1	1	9
A	1010	0	1	1	1	0	1	1	1	A
B	1011	0	1	1	1	1	1	0	0	B
C	1100	0	0	1	1	1	0	0	1	C
D	1101	0	1	0	1	1	1	1	0	D
E	1110	0	1	1	1	1	0	0	1	E
F	1111	0	1	1	1	0	0	0	1	F

Ex) When N is 3



[The structure when connectting AUTONICS display unit]

Display		Negative logic input						Postive logic input					
Hex.	Dec.	S+3BIT	S+2BIT	S+1BIT	S BIT	BI	LATCH	S+3BIT	S+2BIT	S+1BIT	S BIT	BI	LATCH
Zero Blank	Zero Blank	1	1	1	1	1	1	0	0	0	0	1	0
0	0	1	1	1	1	0	1	0	0	0	0	0	0
1	1	1	1	1	0	×	1	0	0	0	1	×	0
2	2	1	1	0	1	×	1	0	0	1	0	×	0
3	3	1	1	0	0	×	1	0	0	1	1	×	0
4	4	1	0	1	1	×	1	0	1	0	0	×	0
5	5	1	0	1	0	×	1	0	1	0	1	×	0
6	6	1	0	0	1	×	1	0	1	1	0	×	0
7	7	1	0	0	0	×	1	0	1	1	1	×	0
8	8	0	1	1	1	×	1	1	0	0	0	×	0
9	9	0	1	1	0	×	1	1	0	0	1	×	0
A	Blank	0	1	0	1	×	1	1	0	1	0	×	0
B	Blank	0	1	0	0	×	1	1	0	1	1	×	0
C	Blank	0	0	1	1	×	1	1	1	0	0	×	0
D	Blank	0	0	1	0	×	1	1	1	0	1	×	0
E	Blank	0	0	0	1	×	1	1	1	1	0	×	0
F	Blank	0	0	0	0	×	1	1	1	1	1	×	0
HOLD		×	×	×	×	×	0	×	×	×	×	×	H

"X" : It does not matter whether you input HIGH or LOW level signal.

Blank: It does not display anything even if you input the signal by using input data.

If you connect BI terminal to the VCC(HIGH level)D, it executes the Zero blanking, and if you connect BI terminal to the GND(LOW level) terminal, it displays 0.

*AUTONICS display unit has embedded DECODER DRIVER, therefore you can use S bit without D(Destination) bit.

3.2.214 Clock instruction(TCMP)

Clock instruction	TCMP	S1	S2	S3	S4	D

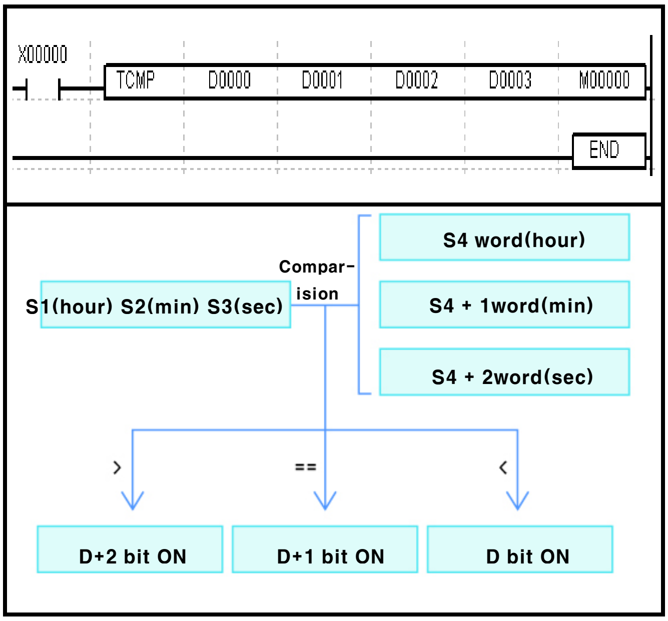
Applicable model

LP-S044, LP-S070

OP	DATA type	Available device / Description / Range
S1	WORD	X, Y, M, S, T, C, D, Z, F, UW, integer
		Device address which saves the data to be compared with 'hour' data of S4
		0(h0000) to 23(h0017)
S2	WORD	X, Y, M, S, T, C, D, Z, F, UW, integer
		Device address which saves the data to be compared with 'minute' data of S4
		0(h0000) to 59(h0038)
S3	WORD	X, Y, M, S, T, C, D, Z, F, UW, integer
		Device address which saves the data to be compared with 'second' data of S4
		0(h0000) to 59(h0038)
S4	WORD	X, Y, M, S, T, C, D, Z, F, UW
		Device address which saves the data to be compared with the data of S1, S2 and S3.
		Time data range
D	BIT	Y, M, S, T, C, Z, F, UB
		Bit device address to save the comparision result
		Not applicable

Error	Zero	Carry	Borrow	Step
◎				7

<Ladder>



Compares a data composed of S1(hour), S2(minute), and S3(second) with a data composed of S4 to S4+2 word, andas a result;

1. If the two values are equal, D bit turns ON.
2. If S4 is less than the former, D+1 bit turns ON.
3. If S4 is larger than the former, D+2 bit turns ON.
4. If S4 value is read as TRD instruction and available.
5. If the input value is not time data (hour:0 to 23, minute:0 to 59, second:0 to 59) error flag is SET.

3.2.215 Clock instruction(TADD)

Clock instruction	TADD	S1	S2	D

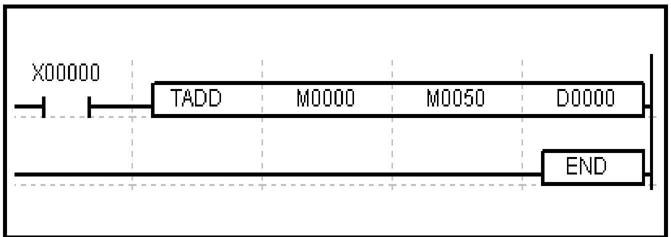
Applicable model

LP-S044, LP-S070

OP	DATA type	Available device / Description / Range
S1	WORD	X, Y, M, S, T, C, D, Z, F, UW
		Device address which saves the data to execute the time addition operation with S2
		Time data range
S2	WORD	X, Y, M, S, T, C, D, Z, F, UW
		Device address which saves the data to execute the time addition operation with S1
		Time data range
D	WORD	Y, M, S, T, C, D, Z, F, UW
		Address to save the operation result
		Time data range

Error	Zero	Carry	Borrow	Step
◎		◎		7

<Ladder>



1. Executes the addition operation for each word of S1 device, in which S1(hour), S1+1(minute), or S1+2(second), is stored, and the corresponding word of S2 device, in which S2(hour), S2+1(minute), or S2+2(second) is stored, and store the result into the designated word of D device respectively.
2. If the time exceeds 24 o'clock, carry flag occurs and the data is stored from 0 again.
3. If the input value is not time data (hour:0 to 23, minute:0 to 59, second:0 to 59) error flag is SET.

(Note) Recognizes and displays the data as binary value.

S1 word(hour)	+	S2 word(hour)	→	D word(hour)
S1 + 1word(min)	+	S2 + 1word(min)	→	D + 1word(min)
S1 + 2word(sec)	+	S2 + 2word(sec)	→	D + 2word(sec)

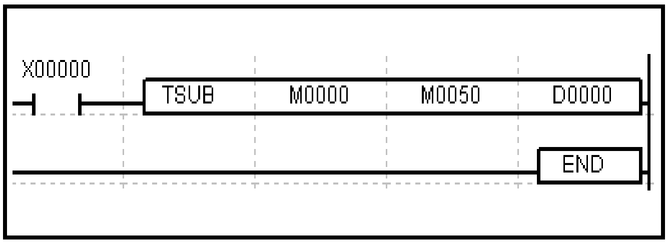
3.2.216 Clock instruction(TSUB)

Clock instruction	TSUB	S1	S2	D	Applicable model LP-S044, LP-S070

OP	DATA type	Available device / Description / Range
S1	WORD	X, Y, M, S, T, C, D, Z, F, UW
		Device address which saves the data to execute the time subtraction operation with S2
		Time data range
S2	WORD	X, Y, M, S, T, C, D, Z, F, UW
		Device address which saves the data to execute the time subtraction operation with S1
		Time data range
D	WORD	Y, M, S, T, C, D, Z, F, UW
		Address to save the operation result
		Time data range

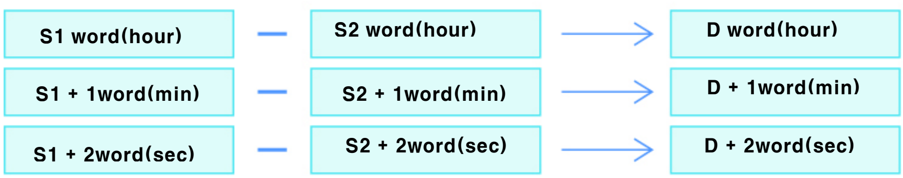
Error	Zero	Carry	Borrow	Step
◎	◎		◎	7

<Ladder>



1. Executes the subtraction operation for each word of S1 device, in which S1(hour)/S1+1(minute)/S1+2 (second) is stored, and the corresponding word of S2 in which S2(hour), S2+1(minute) orS2+2 (second) is stored, and then stores the result into the designated word of D device.
2. If the time is less than 0 o'clock, borrow flag occurs and stores the result after converting into 24-hour data.
3. If the input value is not time data (hour:0 to 23, minute:0 to 59, second:0 to 59) error flag is SET.

(Note) Recognizes and displays the data as binary value.

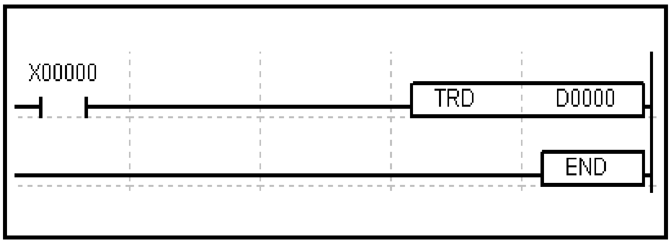


3.2.217 Clock instruction(TRD)

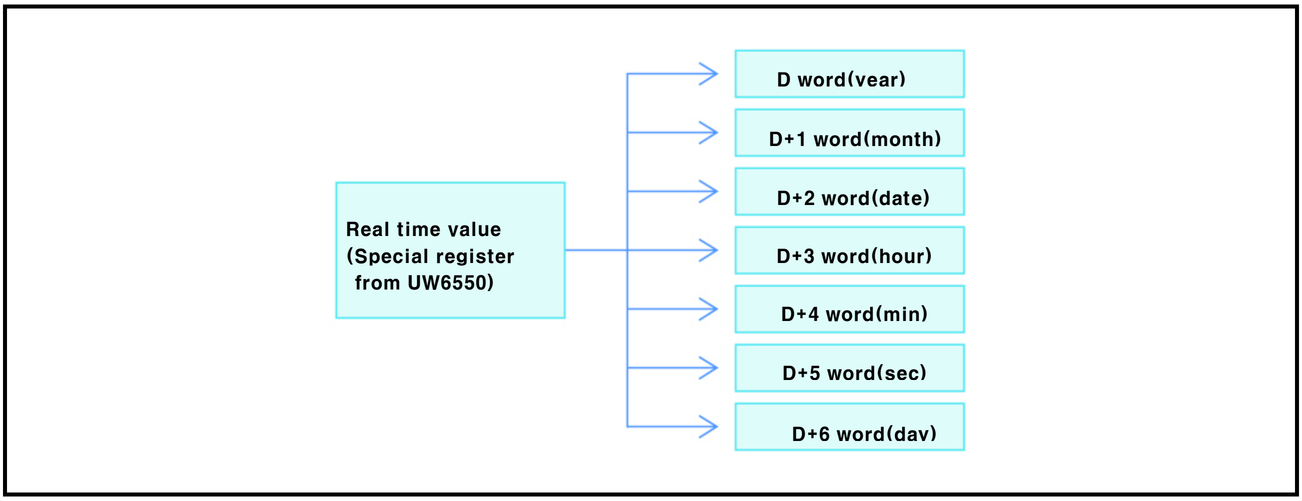
Clock instruction	TRD	D	Applicable model LP-S044, LP-S070

OP	DATA type	Available device / Description / Range	Error	Zero	Carry	Borrow	Step
D	WORD	Y, M, S, T, C, D, Z, F, UW					
		Device address to save the real time value					
		Not applicable					3

<Ladder>



The real time value is stored as below.
1. Year in D word
2. Month in D+1 word
3. Date in D+2 word
4. Hour in D+3 word
5. Minute in D+4 word
6. Second in D+5 word
7. Day of week in D+6 word



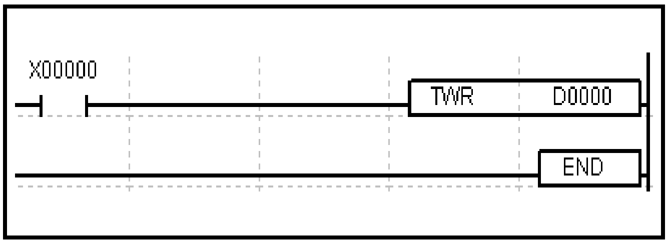
3.2.218 Clock instruction(TWR)

Clock instruction	TWR	D	Applicable model LP-S044, LP-S070

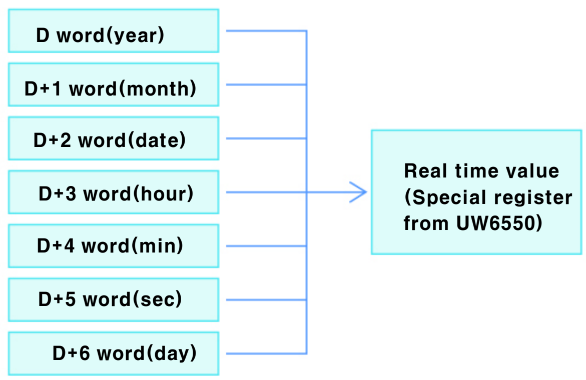
OP	DATA type	Available device / Description / Range
D	WORD	Y, M, S, T, C, D, Z, F, UW
		Device address which saves the time data to write on special register
		Time data range

Error	Zero	Carry	Borrow	Step
				3

<Ladder>



1. Year in D word
2. Month in D+1 word (1 to 12)
3. Date in D+2 word (1 to 31)
4. Hour in D+3 word (1 to 23)
5. Minute in D+4 word (1 to 59)
6. Second in D+5 word (1 to 59)
7. Day of week in D+6 word (0-sunday to 6-saturday) are stored respectively.
8. Stores the time value into the corresponding position of special register.
9. The special register (time setting) is also been running along with executing TWR instruction.
10. If the input data is out of the valid time range, error flag occurs.



3.2.219 Clock instruction(HOUR)

Clock instruction	HOUR	S	D1	D2

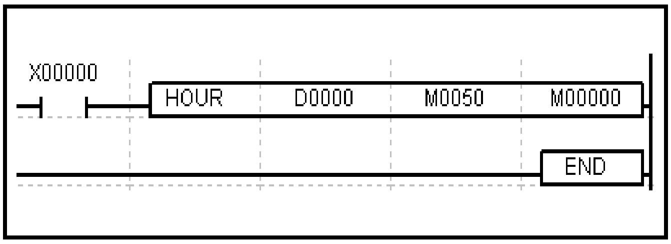
Applicable model

LP-S044, LP-S070

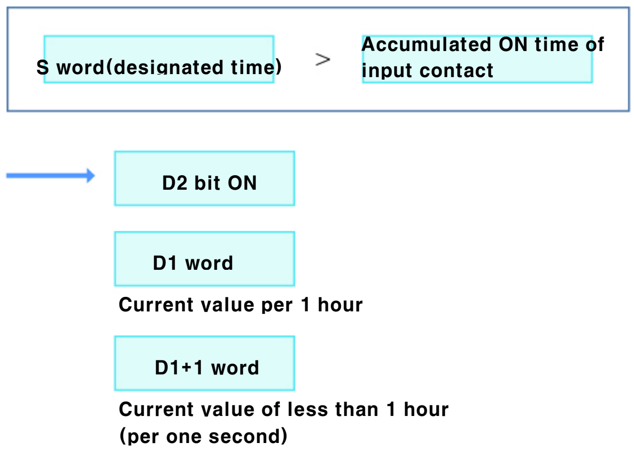
OP	DATA type	Available device / Description / Range
S	WORD	X, Y, M, S, T, C, D, Z, F, UW, integer
		Data device address to designate the accumulated time
		0(h0000) to 65535(hFFFF)
D1	WORD	Y, M, S, T, C, D, Z, F, UW
		Data device address which saves the executed time value
		0(h0000) to 65535(hFFFF)
D2	BIT	Y, M, UB
		The compared result between the executed time (D1) and the designated accumulated time(S)
		Not applicable

Error	Zero	Carry	Borrow	Step
				7

<Ladder>



1. If the input contact retains ON status for the designated time (time unit) in S word device, D2 bit turns ON.
2. The ON time value in D1 word device
3. The current value of less then 1 hour is displayed in D1+1 word device at per one second.



3.2.220 Clock instruction(TZCP)

Clock instruction TZCP S1 S2 S3 D

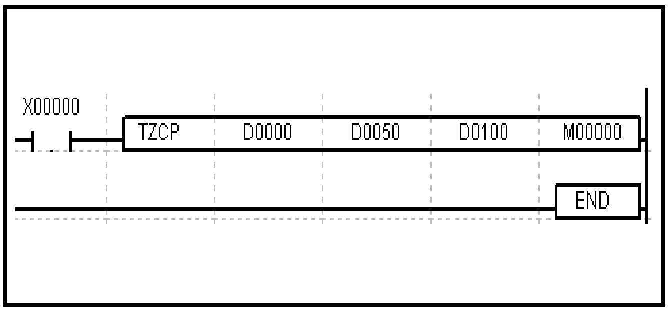
Applicable model

LP-S044, LP-S070

OP	DATA type	Available device / Description / Range
S1	WORD	X, Y, M, S, T, C, D, Z, F, UW
		Device address which saves the data to compare with S2 and S3 data
		Time data range
S2	WORD	X, Y, M, S, T, C, D, Z, F, UW
		Device address which saves the data to compare with S1 and S3 data
		Time data range
S3	WORD	X, Y, M, S, T, C, D, Z, F, UW
		Device address which saves the data to compare with S1 and S2 data
		Time data range
D	BIT	Y, M, S, T, C, Z, F, UB
		Bit device address to save comparision result
		Not applicable

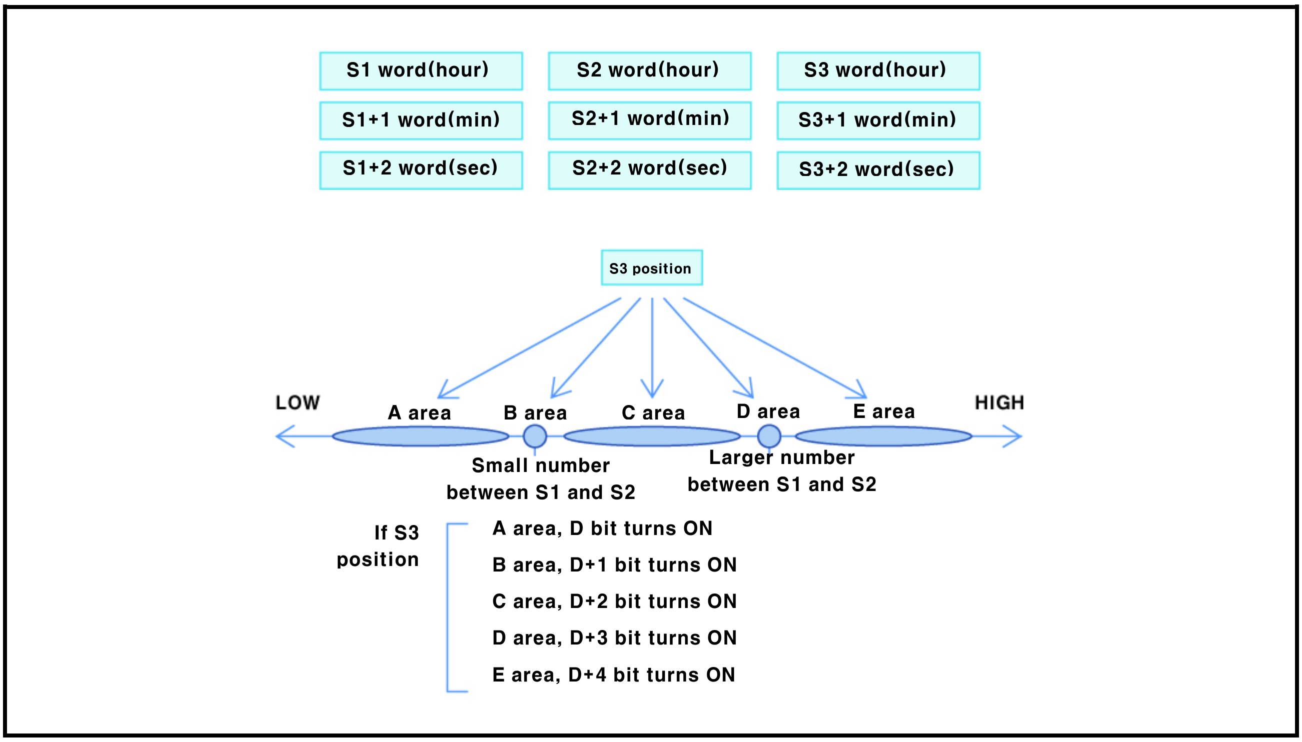
Error	Zero	Carry	Borrow	Step
◎				9

<Ladder>



Hour in S1 word, minute in S1+1 word, second in S1+2 word,
hour in S2 word, minute in S2+1 word, second in S2+2 word,
hour in S3 word, minute in S3+1 word, second in S3+2 word,
are stored respectively and compares the S3 device value between S1 device and S2 device. As a result:

1. If S3 value is less than S1 and S2 value, D bit turns ON.
2. If S3 value is equal to the smaller value of S1 or S2, D+1 bit turns ON.
3. If S3 value is between the values of S1 value and S2 value, D+2 bit turns ON.
4. If S3 value is equal to the bigger value of S1 or S2, D+3 bit turns ON.
5. If S3 value is larger than S1 value and S2 value, D+4 bit turns ON.
6. If the source data is out of the time range (hour: 0 to 23, min: 0 to 59, sec: 0 to 59), error flag occurs.


S1 word(hour)
S1+1 word(min)
S1+2 word(sec)
S2 word(hour)
S2+1 word(min)
S2+2 word(sec)
S3 word(hour)
S3+1 word(min)
S3+2 word(sec)
S3 position
LOW
A area
B area
C area
D area
E area
HIGH
Small number between S1 and S2
Larger number between S1 and S2
If S3 position
A area, D bit turns ON
B area, D+1 bit turns ON
C area, D+2 bit turns ON
D area, D+3 bit turns ON
E area, D+4 bit turns ON

3.2.221 Motion instruction(MTVDM)

Motion instruction **MTVDM** **S S1 S2 S3 S4 S5**

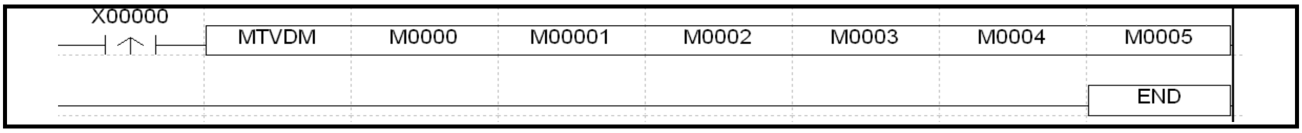
Applicable model

LP-S070

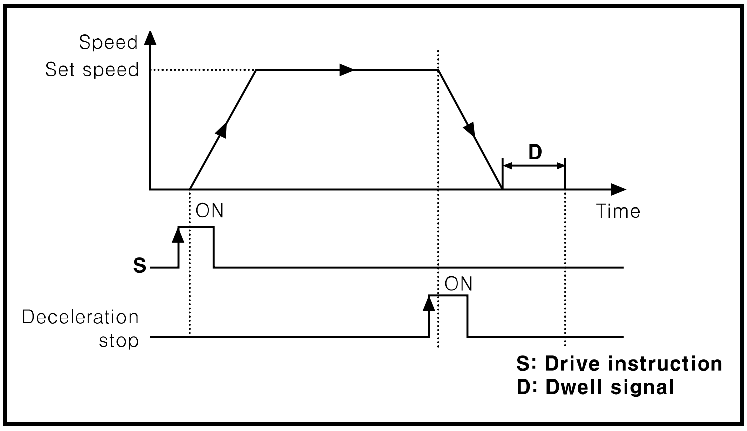
OP	DATA type	Available device / Description / Range
S	WORD	X, M, D, Z, UW, integer
		Channel(Ch1, Ch2)
		1 to 2
S1	BIT	X, M, Z, UB
		Motion drive direction
		1: Forward, 0: Backword
S2	DWORD	X, M, D, Z, UW, integer
		Drive speed
		0 to 100,000
S3	WORD	X, M, D, Z, UW, integer
		Dwell time
		0 to 65536ms
S4	WORD	X, M, D, Z, UW, integer
		Acceleration time
		Select acceleration time 1 to 5 in common configuration
S5	WORD	X, M, D, Z, UW, integer
		Deceleration time
		Select deceleration time 1 to 5 in common configuration

Error	Zero	Carry	Borrow	Step
◎				9

<Ladder>



Speed direct drive instruction: You can designate direct drive data(drive speed, drive direction, etc) directly and it executes speed drive.



[Note]

1. For utilize direct instruction, set 'TRUE' at 'Enable Ch' of common configuration from [Parameter]-[MOTION]tab in SmartStudio.
2. Select accel/deceleration time 1 to 5 in common configuration from [Parameter]-[MOTION]tab in SmartStudio.
3. You should check whether the correspond channel is using or not before using direct drive instruction.
4. If using channel is input the other instruction, using channel error occurs.

※ For more information, refer to Motion of SmartStudio user manual.

3.2.222 Motion instruction(MTPDM)

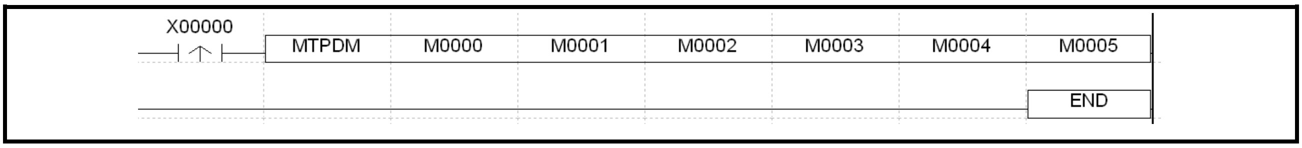
Motion instruction	MTPDM	S	S1	S2	S3	S4	S5

Applicable model: LP-S070

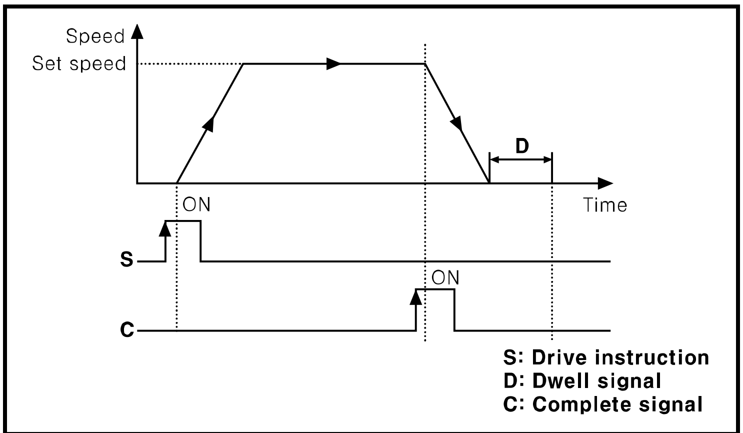
OP	DATA type	Available device / Description / Range
S	WORD	X, M, D, Z, UW, integer
		Channel (Ch1, Ch2)
		1 to 256
S1	DWORD	X, M, D, Z, UW, integer
		Target position
		-2,147,483,648 to 2,147,483,647 (Enable to set the range)
S2	DWORD	X, M, D, Z, UW, integer
		Drive speed
		0 to 100,000
S3	WORD	X, M, D, Z, UW, integer
		Dwell time
		0 to 65536ms
S4	WORD	X, M, D, Z, UW, integer
		Acceleration time
		Select acceleration time 1 to 5 in common configuration
S5	WORD	X, M, D, Z, UW, integer
		Deceleration time
		Select deceleration time 1 to 5 in common configuration

Error	Zero	Carry	Borrow	Step
◎				9

<Ladder>



Position direct drive instruction: You can designate direct drive data(drive speed, drive direction, etc) directly and it executes position drive.



[Note]

1. For utilize direct instruction, set ‘TRUE’ at ‘Enable Ch’ of common configuration from [Parameter]-[MOTION]tab in SmartStudio.
2. Select accel/deceleration time 1 to 5 in common configuration from [Parameter]-[MOTION]tab in SmartStudio.
3. You should check whether the correspond channel is using or not before using direct drive instruction.
4. If using channel is input the other instruction, using channel error occurs.

※ For more information, refer to Motion of SmartStudio user manual.

3.2.223 Motion instruction(MTIDM)

Motion instruction **MTIDM** **S** **S1**

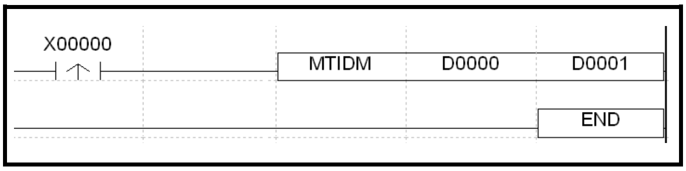
Applicable model

LP-S070

OP	DATA type	Available device / Description / Range
S	WORD	X, M, D, Z, UW, integer
		Channel(Ch1, Ch2)
		1 to 2
S1	WORD	X, M, D, Z, UW, integer
		Step number
		1 to 99

Error	Zero	Carry	Borrow	Step
◎				5

<Ladder>



Indirect designate drive instruction: It operates with the number of scripted string in the specified pattern from pattern list.

[Note]

1. For utilize indirect drive instruction, set 'TRUE' at 'Enable Ch' of common configuration from [Parameter]-[MOTION]tab in SmartStudio.
2. There should be pattern number to execute of pattern list from from [Parameter]-[MOTION]tab in SmartStudio.
3. You should check whether the correspond channel is using or not before using drive instruction.

[Pattern stop method]

1) F400 or F402 (Action list stop) + MTSRS

: During pattern drive, if currently executed action list type is speed drive and this instruction is executed, speed drive is finish and it executes the next action list.

2) F401 or F403 (Group stop) + MTSRS

: During group drive, this instruction is executed, it escapes the group and executes the other action list following the group.

3) Not to set special flag

: Pattern drive is finish.

※ For more information, refer to Motion of SmartStudio user manual.

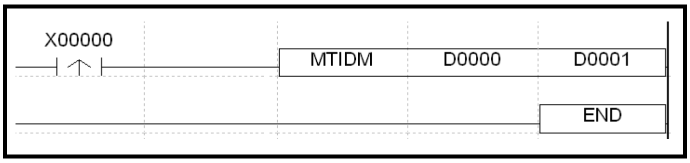
3.2.224 Motion instruction(MTMEC)

Motion instruction	MTMEC	S	Applicable model LP-S070

OP	DATA type	Available device / Description / Range
S	WORD	X, M, D, Z, UW, integer
		Channel(Ch1, Ch2)
		1 to 2

Error	Zero	Carry	Borrow	Step
◎				5

<Ladder>



Error remove instruction: This instruction removes the error when error flag occurs by error during motion drive.

※ For more information, refer to Motion of SmartStudio user manual.

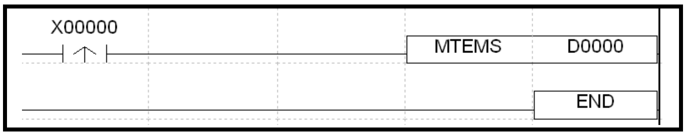
3.2.225 Motion instruction(MTEMS)

Motion instruction	MTEMS	S	Applicable model
			LP-S070

OP	DATA type	Available device / Description / Range
S	WORD	X, M, D, Z, UW, integer
		Channel(Ch1, Ch2)
		1 to 2

Error	Zero	Carry	Borrow	Step
◎				5

<Ladder>



Emergency stop instruction: If there is emergency during motion position driving, you can stop all motion actions by emergency stop instruction.

[Note]
When executing emergency stop instruction, all currently executing motion instructions stop.

※ For more information, refer to Motion of SmartStudio user manual.

3.2.226 Motion instruction(MTCPP)

Motion instruction	MTCPP	S	S1

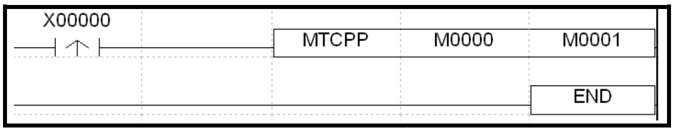
Applicable model

LP-S070

OP	DATA type	Available device / Description / Range
S	WORD	X, M, D, Z, UW, integer
		Channel(Ch1, Ch2)
		1 to 2
S1	DWORD	X, M, D, Z, UW, integer
		Setting value of new position
		-2,147,483,648 to 2,147,483,647

Error	Zero	Carry	Borrow	Step
◎				5

<Ladder>



Current position preset instruction: This motion instruction is for re-set the current position.

[Note]
During motion driving, if this instruction is executed, error occurs.

※ For more information, refer to Motion of SmartStudio user manual.

3.2.227 Motion instruction(MTFOS)

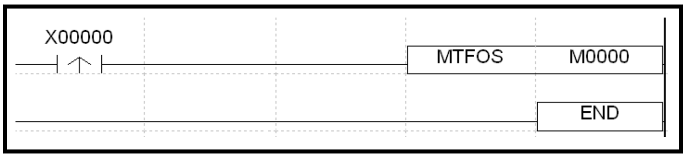
Motion instruction	MTFOS	S

Applicable model: LP-S070

OP	DATA type	Available device / Description / Range
S	WORD	X, M, D, Z, UW, integer
		Channel(Ch1, Ch2)
		1 to 2

Error	Zero	Carry	Borrow	Step
◎				5

<Ladder>



Forced home setting instruction: This instruction sets the specified position as the set home position value in SmartStudio.

※ For more information, refer to Motion of SmartStudio user manual.

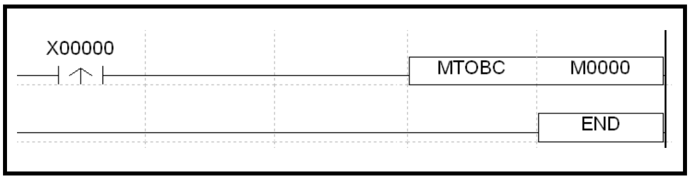
3.2.228 Motion instruction(MTSRS)

Motion instruction	MTSRS	S	Applicable model
			LP-S070

OP	DATA type	Available device / Description / Range
S	WORD	X, M, D, Z, UW, integer
		Channel(Ch1, Ch2)
		1 to 2

Error	Zero	Carry	Borrow	Step
◎				5

<Ladder>



Normal stop instruction: It executes normal stop instruction to the currently motion driving channel.

[Pattern stop method with combinating special flag]

1. F400 or F402 (Action list stop) + MTSRS
   : During pattern drive, if currently executed action list type is speed drive and this instruction is executed, speed drive is finish and it executes the next action list.

2. F401 or F403 (Group stop) + MTSRS
   : During group drive, this instruction is executed, it escapes the group and executes the other action list following the group.

3. Not to set special flag
   : Pattern drive is finish.

4. MTSRS during linear interpolation drive
   : Two axies deceleratey stop at the same time.

※ For more information, refer to Motion of SmartStudio user manual.

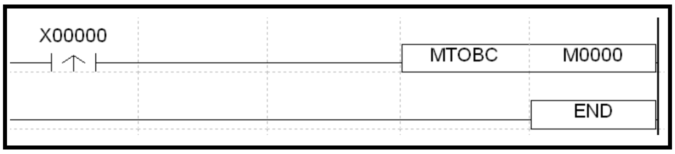
3.2.229 Motion instruction(MTOBC)

Motion instruction	MTOBC	S	Applicable model
			LP-S070

OP	DATA type	Available device / Description / Range
S	WORD	X, M, D, Z, UW, integer
		Channel(Ch1, Ch2)
		1 to 2

Error	Zero	Carry	Borrow	Step
◎				5

<Ladder>

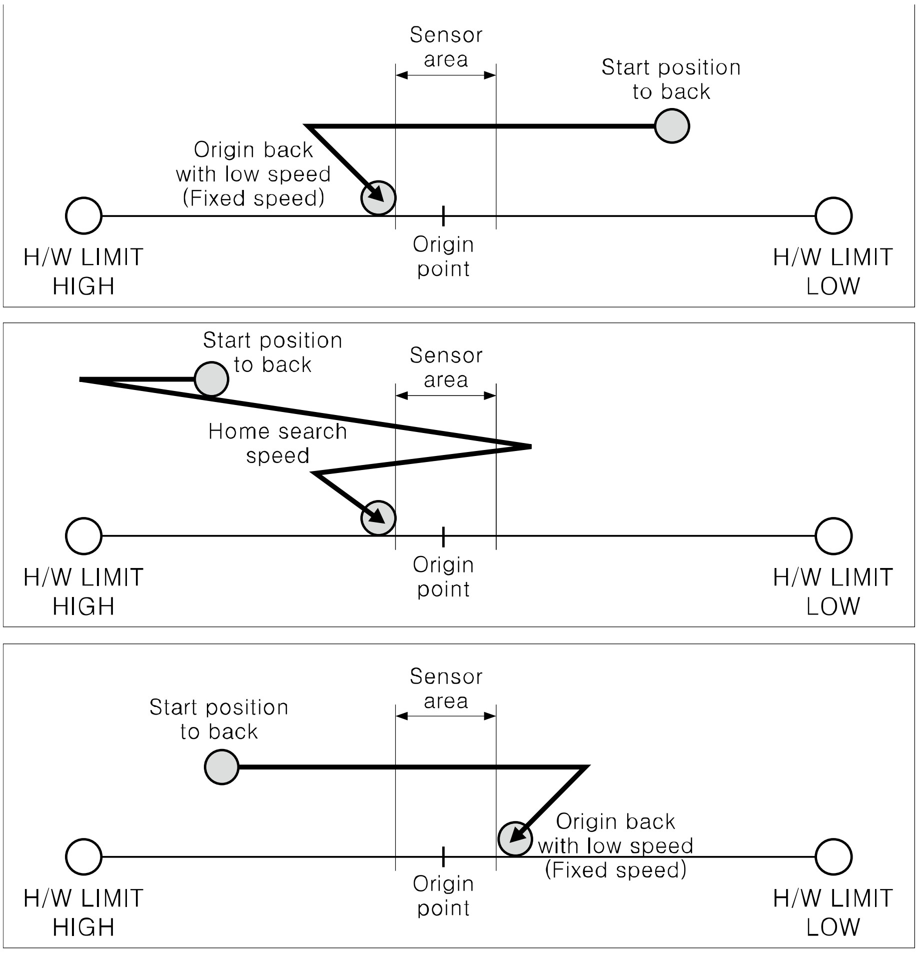


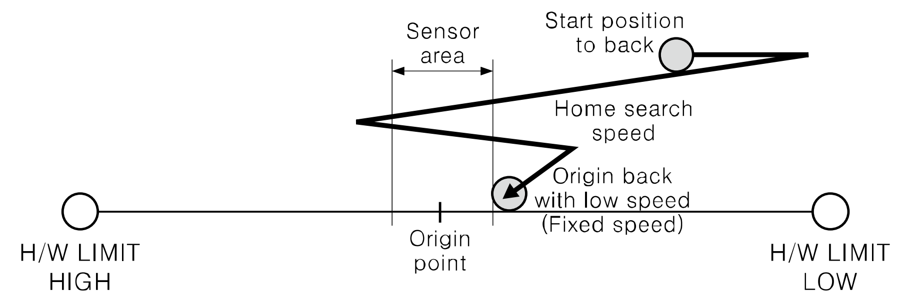
Origin back instruction: During motion position drive, if you want to return to origin, it goes back to the preset origin point.

LP-S070 has two methods for returning the origin.

- H/W origin back: It is the origin back method by home search direction, upper/lower H/W limit, and home sensing which are set in SmartStudio.
  S/W origin back: It is the origin back method to move directly to the known origin by S/W.

[Origin back type by home search direction during H/W origin back]





The position of the origin point is set in SmartStudio.

※ For more information, refer to Motion of SmartStudio user manual.

3.2.230 Motion instruction(MTOVV)

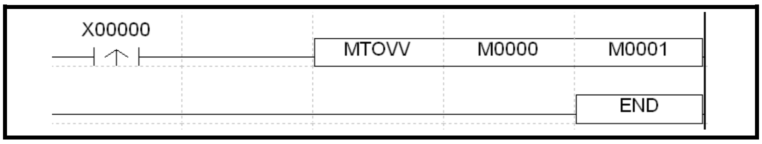
Motion instruction **MTOVV** **S** **S1**

Applicable model
LP-S070

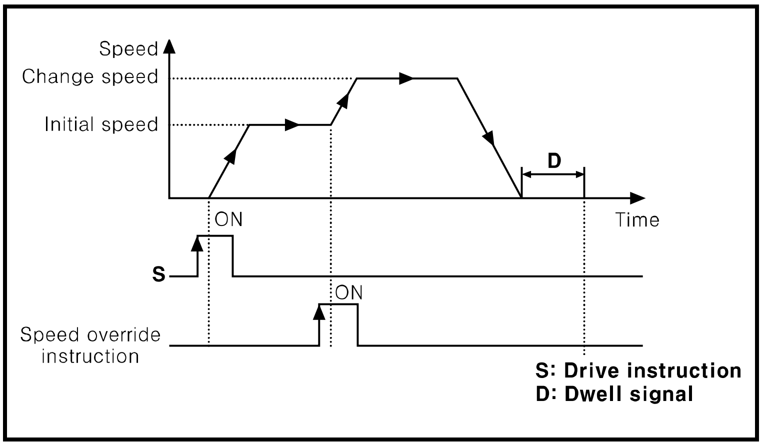
OP	DATA type	Available device / Description / Range
S	WORD	X, M, D, Z, UW, integer
		Channel(Ch1, Ch2)
		1 to 2
S1	DWORD	X, M, D, Z, UW, integer
		Drive speed
		0 to 100kpps

Error	Zero	Carry	Borrow	Step
◎				5

<Ladder>



Speed overide: It converts the currently operating speed set (unit set) to the other speed and operates with the converted speed.



1. Operating speed >> Chagned speed: It converts to changed speed and operates with the changed speed.
2. Operating speed ≦ Changed speed: It converts to changed speed and operates with the changed speed.
3. Changed speed < Initial speed: When changing speed to the slower than initial speed, it operates constant speed drive without accel/deceleration.

[Note]
1. If the currently not operated channel is executed this instruction, position/speed override change error occurs.
2. If the currently operated channel is executed the other instruction, enable channel error occurs.
3. Be sure that rapid speed changing may cause the pull-out of motor.

※ For more information, refer to Motion of SmartStudio user manual.

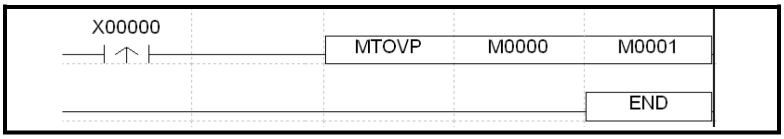
3.2.231 Motion instruction(MTOVP)

Motion instruction	MTOVP	S	S1	Applicable model: LP-S070

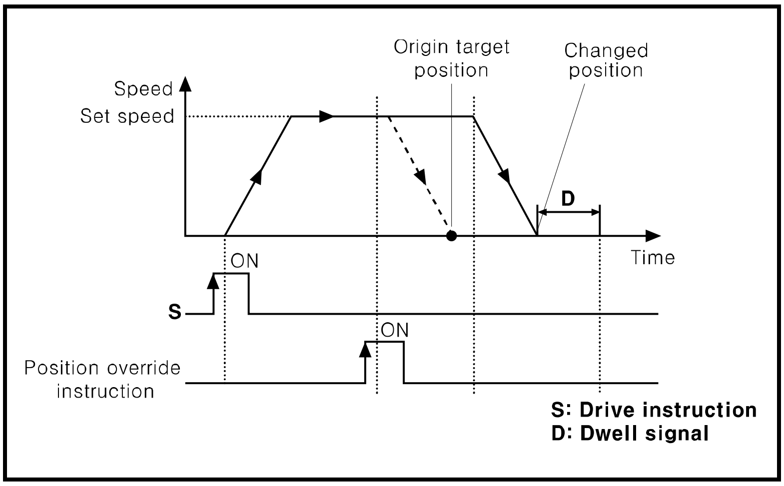
OP	DATA type	Available device / Description / Range
S	WORD	X, M, D, Z, UW, integer
		Channel(Ch1, Ch2)
		1 to 2
S1	WORD	X, M, D, Z, UW, integer
		Changed position
		-2147483647 to 2147483647

Error	Zero	Carry	Borrow	Step
◎				5

<Ladder>



Position override:. It changes the set target position to the designated position by the instruction.



1. Current position≧ Changed position: It stops with deceleration.

2. Current position << Changed position: It stops with deceleration at the changed position.

[Note]
1. If the currently not operated channel is executed this instruction, position/speed override change error occurs.
2. If the currently operated channel is executed the other instruction, enable channel error occurs.

※ For more information, refer to Motion of SmartStudio user manual.

3.2.232 Motion instruction(MTIPT)

Motion instruction	MTIPT	S	S1	S4	S4

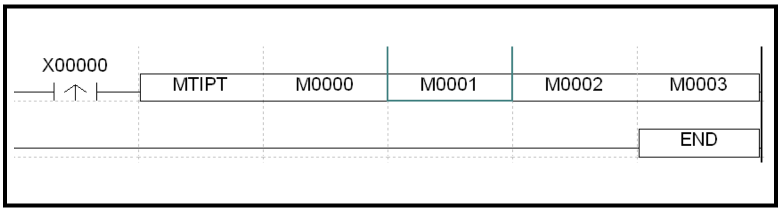
Applicable model

LP-S070

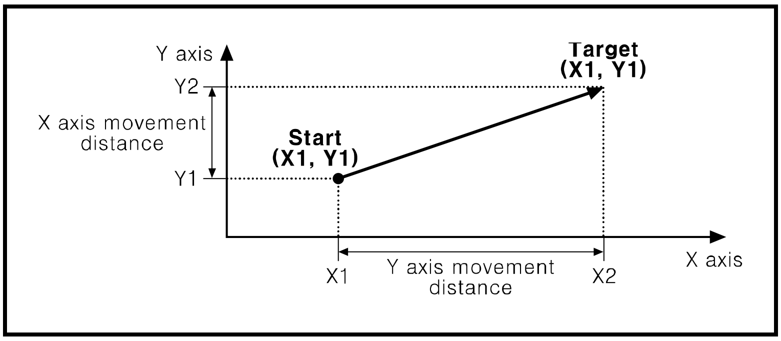
Error	Zero	Carry	Borrow	Step
◎				7

OP	DATA type	Available device / Description / Range
S	WORD	Integer
		Channel number of the first axis(Ch1, Ch2)
		1 to 2
S1	WORD	X, M, D, Z, UW, integer
		Action number of the first axis(it is not pattern number)
		0 to 65535
S3	WORD	Integer
		Channel number of the second axis (Ch0, Ch1)
		1 to 2
S4	WORD	X, M, D, Z, UW, integer
		Action number of the second axis(it is not pattern number)
		0 to 65535

<Ladder>



Line interpolation instruction: It executes line interpolation drive with two axes.



[Note]

1. The action list designated as speed drive is not available as the axis between line interpolation.
2. The axis which is more distance than the other is set as main axis.
3. Drive data of sub axis is dicided by the calculating from the drive data of main axis.
4. If each distance of two axes is same, CH1 becomes main axis.

※ For more information, refer to Motion of SmartStudio user manual.

3.2.233 Motion instruction(MTUAI)

Motion instruction **MTUAI** **S** **S1**

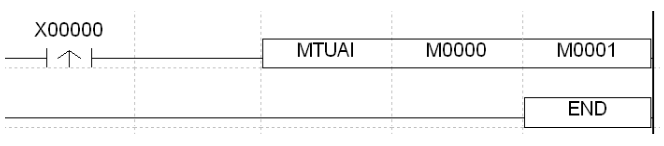
Applicable model

LP-S070

OP	DATA type	Available device / Description / Range
S	WORD	X, M, D, Z, UW, integer
		Channel(Ch1, Ch2)
		1 to 2
S1	WORD	X, M, D, Z, UW, integer
		Step number
		1 to 99

Error	Zero	Carry	Borrow	Step
◎				5

<Ladder>



Action item drive instruction
: It operates one action of motion referring the number of action item.

[Note]
1. For utilize indirect drive instruction, set ‘TRUE’ at ‘Enable Ch’ of common configuration from [Parameter]-[MOTION]tab in SmartStudio.
2. There should be pattern number to execute of pattern list from from [Parameter]-[MOTION]tab in SmartStudio.
3. If the currently operated channel is executed the other instruction, enable channel error occurs..

※ For more information, refer to Motion of SmartStudio user manual.

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