Programming Manual

Software

atLogic

V2.2.48

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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.

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Preface

Thank you for purchasing Autonics product.

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

atLogic Programming 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 website (<u>www.autonics.com</u>) 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 website.
- We contrived to describe this manual more easily and correctly. However, if there are any corrections or questions, please notify us these on our website.

atLogic Programming Manual Symbols

Symbol	Description
Note	Supplementary information for a particular feature.
Å Warning	Failure to follow instructions can result in serious injury or death.
A 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.

Reference Manual for Each Configuration



Logic panel device specification, installation, maintenance, management, firmware update and system configuration

Hardware Manual	LP-A Series User Manual

2 Project drawing, programming

Software	Drawing	atDesigner User Manual
Manual	Programming	atLogic User Manual, atLogic Programming Manual

3 Project Upload/Download

Hardware Manual LP-A Series User Manual

4 Connected device setting, communication setting

Software Menual	Drawing	atDesigner User Manual
Software Manual	Programming	atLogic User Manual, atLogic Programming Manual
Hardware Manual		LP-A Series User Manual

Check connectable device, connection cable model name and protocol

Communication Manual	GP/LP Communication Manual

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1 Overview

1.1 Feature of atLogic

atLogic is the exculsive software to write program and debug for LP series. Features and advantages of atLogic are as below.

- Support multi project
 Able to open up to 5 projects at the same time and write or edit programs.
- Convenient program edit
 - Able to edit by cell unit
 - Able to edit with multi window
 - Support several view functions such as viewing device name, variable name, or device name & comment, etc. to edit program easily.
 - Able to edit ladder program and mnemonic program at the same time.
- Several monitor function
 Support several monitor function such as monitoring variable, device, system, or time chart, etc.
- Convenient user interface
 Easy adaptation for atLogic by same basic function of Microsoft window.
- Various message window
 Supports various message window for edit or check program easily.
- Real time switching ladder and mnemonic program
 Switching ladder or mnemonic program in real time and it is available to write or edit at two editors simultaneously.

1.2 Program Structure and Operation

1.2.1 Program Structure

The program consists of all functions required to execute a specific control, and it is saved embedded RAM of CPU module or flash memory.

These functions are generally classified as below.

Function	Description
Scan Program	Processes a sign repeating regularly in every scan.
	Executes the program according to the set time interval when required to process time conditions as follows.
Time-driven	 When it is required to faster processing than an average process time for a scan
Interrupt Program	 When it is required a longer time interval than an average processing time for a scan
	\cdot When it is required to process a program in the designated time interval
Subroutine Program	Executes only when certain condition is fulfilled. (When input condition of CALL instruction is ON)

1.2.2 Program Operation

This program processes the operation according to the following procedures.



2 Create Program

2.1 **Operation Processing Procedures**

2.1.1 Basic Processing Procedures



LP program performs input refresh before starting its operation, and begins operation work from the step 0 one by one. Then it executes output refresh after performing the END instruction. Through all these procedures, finally one scan is completed.

- Refresh input: Before executing the program operation, it reads the data from the input contact or module and saves it in designated device area(X Device).
- Refresh output: After completing the program operation, it outputs the data from designated area(Y Device) to the output contact or output module.
- Refresh input and output: Refresh input and output is executed by force at the time to perform the instruction.

2.1.2 Processing Procedures when Branching

(1) When using JMP to CALL



(2) When END instruction is duplicated



If the END instruction executes while the program is being processed, it exits the operation without performing the below program.



(3) Interrupt, Subroutine, User defined functions

As above example for interrupt program, programs containing interrupt, subroutine and user defined functions, firstly jump to the subroutine and perform it completely, and then go to the main program again, finally keep continuing to execute the program from the next step of the stopped step.

2.2 Display the numerical values

(1) Decimal number

Setting values of timer and counter, addresses of word device and S device, for designate the numeral values in instruction operands, for designate the number of operation times in instruction operands Ex) 1, 3, 10, 19...

(2) Hexadecimal number

Setting values of timer and counter, addresses of bit devices such as X, Y and M, for designate the numeral values in instruction operands, for designate the number of operation times in instruction operands Ex) h0001, h0003, h000a, h0013...

(3) Binary number

Setting values of timer and counter, for designate the numeral values and the number of operation times is displayed with decimal or hexadecimal number, these kinds of numeric values are usually converted into binary numbers in LP. Ex) 0001, 0011, 1010, 00010011...

(4) BCD

BCD is a numeric system that represents the decimal digits consisted of 0 to 9 as the binary numeric system of 4 bits.

Ex) 0001, 0011, 0001 0000, 0001 1001...

2.3 Input/Output Processing



Refreshing time

No.	Description
1	Input is OFF.
2	It is not time to refresh input, input is OFF.
	It is ON at the time to refresh input, input is ON. But the length of input signal is shorter
3	than scan cycle, it may not recognize as ON depending on the time to refresh input.
	Because the input retains ON during a cycle of scan regardless of refreshing input time.
4	*The minimum input retaining time of LP series is 1ms. Even though the input is entered
	at the time of refreshing input, the input is invalid if it is not able to maintain for 1ms.

2.4 Response Delay



The program is processed as above, therefore in case of input/output the response delay may be occurred due to operation time. If you need to perform input/output processing while program is being operated, it is available with using REF instructions(Refresh input/output).

2.5 Dual Coil

2.5.1 Definition and Diagnosis of Dual Coil

(1) Definition of dual coil

Dual coil indicates that the same output coil is used in duplicate in a program.

(2) Diagnosis of dual coil

- 1) When the same device is used as operand of OUT instruction more than twice in a program.
- Not dual coil

Step	Instruction	0P1	0P2
0	LOAD	M00000	
1	OUT	M00001	
2	LOAD	M00002	
3	RST	M00001	
4	END		

• Dual coil

Step	Instruction	0P1	0P2
0	LOAD	M00000	
1	OUT	M00001	
2	LOAD	M00002	
3	OUT	M00001	
4	END		

- 2) When the same device of counter or timer is used as timer/counter instruction more than twice in a program.
- Not dual coil

Step	Instruction	0P1	OP2
0	LOAD	M00000	
1	LOAD	M00001	
2	сти	C000	100
7	LOAD	M00002	1
8	MOV	100	C000
13	END		

Dual coil

Step	Instruction	0P1	OP2
0	LOAD	M00000	
1	LOAD	M00001	
2	СТИ	C000	100
7	LOAD	M00002	
8	LOAD	M00003	
9	СТИ	C000	10
14	END		

It is not regard as dual coil when the same device is used in other instructions.

(3) Process dual coil as error

Select [Tool]-[Program Checking]-[Program Checking Options] of atLogic menu, 'Checking Program Options' dialog box appears. Check 'Process dual coil as error' and it processes dual coil as an error and you cannot download the program. If not checking 'Process dual coil as error' you can download the program.

Checking Program Options 🛛 🗙
Options
🗹 Process dual coil as error
Cance I

2.6 Pointer Use

Pointer usually refers to the same kind of device having a corresponding device value as an address. Using a pointer indicates that the asterisk mark('*') attaches in front of device in order to use it as a pointer. (ex : *M0010)

0	F00010						H0064
			 · ·		MOV	H0064	M0010
e e	F00010						H000A
0			1	MOV	H000A	*M0010	
10	F00010		1	1		H000A	H000A
12				1	MOV	*M0010	M0100
40	M00001		 				Y00000
18							
			 			r	
20	1		1				END
			 ÷				

Ex.

When as following mnemonic codes exist,

MOV *M0010 D0050

If the value 100 is stored in M0010, the above mnemonic code can be interpreted as follows.

MOV M0100 D0050

If the value 30 is stored in D0050, the above mnemonic code can be interpreted as follows.

MOV 30 D0050

2.7 **Operation Error**

If it is a numerical operation error caused by the problems, which are occurred during performing the user program, it is displayed in error flag and the system continues to operate. When the operation time is longer than the setting time for scan delay monitoring during performing the operation, the system is not operated any more.

- Time-driven operation error (F35 bit)
 When the scan time is longer than the time-driven setting time, it is SET. When the scan time is shorter than the time-driven setting time, its corresponding bit turns OFF from ON.
- Operation error flag (At present) (F68 bit)
 When an error occurs in numerical operation during performing the user program, its corresponding bit is SET. When changing to all modes excluded STOP mode and no operation error after a scan and program download and power reset, its corresponding bit turns OFF from ON.
- Operation error flag (Retaining) (F69 bit)
 It is used to figure out the history of operation error occurrences. If the first operation error occurs while scanning, the corresponding bit is SET and turns OFF when the power is reset.

2.8 Usage of User Defined Functions

This function is to reuse a block, possibly to be used in other project, by making it library while you are creating a program. The program made in library is saved as a file so that it is available to use in other projects or PC again.

User calls "user defined functions" as forms of FCALL cmd op1 op2... and uses it as forms of FUNC cmd.

(1) How to register user defined functions

1st Select the block you want to register as below.

00000-10000	X00000	X00002	X00003	X00004			Y00000	Γ
00001-L0001	M00000		-- 					
6 00002-L0002	мооооо				MOV	X0000	Y0000	

2nd Select [Tool]-[Register User Defined Function] of menu, press Shift + F10, or click

of ladder tool bar. 'Register User Defined Function' dialog box appears.

Register User Defined	Function 🔀
①Function F_	.lib(Max: 7 Words)
Operand Information	
The numbers 1	
Format D1	
Operand Information—	
D1:	•
D2:	-
D3:	•
D4:	•
D5:	•
D6:	•
D7:	•
D8:	
D9:	
D10:	
D11:	
D12:	
D13:	
D14:	
D15:	
D16:	

Q Insult a user defined function across	
U input a user defined function name.	
② Set the number of operands to use.	
Set the number of each operand's device as much as the designated	
umber of operands.	
④ Describe for the user defined functions you want to register.	

3rd If click "OK" button after completing above process, the user defined function is registered. The registered user defined function is stored with the function name.lib file in \LIB folder.

(2) How to use user defined function

1st Select [Tool]-[User Defined Function], press Ctrl + F11, or click 📴 of ladder tool bar. 'Function List' dialog box appears.

Functio	on List					
①Instru Path	C:#Program Files#Autonics#SmartStudio 2.0.0t					
2 F_213 F_456						
3 Oper- D1 D1 :	andBit Device					
(Commo	ent					
	Select Cancel					
No.	Description					
1	Displays the selected user defined function name.					
2	Displays user defined functions stored in the designated folders.					

3 Displays used device in the selected user defined function.

④ Displays registered description for the selected user defined function.

²nd User defined functions are applied when click 'Select'. If user defined function or operand is not entered correctly, and when you click 'Select', 'Function List' dialog box is not closed and user defined function is not applied to ladder program. Click 'Cancel' and the user defined functions list is closed automatically regardless of whatever you input.

3rd In the place where call the function, call with FCALL instruction, and in the place where the function is called, is called with FUNC instruction.

мооооо							Y00000
				FCALL	OUT2	X0000	Y0000
							END
FUNC	OUT2	V0000	V0001				
					MOV	V0000	V0001
			1 1 1 1 1	1 1 1 1 1			RET
		1			1		

2.9 Notice

(1) Input/Output processing and response delay



It is processing input/output through executing the above processing repeatedly. Therefore, please be aware that there is a response delay by operation cycle except by the operation time of input filter or output elements in sequence control.

(2) Dual coil

When the output coil is used in multi places, usually the last programmed coil is activated first.

```
For example,

LOAD X0

OUT Y0 (First Y0)

LOAD Y0

OUT Y1

LOAD X1

OUT Y0 (Second Y0)

In above, X0 = ON, X1= OFF.

For first Y0 is X0 = ON, virtual memory is ON and output Y1 is ON. However, second Y0 is

X1 = OFF, virtual memory turns OFF.

Therefore, actual external output is Y0 = ON, Y1 = ON. If using dual output as explained

above, the latter one is activated first. Therefore, pay attention when using dual coil. For

whether to using dual coil or not, refer to '2.5 Dual Coil'.
```

3 Device

3.1 X Device

X input device is a device that transfers the signal inputted from an external switch or a button to CPU.

It is able to use A(Normally Open) or B(Normally Closed)Contacts in the program, and also available to with pulse inputs for the contact.



X input device, which is not connected with input terminal, is able to be used as the same function as an inner auxiliary device(M Device).

Because input contact is only retained by external input, be sure that if you want to use it as an external output.

3.2 Y Device

Y output device is a device that transfers the inner processing result to externally connected output devices.



Y device, which is not connected with output terminal, is able to be used as the same function as an inner auxiliary device(M Device).

In case the output device is allocated to an actual external contact and the same output contact is used more than twice to the operand of out instruction in a program, the last used output is output to outside. For further details, refer to '2.5 Dual Coil'.

3.3 M Device

It is an inner auxiliary device of LP.

It is only able to perform in the program, not able to directly output to outside of LP. It is available to be used as a memory protection device by setting 'Device Latch Range Settings' in [Parameter]-[COMMON].

3.4 S Device

It is a step device.

It is a device to control step and used with OUT, SET and RESET instructions. When it is used with SET or RESET instruction, the previous step must be performed first to execute the current step. When it is used with OUT instruction, it executes the last step turned "On" regardless of the order of step.

It is unavailable to be used as a word device, only can be used as a bit device. It is available to be used as a memory protection device by setting 'Device Latch Range Settings' in [Parameter]-[COMMON]. The clear condition, SET XXX.00, is able to execute anytime regardless of the processing steps.

3.5 D Device

It is a data device of LP.

It is only able to be used as a word bit, not able to be used as a bit device. When it is used as the 32 bit instruction, D word is operated as lower 16 bit and D+1 word is operated as upper 16 bit as following picture.



It is available to be used as a memory protection device by setting 'Device Latch Range Settings' in [Parameter]-[COMMON].

3.6 T Device

It is a device used with instructions related to Timer.

It consists of three parts; timer contact, timer setting value, timer present value.

Timer contact performs ON/OFF functions according to the result of timer instruction and also available to be used as timer and input instructions.

Timer setting value is a place where a boundary value for the result of timer is saved, and is available to be used with timer and application instructions.

Timer present value is a place where a present value is stored while timer is operating, and user can not set it up directly.

When as following picture, if inputting 100 to "T0" setting value device, "T0" timer contact device turns ON when "T0" present value device becomes 100.



Timer instructions, related to LP Series are TON, TOFF, TMON, TRTG and TMR, and even the same timer device is operated differently depending on each instruction.

The basic cycle of timer device is 10ms, but it is available to be operated in 10ms or 100ms by setting up the device range in parameters.

It is available to be used as a memory protection device by setting 'Device Latch Range Settings' in [Parameter]-[COMMON].

For furter details of timer device, refer to '5.3.2 Timer'.

3.7 C Device

It is a device used with the instructions related to Counter.

It consists of three parts; counter contact, counter setting value, and counter present value.

Counter contact performs ON/OFF functions according to the result of counter instructions, and also available to be used as counter and input instructions.

Counter setting value is a place where a boundary value for the result of count is stored, and is available to be used with counter and application instructions.

Counter present value is a place where a present value is stored while counter is operating, and user can not set it up directly.

When as following picture, if inputting 100 to "C0" setting value device, "C0" contact device turns ON when "C0" present value device becomes 100.



Counter instructions, related to LP Series are CTD, CTU, CTUD and CTR, and even the same counter device is operated differently depending on each instruction.

3.8 Z Device

It is a device that is able to designate indirectly a device with using other word device.

When as following picture, if "D0" device value is 10, the value 10 stored in "D0" is transferred to D(0+Z0) device, namely D100 device.



In other words, MOV D0 D0Z0 is interpreted as below.

- MOV D0 D (value of 0 + Z0)
- MOV D0 D (0+100)
- MOV D0 D100

For another example, if MOV D0 D40Z0 it could be interpreted as below.

- MOV D0 D (value of 40 + Z0)
- MOV D0 D (40+100)
- MOV D0 D 140

It is possible to designate a device address indirectly according to the change of Z device.

3.9 F Device

It is a device that sets up the status and operation of LP.

It designates a device that is able to be used separately in input and output instructions, and not able to be used as a memory protection area.

For further details of F device, refer to '4 Special '.

3.10 V Device

It is the used area for matched automatically device area by system when using user defined function. User can not use this device area.

3.11 L Device

It is a link device. It is a device sharing link data each other when communicating with other module.

It is available to be used as a memory protection device by setting 'Device Latch Range Settings' in [Parameter]-[COMMON].

3.12 R Device

It is a device used when using the recipe function of graphic panel in LP series.

It is available to be used as a memory protection device by setting 'Device Latch Range Settings' in [Parameter]-[COMMON].

3.13 Device List

3.13.1 LP-S044/LP-S070

	Description	Bit range	Word range	GP device(UB)	GP device (UW)
x	Input device	X0 to X255F	X0 to X255	UB70000 to UB7255F	UW7000 to UW7255
Y	Output device	Y0 to Y255F	Y0 to Y255	UB80000 to UB8255F	UW8000 to UW8255
М	Auxiliary device	M0 to M9999F	M0 to M9999	UB200000 to UB29999F	UW20000 to UW29999
s	Step device	S0.0 to S255.99			
D	Data device	D0 to D9999F	D0 to D9999	UB400000 to UB49999F	UW40000 to UW49999
т	Timer contact	T0 to T255		UB100000 to UB10015F	UW10000 to UW10015
т	Timer present value		T0 to T255	UB110000 to UB11255F	UW11000 to UW11255
т	Timer set value		T0 to T255	UB130000 to UB13255F	UW13000 to UW13255
С	Counter contact	C0 to C255		UB150000 to UB15015F	UW15000 to UW15015
С	Counter present value		C0 to C255	UB160000 to UB16255F	UW16000 to UW16255
С	Counter set value		C0 to C255	UB180000 to UB18255F	UW18000 to UW18255
z	Index device	Z0 to Z255F	Z0 to Z255	UB067000 to UB06955F	UW06700 to UW06955
F	Special device	F0 to F255F	F0 to F255	UB064000 to UB066550F	UW06400 to UW06655
V	Virtual device	V0 to V255F	V0 to V255	UB061000 to UB06355F	UW06100 to UW06355
L	Link device	L0 to L999F	L0 to L999		UW38000 to UW38999
R	File device	R0 to R3999F	R0 to R3999	UB020000 to UB05999F	UW02000 to UW05999
UW /UB	Read area			UB000000 to UB00014F	UW00000 to UW00014
UW /UB	Write area			UB000015 to UB00029F	UW00015 to UW00029
UW /UB	User area			UB000030 to UB01999F	UW00030 to UW01999

3.13.2 LP-A070/LP-A104

	Description	Bit range	Word range	GP device (UB)	GP device (UW)
x	Input device	X0 to X255F	X0 to X255	UB70000 to UB7255F	UW7000 to UW7255
Y	Output device	Y0 to Y255F	Y0 to Y255	UB80000 to UB8255F	UW8000 to UW8255
М	Auxiliary device	M0 to M9999F	M0 to M9999	UB200000 to UB29999F	UW20000 to UW29999
S	Step device	S0.0 to S255.99			
D	Data device	D0 to D9999F	D0 to D9999	UB400000 to UB49999F	UW40000 to UW49999
т	Timer contact	T0 to T255		UB100000 to UB10015F	UW10000 to UW10015
т	Timer present value		T0 to T255	UB110000 to UB11255F	UW11000 to UW11255
т	Timer set value		T0 to T255	UB130000 to UB13255F	UW13000 to UW13255
С	Counter contact	C0 to C255		UB150000 to UB15015F	UW15000 to UW15015
С	Counter present value		C0 to C255	UB160000 to UB16255F	UW16000 to UW16255
С	Counter set value		C0 to C255	UB180000 to UB18255F	UW18000 to UW18255
z	Index device	Z0 to Z255F	Z0 to Z255	UB067000 to UB06955F	UW06700 to UW06955
F	Special device	F0 to F255F	F0 to F255	UB064000 to UB066550F	UW06400 to UW06655
V	Virtual device	V0 to V255F	V0 to V255	UB061000 to UB06355F	UW06100 to UW06355
L	Link device	L0 to L999F	L0 to L999		UW38000 to UW38999
R	File device	R0 to R3999F	R0 to R3999	UB020000 to UB05999F	UW02000 to UW05999
UW /UB	Read area			UB000000 to UB00014F	UW00000 to UW00014
UW /UB	Write area			UB000015 to UB00029F	UW00015 to UW00029
UW /UB	User area			UB000030 to UB01999F	UW00030 to UW01999
4 Special Device

4.1 LP-S044/LP-S070

4.1.1 Bit Special Device List

4.1.1.1 System Mode

Name	Function	Initial value	R/W	GP device	LP device
	 Turns ON, when system mode is run 				
Run mode	Turns OFF, when system mode	OFF	R	UB64000	F00000
	changes from run to other mode				
Stop mode	Turns ON, when system mode is stop				
	 Turns OFF, when system mode 	OFF	R	UB64001	F00001
	changes from stop to other mode				
	Turns ON, when system mode is pause				
Pause mode	 Turns OFF, when system mode 	OFF	R	UB64002	F00002
	changes from pause to other mode				
	Turns ON, when system mode is debug				
Debug mode	 Turns OFF, when system mode 	OFF	R	UB64003	F00003
	changes from debug to other mode				

4.1.1.2 System Signal

Name	Function	Initial value	R/W	GP device	LP device
Always ON	 Always ON, when PLC mode is run, debug mode Always OFF, when PLC mode is not run, debug mode 	OFF	R	UB64010	F00010
Always OFF	 Always OFF, when PLC mode is run, debug mode Always ON, when PLC mode is not run, debug mode 	OFF	R	UB64011	F00011
1 scan ON	 Turns ON only first scan, when PLC mode is run Turns OFF after second scan, when PLC mode is run 	OFF	R	UB64012	F00012
1 scan OFF	 Turns OFF only first one scan, when PLC mode is run Turns ON after second scan, when PLC mode is run, 	OFF	R	UB64013	F00013
Scan pulse	Reverse every scan, when PLC is in run mode	OFF	R	UB64014	F00014
Time synchronous pulse	One synchronous pulse during the RTC time.	OFF	R	UB64015	F00015

4.1.1.3 System Status

Name	Function	Initial value	R/W	GP device	LP device
While operating forced input	 Turns ON, when registering forced input device Turns OFF, when releasing forced input device 	OFF	R	UB64020	F00020
While operating forced output	 Turns ON, when registering forced output device Turns OFF, when releasing forced output device 	OFF	R	UB64021	F00021
While running time-driven	 Turns ON, when running time-driven Turns OFF, when stopping time-driven 	OFF	R	UB64024	F00024
Back-up battery errors (At present)	 Turns ON, when the backup battery voltage is below the standard level Turns OFF, when the backup battery voltage is over the standard level 	OFF	R	UB6402C	F0002C
Back-up battery errors (Retaining)	 Retains ON, when the backup battery voltage is below the standard level Turns OFF, when changing program or mode 	OFF	R	UB6402D	F0002D

4.1.1.4 System Error

Name	Function	Initial value	R/W	GP device	LP device
Error occurrence	 Turns ON, when any of errors occurs among the all defined errors Turns OFF, when clearing error 	OFF	R	UB64030	F00030
Errors related to PLC program	 Turns ON, when errors related to program occur Turns OFF, when clearing program error Turns OFF, when it stops operation Turns OFF, when changing program Turns OFF, when changing mode 	OFF	R	UB64034	F00034
Time-driven operation error	 Turns ON, when scan time is longer than time-driven setting time Turns OFF, when scan time is shorter than time-driven setting time 	OFF	R	UB64035	F00035
Time setting error flag	 Turns ON, when the time data is not properly written Turns OFF, when the time data is properly written by using RTC 	OFF	R	UB64036	F00036
Communicat ion errors (will be supported)	 Turns ON, when the communication error occurs Turns OFF, when the communication is properly completed 	OFF	R	UB64038	F00038
I/O setting value errors	 Internal device range includes actual unavailable range, this bit turns ON when checking 'Using Internal Device' of 'I/O Contact Setting' dialog box in 	OFF	R	UB64039	F00039

Name	Function	Initial value	R/W	GP device	LP device
	'EXTENSION' tab from atLogic's Parameter.				
	 When user does not turn OFF, this bit maintains. 				

4.1.1.5 Module Status

Name	Function	Initial value	R/W	GP device	LP device
Using inner device of SLOT 0	 Turns ON, when SLOT0 parameter uses more than one inner device Turns OFF, when SLOT0 parameter does not use inner device 	OFF	R	UB64040	F00040
Using inner device of SLOT 1	 Turns ON, when SLOT1 parameter uses more than one inner device Turns OFF, when SLOT1 parameter does not use inner device 	OFF	R	UB64041	F00041
Using inner device of SLOT 2	 Turns ON, when SLOT2 parameter uses more than one inner device Turns OFF, when SLOT2 parameter does not use inner device 	OFF	R	UB64042	F00042
Using inner device of SLOT 3	 Turns ON, when SLOT3 parameter uses more than one inner device Turns OFF, when SLOT3 parameter does not use inner device 	OFF	R	UB64043	F00043
Using inner device of SLOT 4	 Turns ON, when SLOT4 parameter uses more than one inner device Turns OFF, when SLOT4 parameter does not use inner device 	OFF	R	UB64044	F00044
Using inner device of SLOT 5	 Turns ON, when SLOT5 parameter uses more than one inner device Turns OFF, when SLOT5 parameter does not use inner device 	OFF	R	UB64045	F00045
Using inner device of SLOT 6	 Turns ON, when SLOT6 parameter uses more than one inner device Turns OFF, when SLOT6 parameter does not use inner device 	OFF	R	UB64046	F00046
Using inner device of SLOT 7	 Turns ON, when SLOT7 parameter uses more than one inner device Turns OFF, when SLOT7 parameter does not use inner device 	OFF	R	UB64047	F00047
Using inner device of SLOT 8	 Turns ON, when SLOT8 parameter uses more than one inner device Turns OFF, when SLOT8 parameter does not use inner device 	OFF	R	UB64048	F00048
Using inner device of SLOT 9	 Turns ON, when SLOT9 parameter uses more than one inner device Turns OFF, when SLOT9 parameter does not use inner device 	OFF	R	UB64049	F00049
Using inner device of	Turns ON, when SLOT10 parameter uses more than one inner device	OFF	R	UB6404A	F0004A

Name	Function	Initial value	R/W	GP device	LP device
SLOT 10	 Turns OFF, when SLOT10 parameter does not use inner device 				
Using inner device of SLOT 11	 Turns ON, when SLOT11 parameter uses more than one inner device Turns OFF, when SLOT11 parameter does not use inner device 	OFF	R	UB6404B	F0004B
Using inner device of SLOT 12	 Turns ON, when SLOT12 parameter uses more than one inner device Turns OFF, when SLOT12 parameter does not use inner device 	OFF	R	UB6404C	F0004C
Using inner device of SLOT 13	 Turns ON, when SLOT13 parameter uses more than one inner device Turns OFF, when SLOT13 parameter does not use inner device 	OFF	R	UB6404D	F0004D
Using inner device of SLOT 14	 Turns ON, when SLOT14 parameter uses more than one inner device Turns OFF, when SLOT14 parameter does not use inner device 	OFF	R	UB6404E	F0004E
Using inner device of SLOT 15	 Turns ON, when SLOT15 parameter uses more than one inner device Turns OFF, when SLOT15 parameter does not use inner device 	OFF	R	UB6404F	F0004F

4.1.1.6 System Clock

Name	Function	lnitial value	R/W	GP device	LP device
10ms clock	10ms cycle of system clock occurs		R	UB64054	F00054
20ms clock	20ms cycle of system clock occurs		R	UB64055	F00055
50ms clock	50ms cycle of system clock occurs		R	UB64056	F00056
100ms clock	100ms cycle of system clock occurs		R	UB64057	F00057
200ms clock	200ms cycle of system clock occurs		R	UB64058	F00058
500ms clock	500ms cycle of system clock occurs		R	UB64059	F00059
1s clock	1s cycle of system clock occurs		R	UB6405A	F0005A
2s clock	2s cycle of system clock occurs		R	UB6405B	F0005B
5s clock	5s cycle of system clock occurs		R	UB6405C	F0005C
10s clock	10s cycle of system clock occurs		R	UB6405D	F0005D
60s clock	60s cycle of system clock occurs		R	UB6405E	F0005E

4.1.1.7 Operation

Name	Function	Initial value	R/W	GP device	LP device
Zero flag	 Turns ON, when operation result is 0 Turns OFF, when operation result is not 0 	OFF	R	UB64060	F00060
Carry flag	 Turns ON, when carry occurs as operation result Turns OFF, when carry does not occur as operation result 	OFF	R	UB64061	F00061
Borrow flag	 Turns ON, when borrow occurs as operation result Turns OFF, when borrow does not occur as operation result Turns OFF, when changing program or mode 	OFF	R	UB64062	F00062
Operation error flag (At present)	 Turns ON, when operation error occurs during scan operation Turns OFF, when changing the other mode except stop mode Turns OFF, when there is no operation error after one scan operation Turns OFF, when downloading program or re-setting power 	OFF	R	UB64068	F00068
Operation error flag (Retaining)	 Retains ON, when operation error occurs during scan operation Turns OFF, when resetting power 	OFF	R	UB64069	F00069

4.1.1.8 System Setting

Name	Function	Initial value	R/W	GP device	LP device
Settings for full output restriction	 When it turns ON, it is restricted port output and all ports becomes OFF. 	OFF	W	UB64070	F00070
Start-up time-driven activity	 When it turns ON, it starts time-driven activity depending on a word setting value of time-driven run-time. When it turns OFF, it operates minimum speed of scan as possible as it can. 	OFF	w	UB64074	F00074
Operating conditions for extended module function	 After checking 'Operating only in run mode' in 'COMMON' tab from atLogic's Parameter and downloading these, it turns RESET. After checking 'Operating in stop mode' in 'COMMON' tab from atLogic's Parameter and downloading these, it turns SET. In case of uploading from LP, it does not read data from parameter file, it is uploaded with the set contents from the special register. 	OFF	w	UB64078	F00078
Default filter setting flag	 When it is set, operate all undefined filters of module in parameters as default values. When it is reset, all undefined filters of module are operated without a filter. 	OFF	w	UB64079	F00079

4.1.1.9 Time Setting

Name	Function	Initial value	R/W	GP device	LP device
Time setting	 Set it as a special register after it is ON. At this time, the time is not changed. When it turns OFF after completing settings, it is writing in RTC and the time set in the special register keeps going on. 	OFF	w	UB64080	F00080
+/- 30 sec correction of time setting	 When it changes from OFF to ON within the range of 0 to 29sec, the time (second) is shifted to 00. When it changes from OFF to ON within the range of 30 to 59sec, the time(second) is shifted to 00 and increased one minute 	OFF	w	UB64081	F00081

4.1.1.10 Module Setting

Name	Function	Initial value	R/W	GP device	LP device
Settings for using inner device of SLOT0 module function	When bit turns ON, inner device value is written to module register	OFF	w	UB64090	F00090
Settings for using inner device of SLOT1 module function	When bit turns ON, inner device value is written to module register	OFF	w	UB64091	F00091
Settings for using inner device of SLOT2 module function	When bit turns ON, inner device value is written to module register	OFF	w	UB64092	F00092
Settings for using inner device of SLOT3 module function	When bit turns ON, inner device value is written to module register	OFF	w	UB64093	F00093
Settings for using inner device of SLOT4 module function	When bit turns ON, inner device value is written to module register	OFF	w	UB64094	F00094
Settings for using inner device of SLOT5 module function	When bit turns ON, inner device value is written to module register	OFF	w	UB64095	F00095
Settings for using inner device of SLOT6 module function	When bit turns ON, inner device value is written to module register	OFF	w	UB64096	F00096
Settings for using inner device of SLOT7 module function	When bit turns ON, inner device value is written to module register	OFF	w	UB64097	F00097
Settings for using inner device of SLOT8 module function	When bit turns ON, inner device value is written to module register	OFF	w	UB64098	F00098
Settings for using inner device of SLOT9 module function	When bit turns ON, inner device value is written to module register	OFF	w	UB64099	F00099
Settings for using inner device of SLOT10 module function	When bit turns ON, inner device value is written to module register	OFF	w	UB6409A	F0009A
Settings for using inner device of SLOT11 module function	When bit turns ON, inner device value is written to module register	OFF	w	UB6409B	F0009B
Settings for using inner device of SLOT12 module function	When bit turns ON, inner device value is written to module register	OFF	w	UB6409C	F0009C
Settings for using inner device of SLOT13 module function	When bit turns ON, inner device value is written to module register	OFF	w	UB6409D	F0009D
Settings for using inner device of SLOT14 module function	When bit turns ON, inner device value is written to module register	OFF	w	UB6409E	F0009E
Settings for using inner device of	When bit turns ON, inner device value is written to	OFF	W	UB6409F	F0009F

Name	Function	Initial value	R/W	GP device	LP device
SLOT15 module function	module register				

4.1.1.11 Motion Control

(1) CH1 special device

Name	Function	R/W	GP device	LP device
Using Motion CH1	1: Use0: No use	R	UB64100	F100
Moving of Motion CH1 (Accel, decel, constant)	1: Moving0: Not moving	R	UB64101	F101
Using acceleration of Motion CH1	1: Accelerating0: Not accelerating	R	UB64102	F102
Driving with set speed of Motion CH1	 1: Operating with set speed 0: Not operating with set speed 	R	UB64103	F103
Decelerating of Motion CH1	1: Decelerating0: Not decelerating	R	UB64104	F104
Dwelling of Motion CH1	1: Dwelling0: Not dwelling	R	UB64105	F105
Finish driving of CH1	1: Finishing drive0: Not finishing drive	R	UB64106	F106
Detecting S/W lower limit of Motion CH1	 1: Detecting S/W lower limit 0: Not detecting S/W lower limit 	R	UB64107	F107
Detecting S/W upper limit of Motion CH1	 1: Detecting S/W upper limit 0: Not detecting S/W upper limit 	R	UB64108	F108
Detecting H/W lower limit of Motion CH1	 1: Detecting H/W upper limit 0: Not detecting H/W upper limit 	R	UB64109	F109
Detecting H/W upper limit of Motion CH1	 1: Detecting H/W lower limit 0: Not detecting H/W lower limit 	R	UB6410A	F10A

(2) CH2 special device

Name	Function	R/W	GP device	LP device
Using Motion CH2	1: Use0: No use		UB64120	F120
Moving of Motion CH2 (Accel, decel, constant)	1: Moving0: Not moving		UB64121	F121
Using acceleration of Motion CH2	1: Accelerating0: Not accelerating	R	UB64122	F122
Driving with set speed of Motion CH2	1: Operating with set speed0: Not operating with set speed	R	UB64123	F123
Decelerating of Motion CH2	1: Decelerating0: Not decelerating	R	UB64124	F124
Dwelling of Motion CH2	1: Dwelling0: Not dwelling	R	UB64125	F125

Name	Function		GP device	LP device
Finish driving of CH2	1: Finishing drive0: Not finishing drive	R	UB64126	F126
Detecting S/W lower limit of Motion CH2	 1: Detecting S/W lower limit 0: Not detecting S/W lower limit 	R	UB64127	F127
Detecting S/W upper limit of Motion CH2	 1: Detecting S/W upper limit 0: Not detecting S/W upper limit 	R	UB64128	F128
Detecting H/W lower limit of Motion CH2	 1: Detecting H/W upper limit 0: Not detecting H/W upper limit 	R	UB64129	F129
Detecting H/W upper limit of Motion CH2	 1: Detecting H/W lower limit 0: Not detecting H/W lower limit 	R	UB6412A	F12A

(3) Jog special device

Name	Function	R/W	GP device	LP device
Jog starting forward of Motion CH1	 ON rising: Moving forward jog in accelerating and constant speed OFF falling: Moving forward jog in decelerating and stop 	R/W	UB64501	F501
Jog starting backward of Motion CH1	 ON rising: Moving backward jog in accelerating and constant speed OFF falling: Moving backward jog in decelerating and stop 	R/W	UB64502	F502
Jog starting forward of Motion CH2	 ON rising: Moving forward jog in accelerating and constant speed OFF falling: Moving forward jog in decelerating and stop 	R/W	UB64503	F503
Jog starting backward of Motion CH2	 ON rising: Moving backward jog in accelerating and constant speed OFF falling: Moving backward jog in decelerating and stop 	R/W	UB64504	F504

4.1.2 Word Special Device

4.1.2.1 PLC Model

Name	Function		GP Device	LP device
PLC series and model code	 High 2 digits = Series code Low 2 digits = Model code 		UW6500	F0100
System version	Displays the version of firmware by the range of 5 word		UW6501 to UW6505	F0101 to F0105
Released date of the version(Year)	Released year of the version	R	UW6506	F0106
Released date of the version(Month, date)	e of the n, date) Released month and date of the version. Displays 4 digits, high 2 digits denotes month and low 2 digits denotes date.		UW6507	F0107

4.1.2.2 Scan Time

Name	Function		GP device	LP device
Present scan	Executing time for present scan	R		E0110
time	(Revised in every scan)		000010	10110
Min. scan	Min. scan time during the operation	Б	UW6511	F0111
time	(It clears when changing PLC mode or program)	ĸ		
Max. scan	Max. scan time during the operation	Б	UW6512	F0112
time	(It clears when changing PLC mode or program)	ĸ		
Average scan	Diaplaya ayaraga agan tima	Б		E0112
time	Displays average scall tille	ĸ	0000313	FUI 13

4.1.2.3 Operation

Name	Function	R/W	GP device	LP device
Step operation generated error (At present)	Present step which has operation error (It clears when changing PLC mode or program)	R	UW6520	F0120
Step operation generated error (Retaining)	First operation error step, (It clears when changing PLC mode or program)	R	UW6521	F0121

4.1.2.4 Step

Name	Function	R/W	GP Device	LP device
Error step	Stopped step by error at present	R	UW6530	F0130
Break step	Braked step during debug mode operation	Б	UW6531	F0131
	(It clears when changing PLC mode or program)	ĸ		

4.1.2.5 Diagnosis

Name		Function		R/W	GP device	LP device	
Self-diagno	sis error code	Displays self-	diagnosis error code	R	UW6540	F0140	
UW6540 (F0140)	Туре		Cause of error				
0X0010	Watchdog erro	or	Scan time excesses wate	chdog ti	mer setting va	alue	
0X0020	Memory error		When a certain area of m un-approached state.	nemory	is the		
0x0021	Battery error		When battery value is be	low the	standard leve	əl	
0x0022	RTC setting e	rror	Disable to set RTC and F	RTC op	eration error		
0X0030	X0030 Program instruction error		When the program conta	ins inst	ructions that a	are not able	
			to read and inappropriate	e forms.			
0)/000/			When there is not the instructions required to process the				
0X0031	Program sequence error		FND RET and IRET, etc.				
			When there are some problems in settings for common				
0X0040	Parameter set	ting error	and expansion parameters.				
020041	Timo drivon o	ror	When it operates longer than the given time-driven run-				
070041	nine-unven e		time.				
	Extended more	tulo sotting	In case, the hardware constructions are different from				
0X0050		iule setting	previous parameter settings when applying power again				
	enor		and changing the mode.				
0X0051	Extended mod	lule attaching	When the extended module is attached or removed in run				
070031	and removing error		mode.				
0x0060	0 Communication fail error		When it is received NAK	and da	ta format not a	able to read.	
	Communicatio	n format	When there are some pro	oblems	occurred in fo	ormats	
0x0061	orror	nionnal	(excess of limited range etc.) and CHECK SUM while				
	enor		download and upload.	pload.			

4.1.2.6 Time

Name	Function	R/W	GP device	LP device
Time setting (Year)	Save the setting value of year as BCD Data	W	UW6550	F0150
Time setting (Month)	Save the setting value of month as BCD Data		UW6551	F0151
Time setting (Date)	Save the setting value of date as BCD Data		UW6552	F0152
Time setting (Hour)	Save the setting value of hour as BCD Data		UW6553	F0153
Time setting (Min)	Save the setting value of minute as BCD Data		UW6554	F0154
Time setting (Sec)	Save the setting value of second as BCD Data		UW6555	F0155
Time setting (Day)	(Day) Save the setting value of the day of week as BCD Data 0: Sunday, 1: Monday, 2: Tuesday, 3: Wednesday, 4: Thursday, 5: Friday, 6: Saturday		UW6556	F0156

4.1.2.7 Input Filter Setting

Name	Function	R/W	GP device	LP device
Input filter settings	Designates default input filter value by ms unit When this is 0, it does not set filter value. It applies to all of non-filter setting modules.	R/W	UW6560	F0160

4.1.2.8 Time-driven Run-time Settings

Name	Function	R/W	GP device	LP device
Time-driven run-time settings	When time-driven setting flag is ON, time-driven running operates with the setting time of this register.	R/W	UW6561	F0161
Watchdog timer settings	0 to 65535 (Unit: ms)	R/W	UW6562	F0162

4.1.2.9 Time-driven Interrupt

Name	Function	R/W	GP device	LP device
Time-driven interrupt cycle	Time-driven interrupt cycle			F0470
settings 1	settings 1	r///	000570	FUITU
Time-driven interrupt cycle	Time-driven interrupt cycle			F0171
settings 2	settings 2	R/W	000071	FUI/I
Time-driven interrupt cycle	Time-driven interrupt cycle			F0470
settings 3	settings 3	R/W	0000572	F0172
Time-driven interrupt cycle	Time-driven interrupt cycle		1 11 10 5 7 0	F0173
settings 4	settings 4	R/W	000573	
Time-driven interrupt cycle	Time-driven interrupt cycle			50474
settings 5	settings 5	R/W	0000574	F0174
Time-driven interrupt cycle	Time-driven interrupt cycle			50475
settings 6	settings 6	R/W	000575	F0175
Time-driven interrupt cycle	Time-driven interrupt cycle			50470
settings 7	settings 7	R/W	000576	FU1/6
Time-driven interrupt cycle	Time-driven interrupt cycle			F0177
settings 8	settings 8	FK/ V V	000077	

4.1.2.10 Motion Control

(1) CH1 Special device

Name	Function	R/W	GP device	LP device
Current position	Current position of Motion CH1	R	UW6460	F60
Current speed	Current speed of Motion CH1	R	UW6462	F62
Action No.	Current action No. of Motion CH1	R	UW6464	F64
Pattern No.	Current pattern No. of Motion CH1	R	UW6465	F65
Home position	Current home position of Motion CH1	R	UW6466	F66
Set speed	Setting speed of Motion CH1	R	UW6468	F68
Error check	Error code check of Motion CH1	R	UW6420	F20

(2) CH2 Special device

Name	Function	R/W	GP device	LP device
Current position	Current position of Motion CH2	R	UW6470	F70
Current speed	Current speed of Motion CH2	R	UW6472	F72
Action No.	Current action No. of Motion CH2	R	UW6474	F74
Pattern No.	Current pattern No. of Motion CH2	R	UW6475	F75
Home position	Current home position of Motion CH2	R	UW6476	F76
Set speed	Setting speed of Motion CH2	R	UW6478	F78
Error check	Error code check of Motion CH2	R	UW6421	F21

4.2 LP-A070/LP-A104

4.2.1 Bit Special Device

4.2.1.1 System Mode

Name	Function	Initial value	R/W	GP device	LP device
	Turns ON, when system mode is run				
Run mode	Turns OFF, when system mode	OFF	R	UB744000	F00000
	changes from run to other mode				
	 Turns ON, when system mode is stop 				
Stop mode	 Turns OFF, when system mode 	OFF	R	UB744001	F00001
	changes from stop to other mode				
	Turns ON, when system mode is pause				
Pause mode	 Turns OFF, when system mode 	OFF	R	UB744002	F00002
	changes from pause to other mode				
Debug mode	Turns ON, when system mode is debug				
	 Turns OFF, when system mode 	OFF	R	UB744003	F00003
	changes from debug to other mode				

4.2.1.2 System Signal

Name	Function	Initial value	R/W	GP device	LP device
Always ON	 Always ON, when PLC mode is run, debug mode Always OFF, when PLC mode is not run, debug mode 	OFF	R	UB744010	F00010
Always OFF	 Always OFF, when PLC mode is run, debug mode Always ON, when PLC mode is not run, debug mode 	OFF	R	UB744011	F00011
1 scan ON	 Turns ON only first scan, when PLC mode is run Turns OFF after second scan, when PLC mode is run 	OFF	R	UB744012	F00012
1 scan OFF	 Turns OFF only first one scan, when PLC mode is run Turns ON after second scan, when PLC mode is run, 	OFF	R	UB744013	F00013
Scan pulse	Reverse every scan, when PLC is in run mode	OFF	R	UB744014	F00014
Time synchronous pulse	One synchronous pulse during the RTC time.	OFF	R	UB744015	F00015

4.2.1.3 System Status

Name	Function	Initial value	R/W	GP device	LP device
While operating forced input	 Turns ON, when registering forced input device Turns OFF, when releasing forced input device 	OFF	R	UB744020	F00020
While operating forced output	 Turns ON, when registering forced output device Turns OFF, when releasing forced output device 	OFF	R	UB744021	F00021
While running time-driven	 Turns ON, when running time-driven Turns OFF, when stopping time-driven 	OFF	R	UB744024	F00024
Back-up battery errors (At present)	 Turns ON, when the backup battery voltage is below the standard level Turns OFF, when the backup battery voltage is over the standard level 	OFF	R	UB744025	F00025
Back-up battery errors (Retaining)	 Retains ON, when the backup battery voltage is below the standard level Turns OFF, when changing program or mode 	OFF	R	UB74402 C	F0002C

4.2.1.4 System Error

Name	Function	Initial value	R/W	GP device	LP device
Error	Turns ON, when any of errors occurs among the all defined errors Turns OEE when clearing error	OFF	R	UB744030	F00030
Errors related to PLC program	 Turns OFF, when cleaning enor Turns ON, when errors related to program occur Turns OFF, when clearing program error Turns OFF, when it stops operation Turns OFF, when changing program Turns OFF, when changing mode 	OFF	R	UB744034	F00034
Time-driven operation error	 Turns ON, when scan time is longer than time-driven setting time Turns OFF, when scan time is shorter than time-driven setting time 	OFF	R	UB744035	F00035
Time setting error flag	 Turns ON, when the time data is not properly written Turns OFF, when the time data is properly written by using RTC 	OFF	R	UB744036	F00036
Communicat ion errors (will be supported)	 Turns ON, when the communication error occurs Turns OFF, when the communication is properly completed 	OFF	R	UB744038	F00038

Name	Function	Initial value	R/W	GP device	LP device
I/O setting value errors	 Internal device range includes actual unavailable range, this bit turns ON when checking 'Using Internal Device' of 'I/O Contact Setting' dialog box in 'EXTENSION' tab from atLogic's Parameter. When user does not turn OFF, this bit maintains. 	OFF	R	UB744039	F00039
Watch dog timer error	 Turns ON, when watch dog timer occurs Turns OFF, when watch dog timer error clear 	OFF	R	UB74403 A	F0003A

4.2.1.5 Module Status

Name	Function	Initial value	R/W	GP device	LP device
Using inner device of SLOT 0	 Turns ON, when SLOT0 parameter uses more than one inner device Turns OFF, when SLOT0 parameter does not use inner device 	OFF	R	UB744040	F00040
Using inner device of SLOT 1	 Turns ON, when SLOT1 parameter uses more than one inner device Turns OFF, when SLOT1 parameter does not use inner device 	OFF	R	UB744041	F00041
Using inner device of SLOT 2	 Turns ON, when SLOT2 parameter uses more than one inner device Turns OFF, when SLOT2 parameter does not use inner device 	OFF	R	UB744042	F00042
Using inner device of SLOT 3	 Turns ON, when SLOT3 parameter uses more than one inner device Turns OFF, when SLOT3 parameter does not use inner device 	OFF	R	UB744043	F00043
Using inner device of SLOT 4	 Turns ON, when SLOT4 parameter uses more than one inner device Turns OFF, when SLOT4 parameter does not use inner device 	OFF	R	UB744044	F00044
Using inner device of SLOT 5	 Turns ON, when SLOT5 parameter uses more than one inner device Turns OFF, when SLOT5 parameter does not use inner device 	OFF	R	UB744045	F00045
Using inner device of SLOT 6	 Turns ON, when SLOT6 parameter uses more than one inner device Turns OFF, when SLOT6 parameter does not use inner device 	OFF	R	UB744046	F00046
Using inner device of SLOT 7	 Turns ON, when SLOT7 parameter uses more than one inner device Turns OFF, when SLOT7 parameter does not use inner device 	OFF	R	UB744047	F00047
Using inner device of	 Turns ON, when SLOT8 parameter uses more than one inner device Turns OFF, when SLOT8 parameter 	OFF	R	UB744048	F00048

Name	Function	Initial value	R/W	GP device	LP device
SLOT 8	does not use inner device				
Using inner device of SLOT 9	 Turns ON, when SLOT9 parameter uses more than one inner device Turns OFF, when SLOT9 parameter does not use inner device 	OFF	R	UB744049	F00049
Using inner device of SLOT 10	 Turns ON, when SLOT10 parameter uses more than one inner device Turns OFF, when SLOT10 parameter does not use inner device 	OFF	R	UB74404A	F0004A
Using inner device of SLOT 11	 Turns ON, when SLOT11 parameter uses more than one inner device Turns OFF, when SLOT11 parameter does not use inner device 	OFF	R	UB74404B	F0004B
Using inner device of SLOT 12	 Turns ON, when SLOT12 parameter uses more than one inner device Turns OFF, when SLOT12 parameter does not use inner device 	OFF	R	UB74404C	F0004C
Using inner device of SLOT 13	 Turns ON, when SLOT13 parameter uses more than one inner device Turns OFF, when SLOT13 parameter does not use inner device 	OFF	R	UB74404D	F0004D
Using inner device of SLOT 14	 Turns ON, when SLOT14 parameter uses more than one inner device Turns OFF, when SLOT14 parameter does not use inner device 	OFF	R	UB74404E	F0004E
Using inner device of SLOT 15	 Turns ON, when SLOT15 parameter uses more than one inner device Turns OFF, when SLOT15 parameter does not use inner device 	OFF	R	UB74404F	F0004F

4.2.1.6 System Clock

Name	Function	lnitial value	R/W	GP device	LP device
10ms clock	10ms cycle of system clock occurs		R	UB744050	F00050
20ms clock	20ms cycle of system clock occurs		R	UB744051	F00051
50ms clock	50ms cycle of system clock occurs		R	UB744052	F00052
100ms clock	100ms cycle of system clock occurs		R	UB744053	F00053
200ms clock	200ms cycle of system clock occurs		R	UB744054	F00054
500ms clock	500ms cycle of system clock occurs		R	UB744055	F00055
1s clock	1s cycle of system clock occurs		R	UB744056	F00056
2s clock	2s cycle of system clock occurs		R	UB744057	F00057
5s clock	5s cycle of system clock occurs		R	UB744058	F00058
10s clock	10s cycle of system clock occurs		R	UB744059	F00059
60s clock	60s cycle of system clock occurs		R	UB74405A	F0005A

4.2.1.7 Operation

Name	Function	Initial value	R/W	GP device	LP device
Zero flag	 Turns ON, when operation result is 0 Turns OFF, when operation result is not 0 	OFF	R	UB744060	F00060
Carry flag	 Turns ON, when carry occurs as operation result Turns OFF, when carry does not occur as operation result 	OFF	R	UB744061	F00061
Borrow flag	 Turns ON, when borrow occurs as operation result Turns OFF, when borrow does not occur as operation result Turns OFF, when changing program or mode 	OFF	R	UB744062	F00062
Operation error flag (At present)	 Turns ON, when operation error occurs during scan operation Turns OFF, when changing the other mode except stop mode Turns OFF, when there is no operation error after one scan operation Turns OFF, when downloading program or re-setting power 	OFF	R	UB744068	F00068
Operation error flag (Retaining)	 Retains ON, when operation error occurs during scan operation Turns OFF, when resetting power 	OFF	R	UB744069	F00069

4.2.1.8 System Setting

Name	Function	Initial value	R/W	GP device	LP device
Settings for full output restriction	 When it turns ON, it is restricted port output and all ports becomes OFF. 	OFF	w	UB744070	F00070
Settings for output reset restriction	 When it turns ON, it is restricted output reset 	OFF	w	UB744071	F00071
Start-up time-driven activity	 When it turns ON, it starts time-driven activity depending on a word setting value of time-driven run-time. When it turns OFF, it operates minimum speed of scan as possible as it can. 	OFF	w	UB744074	F00074
Change time-driven activity operating time	 When it turns ON, it changes the time of time-driven activity operation 	OFF	w	UB744075	F00075
Change time-driven activity interrupt time	 When it turns ON, it changes the time of time-driven activity interrupt 	OFF	w	UB744076	F00076
Remain output status while stop	 Turns ON, when output status remains Turns OFF, when output status does not remain 	OFF	w	UB744077	F00077
Operating conditions for extended module function	 After checking 'Operating only in run mode' in 'COMMON' tab from atLogic's Parameter and downloading these, it turns RESET. After checking 'Operating in stop mode' in 'COMMON' tab from atLogic's Parameter and downloading these, it turns SET. In case of uploading from LP, it does not read data from parameter file, it is uploaded with the set contents from the special register. When it is set operate all undefined 	OFF	W	UB744078	F00078
Default filter setting flag	 When it is set, operate all undefined filters of module in parameters as default values. When it is reset, all undefined filters of module are operated without a filter. 	OFF	w	UB744079	F00079

4.2.1.9 Time Setting

Name	Function	Initial value	R/W	GP device	LP device
Time setting	 Set it as a special register after it is ON. At this time, the time is not changed. When it turns OFF after completing settings, it is writing in RTC and the time set in the special register keeps going on. 	OFF	w	UB64080	F00080
+/- 30 sec correction of time setting	 When it changes from OFF to ON within the range of 0 to 29sec, the time (second) is shifted to 00. When it changes from OFF to ON within the range of 30 to 59sec, the time(second) is shifted to 00 and increased one minute 	OFF	w	UB64081	F00081

4.2.1.10 Module Setting

Name	Function	Initial value	R/W	GP device	LP device
Settings for using	When bit turns ON, inner				
inner device of SLOT0	device value is written to	OFF	W	UB744090	F00090
module function	module register				
Settings for using	When bit turns ON, inner				
inner device of SLOT1	device value is written to	OFF	W	UB744091	F00091
module function	module register				
Settings for using	When bit turns ON, inner				
inner device of SLOT2	device value is written to	OFF	W	UB744092	F00092
module function	module register				
Settings for using	When bit turns ON, inner				
inner device of SLOT3	device value is written to	OFF	W	UB744093	F00093
module function	module register				
Settings for using	When bit turns ON, inner				
inner device of SLOT4	device value is written to	OFF	W	UB744094	F00094
module function	module register				
Settings for using	When bit turns ON, inner				
inner device of SLOT5	device value is written to	OFF	W	UB744095	F00095
module function	module register				
Settings for using	When bit turns ON, inner				
inner device of SLOT6	device value is written to	OFF	W	UB744096	F00096
module function	module register				
Settings for using	When bit turns ON, inner				
inner device of SLOT7	device value is written to	OFF	W	UB744097	F00097
module function	module register				

Autonics

Name	Function	Initial value	R/W	GP device	LP device
Settings for using	When bit turns ON, inner				
inner device of SLOT8	device value is written to	OFF	W	UB744098	F00098
module function	module register				
Settings for using	When bit turns ON, inner				
inner device of SLOT9	device value is written to	OFF	W	UB744099	F00099
module function	module register				
Settings for using	When hit turns ON inner				
inner device of	device value is written to	OFF	\M/	UB74409	F0009A
SLOT10 module	module register		vv	A	FUUU9A
function	module register				
Settings for using	When hit turns ON inner				
inner device of	dovico valuo is writton to	OFF	W	UB74409 B	F0009B
SLOT11 module	module register				
function					
Settings for using	When hit turns ON inner			UB74409 C	F0009C
inner device of	dovico valuo is writton to	OFF	W		
SLOT12 module	modulo register				
function					
Settings for using	When hit turns ON inner				
inner device of	device value is written to	OFF	۱۸/	UB74409	E0000D
SLOT13 module	modulo register	OFF	vv	D	10009D
function	module register				
Settings for using	When hit turns ON inner				
inner device of	device value is written to	OFF	۱۸/	UB74409	FOOOF
SLOT14 module	medule register	OFF	vv	E	FUUU9E
function	module register				
Settings for using					
inner device of	vvnen bit turns ON, inner		w	UB74409F	FOOOF
SLOT15 module	uevice value is written to				FUUU9F
function					

4.2.1.11 Motion control

(1) CH1 special device

Name	Function	R/W	GP device	LP device
Using Motion CH1	1: Use0: No use	R	UB744100	F00100
Moving of Motion CH1 (Accel, decel, constant)	1: Moving0: Not moving	R	UB744101	F00101
Using acceleration of Motion CH1	1: Accelerating0: Not accelerating	R	UB744102	F00102
Driving with set speed of Motion CH1	 1: Operating with set speed 0: Not operating with set speed 	R	UB744103	F00103
Decelerating of Motion CH1	1: Decelerating0: Not decelerating	R	UB744104	F00104
Dwelling of Motion CH1	1: Dwelling0: Not dwelling	R	UB744105	F00105
Finish driving of CH1	1: Finishing drive0: Not finishing drive	R	UB744106	F00106
Detecting S/W lower limit of Motion CH1	 1: Detecting S/W lower limit 0: Not detecting S/W lower limit 	R	UB744107	F00107
Detecting S/W upper limit of Motion CH1	 1: Detecting S/W upper limit 0: Not detecting S/W upper limit 	R	UB744108	F00108
Detecting H/W lower limit of Motion CH1	 1: Detecting H/W upper limit 0: Not detecting H/W upper limit 	R	UB744109	F00109
Detecting H/W upper limit of Motion CH1	 1: Detecting H/W lower limit 0: Not detecting H/W lower limit 	R	UB74410 A	F0010A
Motion CH 1 usage error	1: Error occurs0: Not error occurs	R	UB74411 0	F00110
Motion CH 1 emergency stop error	1: Error occurs0: No error	R	UB74411 F	F0011F
MTSRS action designated flag (Action list exit)	 1: Exit action list 0: Not exit action list 	R	UB74440 0	F00400
MTSRS action designated flag (group exit)	1: Group exit0: Not group exit	R	UB74440 1	F00401

(2) CH2 special device

Name	Function	R/W	GP device	LP device
Using Motion CH2	1: Use0: No use	R	UB744120	F00120
Moving of Motion CH2 (Accel, decel, constant)	1: Moving0: Not moving	R	UB744121	F00121
Using acceleration of Motion CH2	1: Accelerating0: Not accelerating	R	UB744122	F00122
Driving with set speed of Motion CH2	 1: Operating with set speed 0: Not operating with set speed 	R	UB744123	F00123
Decelerating of Motion CH2	1: Decelerating0: Not decelerating	R	UB744124	F00124
Dwelling of Motion CH2	1: Dwelling0: Not dwelling	R	UB744125	F00125
Finish driving of CH2	1: Finishing drive0: Not finishing drive	R	UB744126	F00126
Detecting S/W lower limit of Motion CH2	 1: Detecting S/W lower limit 0: Not detecting S/W lower limit 	R	UB744127	F00127
Detecting S/W upper limit of Motion CH2	 1: Detecting S/W upper limit 0: Not detecting S/W upper limit 	R	UB744128	F00128
Detecting H/W lower limit of Motion CH2	 1: Detecting H/W upper limit 0: Not detecting H/W upper limit 	R	UB744129	F00129
Detecting H/W upper limit of Motion CH2	1: Detecting H/W lower limit0: Not detecting H/W lower limit	R	UB74412A	F0012A
Motion CH 2 usage error	1: Error occurs 0: Not error occurs	R	UB744130	F00130
Motion CH 2 emergency stop error	1: Error occurs 0: No error	R	UB74413F	F0013F
MTSRS action designated flag (Action list exit)	 1: Exit action list 0: Not exit action list 	R	UB744402	F00402
MTSRS action designated flag (group exit)	1: Group exit0: Not group exit	R	UB744403	F00403

(3) Jog special device

Name	Function	R/W	GP device	LP device
Jog starting forward of Motion CH1	 ON rising: Moving forward jog in accelerating and constant speed OFF falling: Moving forward jog in decelerating and stop 	R/W	UB744501	F00500
Jog starting backward of Motion CH1	 ON rising: Moving backward jog in accelerating and constant speed OFF falling: Moving backward jog in decelerating and stop 	R/W	UB744502	F00501
Jog starting forward of Motion CH2	 ON rising: Moving forward jog in accelerating and constant speed OFF falling: Moving forward jog in decelerating and stop 	R/W	UB744503	F00502
Jog starting backward of Motion CH2	 ON rising: Moving backward jog in accelerating and constant speed OFF falling: Moving backward jog in decelerating and stop 	R/W	UB744504	F00503

4.2.1.12 High-speed Counter

(1) CH1 special device

Name	Function	R/W	GP device	LP device
Using high speed counter CH1	• 1: Use	р		500000
Using high-speed counter CHT	• 0: No use	ĸ	00/44300	F00300
High-speed counter CH1 up	• 1: Use	р		F00301
counting or down counting status	• 0: No use	ĸ	06744301	
Matching high-speed counter CH1	• 1: Match	R	UB744303	F00303
with match value 1	 0: Not match 			
Matching high-speed counter CH1	• 1: Match	D	UB744304	F00304
with match value 2	 0: Not match 	ĸ		
Matching high-speed counter CH1	 1: Match 	р	1107/4205	F00005
with match value 3	 0: Not match 	ĸ	00/44305	F00303
Overflow status of high-speed	1: Overflow	р	1107//200	E00308
counter CH 1 present value	0: Not overflow	ĸ	00/44300	F00300

(2) CH2 special device

Name	Function	R/W	GP device	LP device
Light anod counter CH2	• 1: Use	п		E00210
Using high-speed counter CH2	• 0: No use	К	00/44310	F00310
High-speed counter CH2 up	• 1: Use	п	1107/4011	E00211
counting or down counting status	• 0: No use	К	UB744311	F00311
Matching high-speed counter CH2 with match value 1	 1: Match 	R	UB744313	F00313
	 0: Not match 			
Matching high-speed counter CH2	 1: Match 	п	UB744314	F00314
with match value 2	 0: Not match 	К		
Matching high-speed counter CH2	 1: Match 	п	110744245	F00315
with match value 3	 0: Not match 	К	UB/44315	
Overflow status of high-speed	1: Overflow	D	1107/4010	500040
counter CH2 present value	0: Not overflow	К	00/44318	FUU318

4.2.2 Word Special Device

4.2.2.1 PLC Model

Name	Function	R/W	GP device	LP device
PLC series and model code	 High 2 digits = Series code Low 2 digits = Model code 	R	UW74500	F100
System version	Displays the version of firmware by the range of 5 word	R	UW74501	F101
Released date of the version (Year)	Released year of the version	R	UW74506	F106
Released date of the version (Month, date)	Released month and date of the version. Displays 4 digits, high 2 digits denotes month and low 2 digits denotes date.	R	UW74507	F107

4.2.2.2 Scan Time

Name	Function	R/W	GP device	LP device
Present scan	Executing time for present scan	Б		E110
time	(Revised in every scan)	ĸ	00074510	FIIU
Min. scan	Min. scan time during the operation	Б		F111
time	(It clears when changing PLC mode or program)	ĸ	00074311	
Max. scan	Max. scan time during the operation	Б		E112
time	(It clears when changing PLC mode or program)	ĸ	00074512	F I IZ
Average scan				F112
time	Displays average scan time	ĸ	00074515	ГПЗ
Scan time	Country and displayer even time	Б		F 444
count	Counts and displays every scan time	ĸ	011/14	F114

4.2.2.3 Operation

Name	Function	R/W	GP device	LP device
Step operation generated error (At present)	Present step which has operation error (It clears when changing PLC mode or program)	R	UW74520	F120
Step operation generated error (Retaining)	First operation error step, (It clears when changing PLC mode or program)	R	UW74521	F121

4.2.2.4 Step

Name	Function	R/W	GP device	LP device
Error step	Stopped step by error at present	R	UW74530	F130
Break step	Braked step during debug mode operation (It clears when changing PLC mode or program)	R	UW74531	F131

4.2.2.5 Diagnosis

Name		Function	R/W GP device		GP device	LP device	
Self-diagnos	sis error code	Displays self-	diagnosis error code	R	UW74540	F140	
UW74540 (F140)	Туре		Cause of error				
0X0010	Watchdog err	or	Scan time excesses watc	hdog tin	ner setting va	alue	
0X0020	Memory error		When a certain area of mostate.	emory is	s the un-appr	oached	
0x0021	Battery error		When battery value is bel	ow the s	standard leve	el	
0x0022	RTC setting e	error	Disable to set RTC and R	TC ope	ration error		
0X0030 Program instruction error When the program contains instructions that are not to read and inappropriate forms.				re not able			
0X0031	Program sequ	uence error	When there is not the instructions required to process the program, such as user defined functions, label name, END, RET and IRET, etc.				
0X0040	Parameter setting error		When there are some problems in settings for common and expansion parameters.				
0X0041	Time-driven e	error	When it operates longer than the given time-driven run- time.				
0X0050	Extended mo error	dule setting	In case, the hardware constructions are different from previous parameter settings when applying power aga and changing the mode.				
0X0051	Extended mo and removing	dule attaching error	When the extended module is attached or removed in run mode.				
0x0060	Communicati	on fail error	When it is received NAK and data format not able to read.				
0x0061	Communicati error	on format	When there are some problems occurred in formats (excess of limited range etc.) and CHECK SUM while download and upload.				

4.2.2.6 Time

Name	Function	R/W	GP device	LP device
Time setting (Year)	Save the setting value of year as BCD Data	W	UW6550	F0150
Time setting (Month)	Save the setting value of month as BCD Data	W	UW6551	F0151
Time setting (Date)	Save the setting value of date as BCD Data	W	UW6552	F0152
Time setting (Hour)	Save the setting value of hour as BCD Data	W	UW6553	F0153

Name	Function	R/W	GP device	LP device
Time setting (Min)	Save the setting value of minute as BCD Data	W	UW6554	F0154
Time setting (Sec)	Save the setting value of second as BCD Data	W	UW6555	F0155
Time setting (Day)	Save the setting value of the day of week as BCD Data 0: Sunday, 1: Monday, 2: Tuesday, 3: Wednesday, 4: Thursday, 5: Friday, 6: Saturday	W	UW6556	F0156

4.2.2.7 Input Filter Setting

Name	Function	R/W	GP device	LP device
Input filter settings	Designates default input filter value by ms unit When this is 0, it does not set filter value. It applies to all of non-filter setting modules.	R/W	UW74560	F160

4.2.2.8 Time-driven Run-time Setting

Name	Function	R/W	GP device	LP device
Time-driven run-time settings	When time-driven setting flag is ON, time- driven running operates with the setting time of this register.	R/W	UW74561	F161
Watchdog timer settings	0 to 65535 (Unit: ms)	R/W	UW74562	F162

4.2.2.9 Time-driven Interrupt

Name	Function	R/W	GP device	LP device
Time-driven interrupt cycle	Time-driven interrupt cycle	R/W	UW74570	F170
settings 1	settings 1		0	
Time-driven interrupt cycle	Time-driven interrupt cycle		111/0/7/571	F171
settings 2	settings 2		00074371	1 17 1
Time-driven interrupt cycle	Time-driven interrupt cycle		111/17/1572	F172
settings 3	settings 3		00074072	1 172
Time-driven interrupt cycle	Time-driven interrupt cycle		111/7/57/	E17/
settings 4	settings 4		00074374	1 1/4
Time-driven interrupt cycle	Time-driven interrupt cycle		111/7/575	E175
settings 5	settings 5		000/45/5	F1/5
Time-driven interrupt cycle	Time-driven interrupt cycle		111/17/1576	E176
settings 6	settings 6		0114370	FI/O
Time-driven interrupt cycle	Time-driven interrupt cycle			E177
settings 7	settings 7	r./ V V	0114377	F1//
Time-driven interrupt cycle	Time-driven interrupt cycle	R/W	UW74578	F178

Name	Function	R/W	GP device	LP device
settings 8	settings 8			

4.2.2.10 Motion Control

(1) CH1 special device

Name	Function	R/W	GP device	LP device
Current position	Current position of Motion CH1	R	UW74460	F60
Current speed	Current speed of Motion CH1	R	UW74462	F62
Action No.	Current action No. of Motion CH1	R	UW74464	F64
Pattern No.	Current pattern No. of Motion CH1	R	UW74465	F65
Home position	Current home position of Motion CH1	R	UW74466	F66
Set speed	Setting speed of Motion CH1	R	UW74468	F68
Error check	Error code check of Motion CH1	R	UW74420	F20

(2) CH2 special device

Name	Function	R/W	GP device	LP device
Current position	Current position of Motion CH2	R	UW74470	F70
Current speed	Current speed of Motion CH2	R	UW74472	F72
Action No.	Current action No. of Motion CH2	R	UW74474	F74
Pattern No.	Current pattern No. of Motion CH2	R	UW74475	F75
Home position	Current home position of Motion CH2	R	UW74476	F76
Set speed	Setting speed of Motion CH2	R	UW74478	F78
Error check	Error code check of Motion CH2	R	UW74421	F21

4.2.2.11 High-speed Counter

(1) CH1 special device

Name	Function	R/W	GP device	LP device
Current position counting mode	1 phase: 1, 2 2 phase: 1,2,3,4 No use: -1	R	UW74590	F190
Current counting value	High-speed counter CH1 current counting value	R	UW74592	F192
Match value 1	High-speed counter CH1 match value 1	R	UW74596	F196
Match value 2	High-speed counter CH1 match value 2	R	UW74598	F198
Current phase type	0: NO USE (Normal input), 1: CH1 - phase1, 2: CH2 - phase1, 3: CH1,CH2 - phase1, 4: phase2	R	UW74612	F212
CH1 current total counting value	The number of total pulse input after counting starts (64 bit) Current total counting value = Total counting value + Current HSCNT counting value Initializes when using HSRST instruction or replacing PLC program	R	UW74620	F220

(2) CH2 special device

Name	Function	R/W	GP device	LP device
Current position counting mode	1 phase: 1, 2 2 phase: 1,2,3,4 No use: -1	R	UW74591	F191
Current counting value	High-speed counter CH2 current counting value	R	UW74602	F202
Match value 1	High-speed counter CH2 match value 1	R	UW74606	F206
Match value 2	High-speed counter CH2 match value 2	R	UW74608	F208
CH2 current total counting value	The number of total pulse input after counting starts (64 bit) Current total counting value = Total counting value + Current HSCNT counting value Initializes when using HSRST instruction or replacing PLC program	R	UW74628	F228

5 Instruction

5.1 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).

5.1.1 Structure by Data Type

(1) By data size

- Bit data type instruction
 It has an instruction structure of Bxxxx after Bit's B.
 Ex) BMOV, BMOVL, BMOVG etc.
- Nibble data type instruction (4bit)
 It has an instruction structure of Nxxxx after Nibble's N.
- 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) DMOV, DMOVL, DMOVG etc.
- 6) User-defined data type instruction
 It has an instruction structure of Axxxx, after Any bit's A.
 Ex) AOR, AAND, AXOR, 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 '5.1.1.1 Structure by Data Processing'.

- If there is no data processing method part: MULU, ADDU, SUBU, etc.
- If there is a data processing method part: MULLU, ADDLU, SUBLU 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): ADDB, MULB, SUBB, etc.
- If the data processing method name is 'List': ADDBL, MULBL, SUBBL, etc.

5.1.1.1 Structure by Data Processing

(1) 1:1 processing instruction

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

(2) 1:N processing instruction





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

(3) N:N processing instruction

(S)		(D)
(S)+1		(D)+1
(S)+2		(D)+2
(S)+3	→	(D)+3
:		
(S)+((N)-1)	► ►	(D)+((N)-1)

It has an instruction structure of xxxG after Group's "G", Ex) MOV $\pmb{G},\,\ldots$



Operand

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

5.2 Basic Instruction List

5.2.1 Non Processing Instruction

Instruction	Ladder symbol	Step	Operand	Run time (unit: us)		
				LP-S044	LP-S070, LP-A070, LP-A104	Page
NOP		1	2	10.25	2.5	85

5.2.2 Contact Instruction

				Run time (ON/OFF) (unit: us)		
Instruction	Ladder symbol	Step	Operand	LP-S044	LP-S070, LP-A070, LP-A104	Page
LOAD		1	1	10.625	2.5	86
LOADN	$\vdash \downarrow / \vdash$	1	1	10.25	2.5	87
LOADP	$\vdash \dashv \uparrow \vdash$	2	1	19.8	5	88
LOADF	$\vdash \dashv \checkmark \vdash$	2	1	19.8	5	89
AND		1	1	10.3	2.5	90
ANDN		1	1	10.5	2.5	91
ANDP		2	1	20.28	5	92
ANDF	$ \downarrow -$	2	1	20.28	5	93
ANDL		1	0	20.2	5	94
OR		1	1	10	2.5	95

				Run time (ON/OFF) (unit: us)		
Instruction	Ladder symbol	Step	Operand	LP-S044	LP-S070, LP-A070, LP-A104	Page
ORN		1	1	10	2.5	96
ORP		2	1	19	5	97
ORF	$\vdash \dashv \checkmark \vdash \vdash$	2	1	19	5	98
ORL		1	4	19	5	99

5.2.3 Output Instruction

				Run time (ON/OFF) (unit: us)		
Instruction	Ladder symbol	Step	Operand	LP-S044	LP-S070, LP-A070, LP-A104	Page
OUT		1	1	10.625	2.5	100
OUT Syyy.xx		1	1	10.8	2.5	101
OUTP	⊢(↑)–	2	1	18.4	5	102
OUTF	⊢(↓)−	2	1	18.4	5	103
SET	—(S)—	1	1	10	2.5	104
SET Syyy.xx	—(S)—	1	1	10	2.5	105
RST	—(R)—	1	1	10	2.5	106
5.2.4 Reversal Instruction

				Run time (ON/OFF) (unit: us)		
Instruction	Ladder symbol	Step	Operand	LP-S044	LP-S070, LP-A070, LP-A104	Page
ALT	-ALT D-	3	1	28.12 / 25.0	4.125	107
NOT	*	1	0	10.25	2.5	108

5.2.5 Stack Instruction

Instruction	Ladder symbol	Step	Operand	Run time (ON/OFF) (unit: us)		
				LP-S044	LP-S070, LP-A070, LP-A104	Page
MPUSH		1	0	10.25	2.5	109
MLOAD		1	0	10.25	2.5	110
МРОР		1	0	10.25	2.5	111

5.2.6 Exit Instruction

				Run time (ON/OFF) (unit: us)		
Instruction	Ladder symbol	Step	Operand	LP-S044	LP-S070, LP-A070, LP-A104	Page
MPUSH		1	0	10.25	2.5	109

5.3 Application Instruction list

5.3.1 Count Instruction

				Run time (ON/OFF) (unit: us)		
Instruction	Ladder symbol	Step	Operand	LP-S044	LP-S070, LP-A070, LP-A104	Page
СТU	-UCTU S R(S) N	5	2	29.5	8.75	113
CTD	DCTUS R(S)N	5	2	29.5	8.75	114
CTUD	D CTUD S D R <s> N</s>	5	2	32.0	9.375	115
CTR	UCTR S R(S) N	5	2	29.5	8.75	116

5.3.2 Timer Instruction

				Run time (ON/OFF) (unit: us)		
Instruction	Ladder symbol	Step	Operand	LP-S044	LP-S070, LP-A070, LP-A104	Page
TON	-TON SN-	5	2	28.5	8.75	117
TOFF	-TOFF SN-	5	2	27.5	8.125	118
TMR	- TMR SN-	5	2	27.5	7.5	119
TMON	-TMON S N	5	2	27.5	8.125	120
TRTG	-TRTG SN-	5	2	739.0	8.75	121

5.3.3 Control Instruction

Instruction	Ladder symbol		Operand	Run time (ON/OFF) (unit: us)		
		Step		LP-S044	LP-S070, LP-A070, LP-A104	Page
JMP	-JMP LABEL-	3	1	28.5	8.75	122
LABEL	– LABEL Label name –	3	1	10.25	2.5	123
FCALL	- FCALL LABEL-	3	1	28.5	8.75	124
FUNC	- FUNC LABEL-	3	1	28.5	8.75	125

5.3.4 Branch Instruction

				Run time (ON/OFF) (unit: us)		
Instruction	Ladder symbol	Step	Operand	LP-S044	LP-S070, LP-A070, LP-A104	Page
CALL	-CALL LABEL	3	1	28.5	8.75	126
SUBRT	-SUBRT LABEL-	3	1	28.5	8.75	127
RET		1	0	10.25	2.5	128

5.3.5 Loop Instruction

				Run time (ON/OFF) (unit: us)		
Instruction	Ladder symbol	Step	Operand	LP-S044	LP-S070, LP-A070, LP-A104	Page
FOR	-FOR N-	3	1	28.5	8.75	129
NEXT	- NEXT -	1	0	10.25	2.5	130

				Run time (ON/OFF) (unit: us)		
Instruction	Ladder symbol	Step	Operand	LP-S044	LP-S070, LP-A070, LP-A104	Page
BREAK	- BREAK -	1	0	10.25	2.5	131

5.3.6 Master Control Instruction

				Run time (ON/OFF) (unit: us)		
Instruction	Ladder symbol	Step	Operand	LP-S044	LP-S070, LP-A070, LP-A104	Page
MCS	-MCS N-	2	1	28.5	8.75	132
MCR	-MCR N-	2	1	28.5	8.75	133

5.3.7 Interrupt Instruction

	Instruction Ladder symbol Step			Run time (ON/OFF) (unit: us)		
Instruction		Operand	LP-S044	LP-S070, LP-A070, LP-A104	Page	
EI	EI	1	0	10.25	2.5	134
DI	DI	1	0	10.25	2.5	135
ETI	-ETI N-	1	1	10.25	2.5	136
EEI	-EEI N-	1	1	10.25	2.5	137
DTI		1	1	10.25	2.5	138
DEI		1	1	10.25	2.5	139
TINT		1	1	10.25	2.5	140

				Run time (ON/OFF) (unit: us)		
Instruction	Ladder symbol	Step	Operand	LP-S044	LP-S070, LP-A070, LP-A104	Page
EINT		1	1	10.25	2.5	141
IRET		1	0	10.25	2.5	142

5.3.8 Watchdog Timer

				Run time (ON/OFF) (unit: us)		
Instruction	Ladder symbol	Step	Operand	LP-S044	LP-S070, LP-A070, LP-A104	Page
WDT	- ирт -	1	0	10.25	2.5	143

5.3.9 Input Comparison Instruction

			Run time (ON/OFF) (unit: us)			
Instruction	Ladder symbol	Step	Operand	LP-S044	LP-S070, LP-A070, LP-A104	Page
LOAD=	= s1 s2	5	2	26.87	8.125	144
LOAD>	→ S1 S2	5	2	26.87	8.75	145
LOAD<	< S1 S2	5	2	26.87	8.75	146
LOAD<>	<> S1 S2	5	2	26.87	8.75	147
LOAD>=		5	2	26.87	8.75	148
LOAD<=	<= S1 S2	5	2	26.87	8.75	149
DLOAD=	= S1 S2 -	5	2	29.0	8.125	150
DLOAD>	> s1 s2 -	5	2	29.0	8.75	151
DLOAD<	< s1 s2 -	5	2	29.0	8.75	152
DLOAD<>	<> S1 S2 -	5	2	29.0	8.75	153
DLOAD>=	>= S1 S2 -	5	2	29.0	9.375	154
DLOAD<=		5	2	29.0	9.375	155
AND=	- = S1 S2 -	5	2	28.5	10	156
AND>	- → S1 S2 -	5	2	28.5	10	157

				Run time (ON/OFF) (unit: us)		
Instruction	Ladder symbol	Step	Operand	LP-S044	LP-S070, LP-A070, LP-A104	Page
AND<	- < s1 s2 -	5	2	28.5	10	158
AND<>	- <> s1 s2 -	5	2	28.5	10.625	159
AND>=	- >= S1 S2 -	5	2	28.5	10.625	160
AND<=	_ <= S1 S2 -	5	2	28.5	10.625	161
DAND=	- = S1 S2 -	5	2	29.5	10.625	162
DAND>	- → S1 S2 -	5	2	29.5	10.625	163
DAND<	_ < S1 S2	5	2	29.5	10.625	164
DAND<>	- <> S1 S2 -	5	2	29.5	10.625	165
DAND>=	- >= S1 S2 -	5	2	29.5	10.635	166
DAND<=	- <= S1 S2 -	5	2	29.5	10.625	167
OR=	Ц = s1 s2 -	5	2	28.0	10.625	168
OR>	Ц > s1 s2 -	5	2	28.0	10.625	169
OR<	Ц < s1 s2 -	5	2	28.0	10.625	170
OR<>	Ц <> S1 S2 ⊨	5	2	28.0	10.625	171

				Run time (ON/OFF) (unit: us)		
Instruction	Ladder symbol	Step	Operand	LP-S044	LP-S070, LP-A070, LP-A104	Page
OR>=	Ц >= S1 S2	5	2	28.0	10.625	172
OR<=	Ц <= S1 S2 –	5	2	28.0	10.625	173
DOR=	Ц = s1 s2 Н	5	2	29.0	10.625	174
DOR>	Ц → s1 s2 H	5	2	29.0	10.625	175
DOR<	Ц < s1 s2 µ	5	2	29.0	10.625	176
DOR<>	Ц <> s1 s2 ↓	5	2	29.0	10.625	177
DOR>=		5	2	29.0	10.625	178
DOR<=	Ц <= S1 S2 ⊭	5	2	29.0	10.625	179

5.3.10 Comparison Instruction

				Run time (O		
Instruction	Ladder symbol	Step	Operand	LP-S044	LP-S070, LP-A070, LP-A104	Page
CMP	-CMP S1 S2 D-	7	3	49.35 / 34.3	11.375	180
DCMP	DCMP S1 S2 D	7	3	51.1 / 35.35	12.25	181
				when H: 3, 54.6 when H: 15,	when H: 3, 16.625 when H: 15,	
ACMP	ACMP S1 S2 D N	7	4	74.2 when H: 30, 94.5	17.5 when H: 30, 21	182
				when not running, 39.2	when not running, 16.625	
				when N: 2, 62.1	when N: 2, 18	
			4	when N: 4, 85.5	when N: 4, 21.375	
CMPL	-CMPL S1 S2 D N	9		when N: 8, 124.2	when N: 8, 29.25	183
				when N: 16, 211.5	when N: 16, 45	
				when not running, 41.85	when not running, 13.5	
				when N: 2, 66.6	when N: 2, 22.5	
				when N: 4, 88.2	when N: 4, 25.875	
DCMPL	DCMPL S1 S2 D N	9	4	when N: 8, 129.6	when N: 8, 32.625	184
				when N: 16, 214.2	when N: 16, 39.375	
				when not running, 43.2	when not running, 15.75	
BWCMP	BWCMP S1 S2 D N	9	4	49.35	11.375	185
DBWCMP	-DBWCMP S1 S2 D N	9	4	51.1	12.25	187

5.3.11 Transmission Instruction

				Run time (O		
Instruction	Ladder symbol	Step	Operand	LP-S044	LP-S070, LP-A070, LP-A104	Page
BMOV	-BMOV S D	5	2	19.5 / 19.5	6.875	189
MOV	-MOV S D	5	2	19.5 / 19.5	7.5	190
DMOV	- DMOV S D	5	2	22.35 / 22.35	8.75	191
BMOVL	- BMOVL S D N	7	3	when N: 2, 35 when N: 4, 37.8 when N: 8, 44.1 when N: 16, 56 when not running, 32.9	when N: 2, 13.125 when N: 4, 16.625 when N: 8, 20.125 when N: 16, 16.625 when not running, 9.625	192
MOVL	- MOVL S D N	7	3	when N: 2, 29.4 when N: 4, 31.5 when N: 8, 33.6 when N: 16, 37.8 when not running, 27.3	when N: 2, 9.625 when N: 4, 12.25 when N: 8, 13.125 when N: 16, 15.75 when not running, 9.625	193
DMOVL	- DMOVL S D N	7	3	when N: 2, 33.32 when N: 4, 35.35 when N: 8, 38.5 when N: 16, 45.5 when not running, 31.5	when N: 2, 10.5 when N: 4, 12.25 when N: 8, 14 when N: 16, 18.375 when not running, 9.625	194
BMOVG	- BMOVG S D N	7	3	when N: 2, 37.1 when N: 4, 41.6 when N: 8, 449.7	when N: 2, 12.25 when N: 4, 13.125 when N: 8, 16.625	195

				Run time (O		
Instruction	Ladder symbol	Step	Operand	LP-S044	LP-S070, LP-A070, LP-A104	Page
				when N: 16, 65.8 when not running, 32.9	when N: 16, 18.375 when not running, 11.375	
MOVG	-MOVG S D N-	7	3	when N: 2, 27.3 when N: 4, 28.35 when N: 8, 30.1 when N: 16, 37.1 when not	when N: 2, 10.5 when N: 4, 11.375 when N: 8, 13.125 when N: 16, 15.75 when not	196
DMOVG	- DMOVG S D N	7	3	26.6 when N: 2, 28.35 when N: 4, 30.38 when N: 8, 33.32 when N: 16, 39.2 when not running, 26.6	9.625 when N: 2, 10.5 when N: 4, 11.375 when N: 8, 13.125 when N: 16, 14 when not running, 8.75	197
BCMOV	-BCMOV S D	5	2	19.5 / 19.5	6.875	198
СМОУ	-CMOV S D	5	2	19.5 / 19.5	7.5	199
DCMOV	-DCMOV S D	5	2	22.35 / 22.35	8.75	200

5.3.12 Exchange Instruction

				Run time (ON/OFF) (unit: us)		
Instruction	Ladder symbol	Step	Operand	LP-S044	LP-S070, LP-A070, LP-A104	Page
хсн	- ХСН S D-	5	2	19.5 / 18.0	6.875	201
DXCH	-DXCH S1 S2-	5	2	20.1 / 18.0	7.5	202
АХСН	AXCH S1 S2 N	7	3	25.45	9.2	203
SWAP	- SWAP D	3	1	12.9 / 11.9	4.5	204
DSWAP	- DSWAP D	3	1	13.35 / 12.3	4.875	205

5.3.13 Rotation Instruction

				Run time (C		
Instruction	Ladder symbol	Step	Operand	LP-S044	LP-S070, LP-A070, LP-A104	Page
ROR	ROR S C	5	2	25.5 / 21.5	8.125	206
DROR	- DROR S C-	5	2	25.5 / 21.5	8.125	207
AROR	- AROR S N C-	7	3	30.24	9.57	208
RORC	- RORC S C	5	2	27 / 21.5	8.75	209
DRORC	- DRORC S C	5	2	27 / 21.5	8.75	210
ARORC	- AROSC S N C	7	3	30.24	9.57	211
ROL	-ROL S C	5	2	25.5 / 21.5	8.125	212

				Run time (ON/OFF) (unit: us)		
Instruction	Ladder symbol	Step	Operand	LP-S044	LP-S070, LP-A070, LP-A104	Page
DROL	- DROL S C	5	2	25.5 / 21.5	8.125	213
AROL	- AROL S N C	7	3	25.45	9.2	214
ROLC	- ROLC S C	5	2	27 / 21.5	8.75	215
DROLC	- DROLC S C -	5	2	27 / 21.5	8.75	216
AROLC	- AROLC S N C	7	3	30.24	9.57	217

5.3.14 Movement Instruction

				Run time ((unit: us)		
Instruction	Ladder symbol	Step	Operand	LP-S044	LP-S070, LP-A070, LP-A104	Page
SFTR	- SFTR S N	9	2	38.75	10.55	218
ASFTR	-ASFTR S N1 N2-	9	3	43.2 / 35.55	12.375	219
SFTL	- SFTL S N1 N2	9	2	38.75	10.55	220
ASFTL	-ASFTL S N1 N2-	9	3	43.2 / 35.55	12.375	221
				when N1:	when N1:	
			3	8, 40.5	8, 12.375	
				when N1:	when N1:	
				16, 45.5	16, 13.5	
WOETD		0		when N1:	when N1:	2 2 2
WOFIR		5		24, 50.4	24, 14.625	222
				when N1:	when N1:	
				32, 54	32, 15.75	
				when not running, 33.3	when not running, 11.25	
				when N1:	when N1:	
				8, 40.5	8, 12.375	
				when N1:	when N1:	
				16, 45.5	16, 13.5	
				when N1:	when N1:	
WSFTL	WSFTL S N1 N2	9	3	24, 50.4	24, 14.625	223
				when N1:	when N1:	
				32, 54	32, 15.75	
				when not	when not	
				running,	running,	
				33.3	11.25	

5.3.15 Arithmetic Operation Instruction

				Run time (ON/OFF) (unit: us)		
Instruction	Ladder symbol	Step	Operand	LP-S044	LP-S070, LP-A070, LP-A104	Page
ADD	-ADD S1 S2 D	7	3	37.1 / 32.2	11.375	224
DADD	-DADD S1 S2 D-	7	3	52.36 / 38.36	13.125	225
ADDU	-ADDU S1 S2 D-	7	3	37.1 / 32.2	12.25	226
DADDU	- DADDU S1 S2 D	7	3	52.36 / 38.36	14	227
ADDL	-ADDL S1 S2 D N	9	4	37.1	12.25	228
DADDL	- DADDL S1 S2 D N	9	4	52.36	14	229
ADDLU	-ADDLU S1 S2 D N	9	4	52.36	14	230
DADDLU	- DADDLU S1 S2 D N-	9	4	62.38	16	231
SUB	-SUB S1 S2 D	7	3	37.1 / 32.2	11.375	232
DSUB	-DSUB S1 S2 D-	7	3	40.32 / 36.33	12.25	233
SUBU	-SUBU S1 S2 D-	7	3	37.1 / 32.2	11.375	234
DSUBU	-DSUBU S1 S2 D	7	3	40.32 / 36.33	12.25	235
SUBL	-SUBL S1 S2 D N-	9	4	37.1	11.375	236
DSUBL	-DSUBL S1 S2 D N-	9	4	40.32	12.25	237

				Run time ((unit: us)	ON/OFF)	
Instruction	Ladder symbol	Step	Operand	LP-S044	LP-S070, LP-A070, LP-A104	Page
SUBLU	-SUBLU S1 S2 D N-	9	4	40.32	12.25	238
DSUBLU	-DSUBLU S1 S2 D N-	9	4	52.36	16	239
MUL	-MUL S1 S2 D-	7	3	37.1 / 32.2	12.25	240
DMUL	-DMUL S1 S2 D	7	3	53.34 / 38.36	14	241
MULU	-MULU S1 S2 D	7	3	37.1 / 32.2	12.25	242
DMULU	-DMULU S1 S2 D-	7	3	53.34 / 38.36	14.875	243
MULL	-MULL S1 S2 D N-	9	4	37.1	12.25	244
DMULL	- DMULL S1 S2 D N	9	4	53.34	14.875	245
MULLU	-MULLU S1 S2 D N	9	4	53.34	14.875	246
DMULLU	- DMULLU S1 S2 D N	9	4	62.28	16	247
DIV	– DIV S1 S2 D–	7	3	46.2 / 34.3	13.125	248
DDIV	-DDIV S1 S2 D	7	3	52.36 / 38.36	14	249
DIVU	-DIVU S1 S2 D	7	3	46.2 / 34.3	13.125	250
DDIVU	-DDIVU S1 S2 D-	7	3	52.36 / 38.36	13.125	251

			Run time (ON/OFF) (unit: us)			
Instruction	Ladder symbol	Step	Operand	LP-S044	LP-S070, LP-A070, LP-A104	Page
DIVL	-DIVL S1 S2 D-	9	4	52.36	14	252
DDIVL	-DDIVL S1 S2 D N	9	4	62.28	16	253
DIVLU	-DIVLU S1 S2 D N-	9	4	62.28	16	254
DDIVLU	- DDIVLU S1 S2 D N-	9	4	73.22	18.46	255
INC		3	1	13.8 / 12.3	4.875	256
DINC		3	1	14.37 / 12.87	4.875	257
DEC	- DEC D	3	1	13.8 / 12.3	4.875	258
DDEC	- DDEC D	3	1	14.37 / 12.87	4.875	259
ADDB	-ADDB S1 S2 D	7	3	67.2 / 32.2	13.125	260
DADDB	- DADDB S1 S2 D	7	3	110.32 / 35.35	14	261
ADDBL	-ADDBL S1 S2 D N	9	4	110.32	14	262
DADDBL	- DADDBL S1 S2 D N-	9	4	132.21	18	263
SUBB	-SUBB S1 S2 D N-	7	3	41.3 / 32.2	13.125	264
DSUBB	-DSUBB S1 S2 D	7	3		14	265

				Run time ((unit: us)	ON/OFF)	
Instruction	Ladder symbol	Step	Operand	LP-S044	LP-S070, LP-A070, LP-A104	Page
SUBBL	-SUBBL S1 S2 D	9	4	44.28	14	266
DSUBBL	-SUBBL S1 S2 D	9	4	53.28	16.55	267
MULB	-MULB S1 S2 D	7	3	95.2 / 32.2	13.125	268
DMULB	-DMULB S1 S2 D-	7	3		21	269
MULBL	-MULBL S1 S2 D N-	9	4	110.5	25.3	270
DMULBL	- DMULBL S1 S2 D N-	9	4	132	28.5	271
DIVB	-DIVB S1 S2 D-	7	3	82.6 / 32.2	14	272
DDIVB	- DDIVB S1 S2 D-	7	3		14	273
DIVBL	-DIVBL S1 S2 D N-	9	4	95.3	36.2	274
DDIVBL	- DDIVBL S1 S2 D N-	9	4	110	55.3	275
INCB	-INCB D-	3	1	39.9 / 12.9	6	276
DINCB	- DINCB D-	3	1		7.5	277
DECB	-DECB D-	3	1	39.9 / 12.9	6	278
DDECB	- DDECB D	3	1		6.375	279

5.3.16 Logical Operation Instruction

				Run time (ON/OFF) (unit: us)		
Instruction	Ladder symbol	Step	Operand	LP-S044	LP-S070, LP-A070, LP-A104	Page
WAND	-WAND S1 S2 D	7	3	23.25	8.4	280
DAND	-DAND S1 S2 D	7	3	23.25	8.4	281
AAND	AAND S1 S2 D N	9	4	38.44	10.5	282
WANDL	-WANDL S1 S2 D N	9	4	28.1	9.3	283
DANDL	- DANDL S1 S2 D N	9	4	35.2	10.2	284
WOR	-WOR S1 S2 D	7	3	23.25	8.4	285
DOR	- DOR S1 S2 D	7	3	23.25	8.4	286
AOR	AOR S1 S2 D	9	4	35.2	10.2	287
WORL	- WORL S1 S2 D	9	4	28.1	9.3	288
DORL	- DORL S1 S2 D N	9	4	28.1	9.3	289
XOR	-XOR S1 S2 D	7	3	23.25	8.4	290
DXOR	DXOR S1 S2 D	7	3	28.1	9.3	291
AXOR	AXOR S1 S2 D N	9	4	35.2	10.2	292
XORL	- XORL S1 S2 D N	9	4	35.2	10.2	293

				Run time (ON/OFF) (unit: us)		
Instruction	Ladder symbol	Step	Operand	LP-S044	LP-S070, LP-A070, LP-A104	Page
DXORL	- DXORL S1 S2 D N-	9	4	38.44	10.5	294
XNR	-XNR S1 S2 D	7	3	23.25	8.4	295
DXNR	DXNR S1 S2 D	7	3	28.1	9.3	296
AXNR	AXNR S1 S2 D N	9	4	38.44	10.5	297
XNRL	-XNRL S1 S2 D N	9	4	23.25	8.4	298
DXNRL	- DXNRL S1 S2 D N-	9	4	28.1	9.3	299

5.3.17 BIN/BCD Instruction

Instruction	Ladder symbol	Step	Operand	Run time (ON/OFF) (unit: us)		
				LP-S044	LP-S070, LP-A070, LP-A104	Page
BIN2BCD	-BIN2BCD S D	5	2	22.38	8.4	300
DBIN2BCD	- DBIN2BCD S D	5	2	22.38	8.4	301
BCD2BIN	BCD2BIN S D	5	2	22.38	8.4	302
DBCD2BIN	- DECD2BIN S D	5	2	22.38	8.4	303

5.3.18 String Conversion Instruction

				Run time (ON/OFF) (unit: us)		
Instruction	Ladder symbol	Step	Operand	LP-S044	LP-S070, LP-A070, LP-A104	Page
BIN2HASC	BIN2HASC S D	5	2	22.38	8.4	304
DBIN2HASC	- DBIN2HASC S D	5	2	25.38	8.8	305
HASC2BIN	HASC2BIN S D	5	2	22.38	8.4	306
DHASC2BIN	- DHASC2BIN S D	5	2	25.38	8.8	307
BCD2DASC	-BCD2DASC S D	5	2	22.38	8.4	308
DBCD2DASC	- DBCD2DASC S D	5	2	25.38	8.8	309
DASC2BIN	- DASC2BIN S D	5	2	25.38	8.8	310
DDASC2BIN	- DDASC2BIN S D	5	2	35.24	9.6	3 1 1

				Run time (ON/OFF) (unit: us)		
Instruction	Ladder symbol	Step	Operand	LP-S044	LP-S070, LP-A070, LP-A104	Page
STR2ASC	-STR2ASC S D	7	2	38.5	10	312
DASC2BCD	-DASC2BCD S D	5	2	35.24	9.6	313
DDASC2BCD	-DDASC2BCD S D-	5	2	25.38	8.8	314
BIN2DASC	-BIN2DASC S D	5	2	22.38	8.4	3 1 5
DBIN2DASC	-DBIN2DASC S D	5	2	25.38	8.8	316

5.3.19 Code Conversion Instruction

Instruction	Ladder symbol		Operand	Run time (ON/OFF) (unit: us)		
		Step		LP-S044	LP-S070, LP-A070, LP-A104	Page
GRY2BIN	-GRY2BIN S D	5	2	22.38	8.4	317
DGRY2BIN	- DGRY2BIN S D-	5	2	25.38	8.8	318
BIN2GRY	-BIN2GRY S D	5	2	22.38	8.4	319
DBIN2GRY	- DBIN2GRY S D	5	2	25.38	8.8	320

5.3.20 Sign Reversal Instruction

				Run time (ON/OFF) (unit: us)		
Instruction	Ladder symbol	Step	Operand	LP-S044	LP-S070, LP-A070, LP-A104	Page
NEG	– NEG D–	3	1	23.4	8.2	321
DNEG	DNEG D	3	1	23.4	8.2	322

5.3.21 Data Conversion Instruction

				Run time (ON/OFF) (unit: us)		
Instruction	Ladder symbol	Step	Operand	LP-S044	LP-S070, LP-A070, LP-A104	Page
DECO	-DECO S D N-	7	3	28.8	9.2	323
ENCO	-ENCO S D N	7	3	28.8	9.2	324
EXT	-EXT D-	3	1	23.4	8.2	325

5.3.22 Refresh Instruction

				Run time (ON/OFF) (unit: us)		
Instruction	Ladder symbol	Step	Operand	LP-S044	LP-S070, LP-A070, LP-A104	Page
REF	- REF D N	5	2	23.4	8.2	326

5.3.23 Display Instruction

				Run time ((unit: us)	Run time (ON/OFF) (unit: us)	
Instruction	Ladder symbol	Step	Operand	LP-S044	LP-S070, LP-A070, LP-A104	Page
SEG	-SEG S D N-	7	3	23.4	8.2	327

5.3.24 Clock Instruction

				Run time ((unit: us)		
Instruction	Ladder symbol	Step	Operand	LP-S044	LP-S070, LP-A070, LP-A104	Page
ТСМР		7	5	38.5	10	329
TADD	-TADD S1 S2 D-	7	3	38.5	10	330
TSUB	-TSUB S1 S2 D	7	3	38.5	10	331
TRD	- TRD D	3	1	52.5	12	332
TWR	- TWR D	3	1	52.5	12	333
HOUR	HOUR S D1 D2	7	3	25.24	10.5	334
TZCP	-TZCP S1 S2 S3 D-	9	4	52.5	12	3 3 5

5.3.25 Motion Instruction

Instruction	Ladder symbol	Step	Operand	Run time (ON/OFF) (unit: us) LP-S070, LP-A070, LP-A104	Page
MTVDM	MTVDM S0 S1 S2 S3 S4 S5	9	6	15.75	337
MTPDM		9	6	18	338
MTIDM	MTIDM S0 S1	5	2	9	339
MTMEC	- MTMEC SO	5	1	6.75	340
MTEMS	MTEMS SO	5	1	9	341
МТСРР	MTCPP S0 S1	5	2	9	3 4 2
MTFOS	- MTFOS S0	5	1	6.75	343
MTSRS	- MTSRS S0	5	1	6.75	344
МТОВС	— MTOBC SO	5	1	6.75	345
MTOVV	MTOVV S0 S1	5	2	9	346
MTOVP	MTOVP S0 S1	5	2	10.125	347
MTIPT	MTIPT SO S1 S2 S3	7	4	13.5	3 4 8
MTUAI	MTUAI SO S1	5	2	11.25	349

5.3.26	High-speed	Counter	Instruction
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Instruction	Ladder symbol	Step	Operand	Run time (ON/OFF) (unit: us) LP-A070, LP-A104	Page
HSCNT	HSCNT SO S1 S2 D S3	7	5	14	350
HSSET	HSSET SO S1 S2	6	3	13.5	352
HSRST	HSRST SO S1	7	2	13.5	353

5.4 Basic Instruction

5.4.1 Non Processing Instruction (NOP)

Non
processing
instructionApplicable modelLP-S044, LP-S070,
LP-A070, LP-A104

1. It is non processing instruction.

2. It is available only for mnemonic program.

P

5.4.2 Contact Instruction (LOAD)

C in:	Contact struction	LOAD	S	Арр	licab	le mo	odel	
				LP-S044, LP-S070,),		
				LP-/	A070	, LP-	A104	ł
OP	DATA type	Available device	e / Description / Range					
		X, Y, M, S, T, C, F	, UB	Erro	Zero	Carı	Bori	Step
S	BIT	Contact of bit dev	ice	, F	Ŭ	2	WO.	0
		Not applicable						1

<Ladder>

X00000		Y00000
IE		
	·	

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



r-

1

5.4.3 Contact Instruction (LOADN)

Contact instruction		LOADN S		Applicable model					
				LP-	S044	ŀ, LP∙	-S07	0,	
				LP-/	A070), LP·	-A104	4	
OP	DATA type	Available device	e / Description / Range						
		X, Y, M, S, T, C, F,	UB	Erro	Zerc	Can	Borr	Step	
S	BIT	Contact of bit devi	ce	Ĩ,	Ŭ	Y	OW		
		Not applicable						1	

<Ladder>

X00000	Y00000

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



P

5.4.4 Contact Instruction (LOADP)

Contact instruction		LOADP	S	Арр	licab	le mo	odel	
				LP-S044, LP-S070,		0,		
				LP-/	A070	, LP-	·A104	4
OP	DATA type	Available device	e / Description / Range					
		X, Y, M, S, T, C, F,	, UB	Erro	Zerc	Can	Borr	Step
S	BIT	Contact of bit devi	ice	r		\sim	WO.	
		Not applicable						2

<Ladder>



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



5.4.5 Contact Instruction (LOADF)

in	Contact struction	LOADF	S	Арр	licab	le mo	odel	
				LP-S	S044	, LP-	·S070	,
				LP-/	4070	, LP-	A104	
OP	DATA type	Available devic	e / Description / Range					
		X, Y, M, S, T, C, F	, UB	Erro	Zerc	Can	Borr	Step
S	ΒΙΤ	Contact of bit dev	vice	, F	0	γ	Ŵ	0
		Not applicable						2

<Ladder>



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

<Time chart>



r

5.4.6 Contact Instruction (AND)

Contact instruction		AND	S	Арр	licable model
				LP-S044, LP-S070,	
				LP-/	A070, LP-A104
OP	DATA type	Available device	e / Description / Range		
		X, Y, M, S, T, C, F	, UB	Erro	Step Borr Carr
S	віт	Contact of bit dev	ice	-	
		Not applicable			

<Ladder>



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



5.4.7 Contact Instruction (ANDN)

ontact truction	ANDN	S	Арр	licable model
			LP-	S044, LP-S070,
			LP-/	A070, LP-A104
DATA type	Available device	e / Description / Range		
	X, Y, M, S, T, C, F	, UB	Erro	Ster Born Car
BIT	Contact of bit dev	ice	or	o ry row
	Not applicable			1
	DATA type	Ontact pructionANDNOATA typeAvailable device X, Y, M, S, T, C, FBITContact of bit dev Not applicable	ANDNSDATA typeAvailable device / Description / RangeX, Y, M, S, T, C, F, UBBITContact of bit deviceNot applicable	ANDN S App LP

<Ladder>



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

<Time chart>



5.4.8 Contact Instruction (ANDP)



<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.



5.4.9 Contact Instruction (ANDF)

(ins	Contact struction	ANDF	S	App LP-\$	licab S044	ole m I, LP [.]	odel -S07	0,
				LP-/	A070), LP	-A10	4
OP	DATA type	Available device	e / Description / Range					
		X, Y, M, S, T, C, F	, UB	Erro	Zero	Car	Bori	Step
S	віт	Contact of bit devi	ice	Ÿ	0	Ż	OM	0
		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>



Applicable model

LP-S044, LP-S070, LP-A070, LP-A104

5.4.10 Contact Instruction (ANDL)



<Mnemonic & Ladder>

Step	Instruction	0P1	0P2
0	LOAD	×00000	
1	LOAD	X00001	
2	OR	X00002	
3	ANDL		
4	OUT	Y00000	
5	END		

X00001

X00002

Executes the AND operation between the block and the block.

[Note]

Y00000

END

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

<Time chart>

X00000

-

H


5.4.11 Contact Instruction (OR)

Contact instruction		OR	S	Applicable model				
				LP-S044, LP-S070,		D,		
				LP-	A070	, LP-	A104	4
OP	DATA type	Available dev	ice / Description / Range					
		X, Y, M, S, T, C	, F, UB	Erro	Zero	Carı	Borr	Step
S	BIT	Contact of bit d	evice	r		2	MO.	
		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>



5.4.12 Contact Instruction (ORN)

C ins	Contact struction	ORN	S	Арр	licabl	e mo	odel	
				LP-	S044,	LP-	S070),
				LP-/	A070,	LP-	A104	F I
OP	DATA type	Available device	e / Description / Range					
		X, Y, M, S, T, C, F	, UB	Erro	Zer	Car	Bor	Ste
S	ΒΙΤ	Contact of bit dev	ice	or	0	Ż	ſOW	0
		Not applicable						1
S	BIT	Contact of bit dev Not applicable	ice	9r	0	2	row	1

<Ladder>

×00000	Y00000
X00001	

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



5.4.13 Contact Instruction (ORP)

Contact instruction		ORP	S	Applicable model				
				LP-S044, LP-S070,		О,		
				LP-/	4070), LP-	·A104	4
OP	DATA type	Available device	e / Description / Range					
		X, Y, M, S, T, C, F	, UB	Erro	Zero	Carı	Borr	Step
S	віт	Contact of bit dev	ice	ř		2	MO.	
		Not applicable						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>



5.4.14 Contact Instruction (ORF)

Contact Istruction	ORF	S	Арр	licable model
			LP-	S044, LP-S070,
			LP-	A070, LP-A104
DATA type	Available devi	ce / Description / Range		
	X, Y, M, S, T, C,	F, UB	Erro	Step Borr Carr
ΒΙΤ	Contact of bit de	evice	r	o là
	Not applicable			2
	Contact Instruction	Contact ORF DATA type Available devi X, Y, M, S, T, C, Contact of bit devi BIT Contact of bit devi Not applicable Not applicable	Contact Instruction ORF S DATA type Available device / Description / Range K, Y, M, S, T, C, F, UB Contact of bit device BIT Contact of bit device Not applicable Not applicable	Contact Instruction ORF S Applicable DATA type Available device / Description / Range LP- DATA type Available device / Description / Range Image: Contact of bit device BIT Contact of bit device Image: Contact of bit device Not applicable Image: Contact of bit device Image: Contact of bit device

<Ladder>

×00000		Y00000

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.



5.4.15 Contact Instruction (ORL)

Contact
instructionApplicable modelLP-S044, LP-S070,
LP-A070, LP-A104

<Mnemonic & Ladder>

Step	Instruction	0P1	0P2
0	LOAD	×00000	
1	AND	X00001	
2	LOAD	X00002	
3	AND	X00003	
4	ORL		
5	OUT	Y00000	
6	END		

X00001

X00003

H

H

Η.

Н.

Executes the OR operation between the block and the block.

[Note]

Y00000

END

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

<Time chart>

X00000

X00002

H



P

5.4.16 Output Instruction (OUT)

Output instruction		OUT	D	Applicable model				
				LP-	S044	, LP-	·S070	D,
				LP-/	A070	, LP-	A104	4
OP	DATA type	Available device	e / Description / Range					
		Y, F, S, M, UB		Errc	Zero	Car	Bori	Step
D	BIT	ON/OFF contact o	of device	Ÿ	0	Ż	, MO,	0
		Not applicable						1

<Ladder>

X00000		Y00000
	· · · · · · · · · · · · · · · · · · ·	

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



5.4.17 Output Instruction (OUT Syyy.xx)

Output instruction		OUT Syyy.xx D	Apr LP- LP-	olicat S044 A070	ole m 1, LP·), LP·	odel -S07(-A10₄), 4
OP	DATA type	Available device / Description / Range					
		S	Erro	Zer	Car	Bor	Ste
D	віт	yyy is group number(0 to 255), xx is step number (0 to 99)	or	0	Ŋ	row	σ
		Not applicable					1

<Ladder>

X00001	S000.01
X00002	S000.02
X00003	S000.03
X00000	\$000.00

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>



5.4.18 Output Instruction (OUTP)



<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.



5.4.19 Output Instruction (OUTF)

(ins	Output struction	OUTF	D	Apr LP-	olicab S044	le mo	odel -S07(),
				LP-	A070), LP-	·A104	4
ОР	DATA type	Available device	e / Description / Range					
		Y, F, S, M, UB		Erro	Zero	Car	Bori	Step
D	BIT	Contact to be ON	for one scan on the falling edge of a pulse	or	0	Ż	, OM	0
		Not applicable						2

<Ladder>

×00000	Y00000
I	
	÷

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>



P

5.4.20 Output Instruction (SET)

Output instruction		SET D		Applicable model		
				LP-S	S044, LP-S070,	
_				LP-/	A070, LP-A104	
OP	DATA type	Available device / Descripti	on / Range			
		Y, F, S, T, C, M, UB		Erro	Step Born Car	
D	віт	Contact to be maintained ON s	tatus	ř	O VI	
		Not applicable			1	

<Ladder>

X0000	D	-	M00000
_		 - + -	
		-	END
	· ÷ ·	 	<u>с </u>

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.



5.4.21 Output Instruction (SET Syyy.xx)

i	Output nstruction	SET Syyy.xx	D	App LP-	olicat S044	ole mo I, LP-	odel -S07(Ο,
				LP-	A070), LP-	-A104	4
OP	DATA type	Available device	e / Description / Range					
		S		Erro	Zer	Car	Bon	Ste
D	BIT	yyy is group num	per(0 to 255), xx is step number (0 to 99)	or	0	γ	row	σ
		Not applicable						1
	<u> </u>	rior applicable						Ŀ

<Ladder>

S000.01
(S)
S000.02
S000.00

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 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>



5.4.22 Output Instruction (RST)

(ins	Output struction	RST	D	Арр	blicable model
				LP-	S044, LP-S070,
_				LP-/	A070, LP-A104
OP	DATA type	Available device	e / Description / Range		
		Y, F, S, T, C, M, U	В	Erro	Step Borr Carr
D	ΒΙΤ	Contact to be mai	ntained OFF status)r	o v.
		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 retains OFF.



5.4.23 Reversal Instruction (ALT)

Reversal instruction		ALT D				Applicable model					
				LP-	S044	, LP-	-S07(0,			
				LP-/	4070), LP-	A104	4			
OP	DATA type	Available device	e / Description / Range								
		Y, F, M ,UB		Erro	Zero	Car	Bon	Step			
D	BIT	Data address to e	execute the operation	٥r	0	Ż	NO.	0			
		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>



5.4.24 Reversal Instruction (NOT)



<Ladder>

X00000		Y00000
	····	

1. Transfers input by reversing.

2. A contact circuit is reversed as B contact circuit, B contact circuit is reversed as A contact circuit.



5.4.25 Stack Instruction (MPUSH)

Stack
instructionApplicable modelLP-S044, LP-S070,
LP-A070, LP-A104

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

5.4.26 Stack Instruction (MLOAD)

Stack instruction MLOAD

Applicable model LP-S044, LP-S070, LP-A070, LP-A104

Loads the value stored in the stack.

5.4.27 Stack Instruction (MPOP)

Stack
instructionMPOPApplicable modelLP-S044, LP-S070,
LP-A070, LP-A104

Removes the data in the stack after reading it.

5.4.28 Exit Instruction (END)

Exit instruction END

Applicable model LP-S044, LP-S070, LP-A070, LP-A104

Exits the program.

5.5 Application Instruction

5.5.1 Counter Instruction (CTU)

Counter instruction		ounter truction	CTU S		N	Арр	licab	le mo	odel	
						LP-S	S044	, LP-	·S070	D,
						LP-A	4070	, LP-	·A104	4
	OP	DATA type	Available device /	Desc	cription / Range					
Ī			C, UW			Erro	Zer	Car	Bor	Ste
	S	WORD	Counter contact you	want	t to use	Ÿ	0	ŗ	row	σ
			0(h0000) to 65535(ł	FFFF	=)					5
			X, Y, M, S, T, C, D, Z	Z, F, L	JW, integer					
	Ν	WORD	Setting value of cou	nter						
			0(h0000) to 65535(h	FFFF	-)					
-										

<Ladder>

X00000	I I	1		
	I I I I	1	UCTU	C000
X00001	τ			_
		1	R <s></s>	<u> </u>
	,			I

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>



5.5.2 Counter Instruction (CTD)



<Ladder>

мооооо	i i		
<u> </u>		DCTD	C000
M00001			_
_	· · · · · · · · · · · · · · · · · · ·	R <s></s>	<u> </u>
			•

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" .



5.5.3 Counter Instruction (CTUD)

C ins	Counter struction	CTUD	S	Ν	Арр	licat	ole m	odel	
					LP-	4070	+, ∟⊢·), LP·	-3070 -A104	,
OP	DATA type	Available device	/ Des	cription / Range					
		C, UW			Erro	Zer	Car	Bon	Stel
S	WORD	Counter contact yo	ou wan	t to use	Уr	0	Ż	row	0
		0(h0000) to 65535	(hFFFI	=)					5
		X, Y, M , S, T, C, D	, Z, F,	UW, integer					
Ν	WORD	Setting value of co	unter						
		0(h0000) to 65535	(hFFFI	=)					

<Ladder>

X00000	1	U CTUD	C000
X00001	 	D	
X00002		R <s></s>	5

1. If the count-up pulse is applied to the input rung when the reset signal is OFF, the word value of S device is increased one by one. Likewise, if the countdown 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>

5.5.4 Counter Instruction (CTR)



<Ladder>

X00000				
\dashv \vdash	1		UCTR	C000
X00001			R <s></s>	5
	- +	·÷÷-		I

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.



5.5.5 Timer Instruction (TON)

in	Timer struction	TON S N	Applicable model LP-S044, LP-S070, LP-A070 LP-A104
OP	DATA type	Available device / Description / Range	
		T, UW	Ster Car Zer
S	WORD	Timer contact you want to use	
		0(h0000) to 65535(hFFFF)	
		X, Y, M , S, T, C, D, Z, F, UW, integer	
Ν	WORD	Setting value of timer	
		0(h0000) to 65535(hFFFF)	

<Ladder>

×00000	TON	T000	20
			END

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>



5.5.6 Timer Instruction (TOFF)



<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".



5.5.7 **Timer Instruction (TMR)**



<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".



5.5.8 Timer Instruction (TMON)



<Ladder>

X00000				TODO	
	1		TWON	1000	200
	1	1			
	1				END
	÷	+-		÷	

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". .



Timer Instruction (TRTG) 5.5.9

ins	Timer struction	TRTG S N	Applicable model LP-S044, LP-S070,
			LP-A070, LP-A104
OP	DATA type	Available device / Description / Range	
		T, UW	Stej Bor Car Zerr
S	WORD	Timer contact you want to use	
		0(h0000) to 65535(hFFFF)	5
		X, Y, M , S, T, C, D, Z, F, UW, integer	
Ν	WORD	Setting value of timer	
		0(h0000) to 65535(hFFFF)	
	•		

<Ladder>

X00000				
		TRTG	T000	200
	T			
				END
	÷÷-			[]

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>

5.5.10 Control Instruction (JMP)

Control instruction		IMP LABEL		Applicable model LP-S044, LP-S070,					
			LP-	A070), LP-	-A104	4		
OP	DATA type	Available device / Description / Range							
		LABEL name	Erro	Zer	Car	Bor	Ste		
LABEL	STRING	Label for the place to jump		0	Ϋ́	row	q		
		STRING	O				3		
	•	•							

<Ladder>

X00000	1			
			JMP	TEST
LABEL	TEST	1		

 Jump to the place where the LABEL is matched.
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.



5.5.11 Control Instruction (LABEL)

C ins	Control struction	LABEL	Label name	Арр	blicable model
				LP-	S044, LP-S070,
				LP-	A070, LP-A104
OP	DATA type	Available devic	e / Description / Range		
		LABEL name		Erro	Ster Bor Zer
Label	STRING	Label for the plac	ce to be jumped	or	p ry row
name		STRING			3

<Ladder>

X00000			IMP	теот
			OIMI	H
LABEL	TEST			1
-		÷÷-		

It is a destination for the JMP instruction.

5.5.12 Control Instruction (FCALL)

Control instruction		FCALL LABEL		Applicable model LP-S044, LP-S070,				
				LP-/	A070	, LP-	A104	4
OP	DATA type	Available device	e / Description / Range					
		LABEL name		Errc	Zer	Car	Bori	Stel
LABEL	STRING	Label for the funct	tion to call	or	0	Ŋ	row	0
		STRING		\bigcirc				3

<Ladder>

мооооо —			FCALL	F_MOV	M00000	D0000	D0001
							END
FUNC	F_MOV	V00000	V0001	V0002	1		
					MOV	V0001	V0002
				1			RET

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.

5.5.13 Control Instruction (FUNC)

C ins	Control struction	FUNC	LABEL	App LP-\$	licat S044	ole m I, LP	odel -S07	0,
				LP-/	A070), LP	-A10	4
OP	DATA type	Available device	e / Description / Range					
		LABEL name		Erro	Zer	Car	Bor	Ste
LABEL	STRING	Label for the start	ing position of the function	9r	0	Ŋ	row	
		STRING						3
		STRING						

<Ladder>

мооооо Н			FCALL	F_MOV	M00000	D0000	D0001
			 				END
FUNC	F_MOV	V00000	V0001	V0002	1	1 1 1 1	1 1 1 7
	 		 	1 1 1 1	MOV	V0001	V0002
							RET

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.

5.5.14 Branch Instruction (CALL)

Branch instruction		CALL LABEL		Applicable model					
				LP-	5044	, LP-	·S070	0, 4	
	DATA turno		/ Description / Panga	LP-	4070	, LP-	·A104	4	
UP	DATA type	Available device	/ Description / Range						
		LABEL name		≣rrc	Zero	Cari	Borr	Step	
LABEL	STRING	Label for the funct	ion to call	٦r	0	Ş	WO.		
		STRING						3	

<Ladder>

X00000		CALL	TEST
			END
SUBRT	TEST .		
			RET

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 behind the END instruction.



5.5.15 Branch Instruction (SUBRT)

E ins	Branch struction	SUBRT	LABEL	App LP-\$	blicable model S044, LP-S070	١,
				LP-/	A070, LP-A104	
OP	DATA type	Available device	e / Description / Range			
		LABEL name		Erro	Bor Zer	Ste
LABEL	STRING	A label for the call	led function	Ŷ	o row	σ
		STRING				3

<Ladder>

×00000			CALL	TEST
	 	1 1 1 1		END
SUBRT	TEST .			
	 	 		RET

 Displays the starting point of the CALL subroutine.
It should be located behind END and cannot be used in duplicate.(For CALL statement, it is able to be used in duplicate)

5.5.16 Branch Instruction (RET)

Branch instruction RET

Applicable model LP-S044, LP-S070, LP-A070, LP-A104

Exits the subroutine

5.5.17 Loop Instruction (FOR)

ins	Loop struction	FOR	Ν	Арр	licab	ole mo	odel	
				LP-	S044	, LP-	·S07(D,
				LP-	A070), LP-	-A104	4
OP	DATA type	Available device	e / Description / Range					
		Integer		Erro	Zero	Car	Bori	Step
Ν	WORD			Ÿ		Ŋ	, MO,	0
		0(h0000) to 65535	5(hFFFF)					3

<Ladder>

	FOR	5
 		NEXT

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.



5.5.18 Loop Instruction (NEXT)

Loop instruction NEXT

Applicable model LP-S044, LP-S070, LP-A070, LP-A104

The program is repeated from the FOR instruction to the NEXT instruction.
5.5.19 Loop Instruction (BREAK)

Loop
instructionBREAKApplicable modelLP-S044, LP-S070,
LP-A070, LP-A104

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

P

5.5.20 Master control Instruction (MCS)

l c ins	Master control struction	MCS	Ν		Арр	licab	ole m	odel	
					LP-	S044	ŀ, LP∙	-S07(0,
					LP-/	A070), LP-	-A104	4
OP	DATA type	Available de	vice / Description / Range						
		Integer			Erro	Zero	Car	Bori	Step
Ν	Invariable	MCS number	(0 to 7)		Ÿ	0	Ż	, OM	
	number	0 to 7			\bigcirc				2
	I ins OP N	Master control instructionOPDATA typeNInvariable number	Master control instructionMCSOPDATA typeAvailable de Invariable numberNInvariable numberInteger MCS number 0 to 7	Master control instructionMCSNOPDATA typeAvailable device / Description / RangeNInvariable numberIntegerNInvariable numberMCS number (0 to 7) 0 to 7	Master control instructionMCSNOPDATA typeAvailable device / Description / RangeNInvariable numberIntegerNInvariable numberMCS number (0 to 7) 0 to 7	Master control instruction MCS N App Inversible number Available device / Description / Range LP-3 N DATA type Available device / Description / Range Image N Invariable number Integer Image N MCS number (0 to 7) Image Image 0 to 7 Image Image Image	Master control instruction MCS N Applicability LP-S044 LP-A070 OP DATA type Available device / Description / Range Image: Control instruction N Invariable number Integer Image: Control instruction N Invariable number MCS number (0 to 7) Image: Control instruction 0 to 7 Image: Control instruction Image: Control instruction	Master control instruction MCS N Applicable methods Inversible number LP-S044, LP-LP-A070, LP-LP-A070, LP-LP-A070, LP-LP-A070, LP-LP-A070, LP-LP-A070, LP-LP-A070, LP-LP-LP-LP-LP-LP-LP-LP-LP-LP-LP-LP-LP-L	Master control instruction MCS N Applicable model LP-S044, LP-S074 LP-S044, LP-S074 LP-A070, LP-A104 OP DATA type Available device / Description / Range Image: Control instruction Image: Control instructin Image: Control instruction

<Ladder>

×00000		MCS	
· · · · · · · · · · · · · · · · · · ·	· · · · · · · · · · · · · · · · · · ·	1	
		MCR	0

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.



5.5.21 Master control Instruction (MCR)

N c ins	Master ontrol truction	MCR	Ν	App LP- LP-	olicable m ∙S044, LP• ∙A070, LP•	odel -S070, -A104	
OP	DATA type	Available device	e / Description / Range				
		Integer		Errc	Carı Zeru	Step	2
Ν	Invariable	MCR number (0 t	o 7)	Ÿ		NON D	
	number	0 to 7				2	

<Ladder>

X00000						
- F	1	1	1	MCS	0	귀
	1	1	1	MCR	0	귀
						-1

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

5.5.22 Interrupt Instruction (EI)

Applicable model
LP-S044, LP-S070,
LP-A070, LP-A104
Ster Zerr Errc
-

<Ladder>

P

M00000		
- F		El
M00001		
	· · · · · · · · · · · · · · · · · · ·	DI

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.

5.5.23 Interrupt Instruction (DI)

lr in:	nterrupt struction	DI	Арј	plicabl	le m	odel	
			LP	-S044	, LP-	-S07	0,
			LP	-A070	, LP-	-A10	4
OP	DATA type	Available device / Description / Range					
			Error	Zero	Carry	Borrow	Step
							1

<Ladder>

мооооо	1	I I	
— <u> </u>	 		El
M00001			
	 	 	DI

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.

5.5.24 Interrupt Instruction (ETI)

lr in:	nterrupt struction	ETI	Арр	licab	ole m	odel	
			LP-	S044	ł, LP-	-S07(0,
			LP-	A070), LP-	-A104	4
OP	DATA type	Available device / Description / Range					
		Integer	Erro	Zero	Carı	Borr	Step
	Invariable		٦	0	2	MO.	
	number	0 to 7					1
	•						

<Ladder>

M00000		1		- I
		(ETI	0
M00001	1			
	1		DTI	0

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)

5.5.25 Interrupt Instruction (EEI)

	Interrupt instruction	EEI	Applicable model
			LP-S044, LP-S070,
			LP-A070, LP-A104
0	P DATA typ	e Available device / Description / Range	
		Integer	Errc Zerc
	Invariable		
	number	0 to 15	
	1		

<Ladder>

молол		i		
	1	<u> </u>	EEI	0
M00001				
			DEI	0
				1

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

EEI External Interrupt Number(0 to 15)

5.5.26 Interrupt Instruction (DTI)

lr in:	nterrupt struction	DTI	Арр	licab	le m	odel	
			LP-	S044	, LP-	-S070	D,
			LP-	A070), LP-	-A104	1
OP	DATA type	Available device / Description / Range					
		Integer	Errc	Zero	Carı	Borr	Step
	Invariable		Ť		2	WO	
	number	0 to 7					1

<Ladder>

M00000	I	1		
			ETI	0
M00001				
			DTI	0

Disable Time Interrupt

- 1. Disables the individual time interrupt.
- 2. Structure of the instructions
- DTI Time Interrupt Number(0 to 7)

5.5.27 Interrupt Instruction (DEI)

	In ins	terrupt struction	DEI	Арр	licable r	nodel	
				LP-	S044, LI	P-S070	D,
				LP-	A070, LI	P-A104	4
C)P	DATA type	Available device / Description / Range				
			Integer	Erro	Cari	Borr	Step
		Invariable		Ť		WO.	
		number	0 to 15				1

<Ladder>

M00000			I
		EEI	0
M00001		-	
	· · · · · · · · · · · · · · · · · · ·	DEI	0
1	: :		I

Disable External Interrupt

1. Disables the individual external interrupt.

2. Structure of the instructions

DEI External Interrupt Number(0 to 15)

5.5.28 Interrupt Instruction (TINT)

lı in	nterrupt struction	TINT	Арр	olicable model
			LP-:	S044, LP-S070,
			LP-	A070, LP-A104
OP	DATA type	Available device / Description / Range		
	la sa da bila	Integer	Erro	Step Borr Carr
	Invariable		, i	
	number	0 to 7		
	1			

<Ladder>

				-
1		TINT	0	ł
	+	+-		
			-	

Time Interrupt

1. Represents 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

TINT Time Interrupt Number(0 to 7)



5.5.29 Interrupt Instruction (EINT)

nterrupt struction	EINT	App	olicab	le mo	odel	
		LP-	S044	, LP-	S070),
		LP-	A070	, LP-	A104	ļ
DATA type	Available device / Description / Range					
	Integer	Errc	Zero	Carı	Borr	Step
Invariable		r		7	WO	
number	0 to 15					1
	DATA type Invariable number	Deterrupt struction EINT DATA type Available device / Description / Range Invariable number Integer 0 to 15 0 to 15	terrupt struction EINT Approximation LP- LP- LP- DATA type Available device / Description / Range Invariable number Integer 0 to 15 0 to 15	terrupt struction EINT Applicab LP-S044 LP-A070 DATA type Available device / Description / Range Integer Invariable 	terrupt struction EINT Applicable model LP-S044, LP- LP-A070, LP- DATA type Available device / Description / Range Image: Im	terrupt struction EINT Applicable model LP-S044, LP-S070 LP-A070, LP-A104 DATA type Available device / Description / Range Image: I

<Ladder>

	1	1	I
 		EINT	0
 			- L I

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

EINT External Interrupt Number(0 to 15)

5.5.30 Interrupt Instruction (IRET)

Applicable model
LP-S044, LP-S070,
LP-A070, LP-A104
Erro Zerr
LP-A070, LP-A10

<Ladder>

		1	1
		EINT	3
 	1		
 · +	· · · · · · · · · · · · · · · · · · ·		₽

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

5.5.31 Watchdog timer(WDT)

V	Vatchdog timer	WDT	Applicable model	
			LP-S044, LP-S07	'0,
			LP-A070, LP-A10)4
OP	DATA type	Available device / Description / Ran	ge	
			Errc Zerr	Step
				1

<Ladder>

×00000		

1. Resets watch dog timer during the program operation.

 When the operation time from 0 step to END is over than max. watchdog setting time, program operation stops and WDT instruction should be used.
Watch dog setting value is able to change by

special device.4. When resupply power, watchdog setting value is

When resupply power, watchdog setting value is reset as 200ms.

5.5.32 Input comparison Instruction (LOAD=)

cor ins	Input nparison struction	LOAD= S1 S2	Applicable model LP-S044, LP-S070, LP-A070, LP-A104
OP	DATA type	Available device / Description / Range	
		X, Y, F, Z, T, C, M, S, L, D, UW, integer	Step Born Carr
S1	INT	Data or address to compare with S2	
		-32768(h8000) to 32767(h7FFF)	5
		X, Y, F, Z, T, C, M, S, L, D, UW, integer	
S2	INT	Data or address to compare with S1	
		-32768(h8000) to 32767(h7FFF)	

<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))

-)		Comparison result	
EX)	LOAD= H0001 H3456		OFF
		Comparison result	
	LOAD= H0001 H0001		ON

5.5.33 Input comparison Instruction (LOAD>)

coi ins	Input mparison struction	LOAD> S1 S2	Applicable model LP-S044, LP-S070, LP-A070, LP-A104
OP	DATA type	Available device / Description / Range	
		X, Y, F, Z, T, C, M, S, L, D, UW, integer	Step Carr Zerc
S1	INT	Data or address to compare with S2	
		-32768(h8000) to 32767(h7FFF)	5
		X, Y, F, Z, T, C, M, S, L, D, UW, integer	
S2	INT	Data or address to compare with S1	
		-32768(h8000) to 32767(h7FFF)	
_			

<Ladder>

」 →	M0001	M0000	Y00000

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 hFFF(-1) < 0 to h7FFF(32767))

Ex)		Comparison result	_
LX,	LOAD> H0001 H3456	OFF	
		Comparison result	
	LOAD> H0F5D H0001		

5.5.34 Input comparison Instruction (LOAD<)

cor ins	Input nparison struction	LOAD< S1 S2	Applicable model LP-S044, LP-S070, LP-A070, LP-A104
OP	DATA type	Available device / Description / Range	
		X, Y, F, Z, T, C, M, S, L, D, UW, integer	Step Borr Carr Zerc
S1	INT	Data or address to compare with S2	
		-32768(h8000) to 32767(h7FFF)	5
		X, Y, F, Z, T, C, M, S, L, D, UW, integer	
S2	INT	Data or address to compare with S1	
		-32768(h8000) to 32767(h7FFF)	

<Ladder>

- ≺	X0000	M0000	Y00000
			END .

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 comparison.

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

Ex)	LOAD< H0001 H3456	Comparison result	ON
		Composioon socult	
	LOAD< H0F5D H0001		OFF

5.5.35 Input comparison Instruction (LOAD<>)

cor ins	Input nparison struction	LOAD<> S1 S2	Applicable model LP-S044, LP-S070, LP-A070, LP-A104
OP	DATA type	Available device / Description / Range	
		X, Y, F, Z, T, C, M, S, L, D, UW, integer	Ster Borr Carr
S1	INT	Data or address to compare with S2	
		-32768(h8000) to 32767(h7FFF)	5
		X, Y, F, Z, T, C, M, S, L, D, UW, integer	
S2	INT	Data or address to compare with S1	
		-32768(h8000) to 32767(h7FFF)	

<Ladder>

 X0000	M0000 .	Y00000
		END

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 $\ensuremath{\mathsf{OFF}}$.

3. Executes the Signed comparison.

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

Ex)	LOAD<> H0001 H3456	Comparison result	ON	
	LOAD<> H0002 H0002	Comparison result	OFF	
		J ⁻ I		

5.5.36 Input comparison Instruction (LOAD>=)

co in:	Input mparison struction	LOAD>= S1 S2	Applicable model LP-S044, LP-S070, LP-A070, LP-A104
OP	DATA type	Available device / Description / Range	
		X, Y, F, Z, T, C, M, S, L, D, UW, integer	Step Borr Zero
S1	INT	Data or address to compare with S2	
		-32768(h8000) to 32767(h7FFF)	5
		X, Y, F, Z, T, C, M, S, L, D, UW, integer	
S2	INT	Data or address to compare with S1	
		-32768(h8000) to 32767(h7FFF)	

<Ladder>

>=	X0000	моооо	Y00000
			END

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 comparison.

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

Ex)	LOAD>= H0001 H3456	Comparison result	OFF	
	LOAD>= H0F5D H0001	Comparison result	ON	

5.5.37 Input comparison Instruction (LOAD<=)

cor ins	Input nparison struction	LOAD<= S1 S2	Applicable model LP-S044, LP-S070, LP-A070, LP-A104
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)	Step ທ Borrow Carry Carry Zero
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)	

<Ladder>

_ <=	D0000	D0002	Y00003
			END

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 comparison.

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

	H0001 H3456	Comparison result	ON	
LOAD<	HFF00 H3456	Comparison result	OFF	

5.5.38 Input comparison Instruction (DLOAD=)

cor ins	Input nparison struction	DLOAD= S1 S2	Applicable model LP-S044, LP-S070, LP-A070, LP-A104
OP	DATA type	Available device / Description / Range	
		X, Y, F, Z, T, C, M, S, L, D, UW, integer	Step Borr Zero
S1	DINT	Data or address to compare with S2	
		-2147483648(h80000000) to 2147483647(hFFFFFFF)	5
		X, Y, F, Z, T, C, M, S, L, D, UW, integer	
S2	DINT	Data or address to compare with S1	
		-2147483648(h80000000) to 2147483647(hFFFFFFF)	

<Ladder>

_ =	D0000	D0002	Y00000
-	m = = = = = = = = = = = = = = = = = = =		END
	1		

1. If the double word values of S1 and S2 are equal, it turns ON.

If the double word values of S1 and S2 are not equal, it turns OFF.
Executes the Signed comparison.

(h8000000(-2147483648) to hFFFFFFF(-1) < 0 to h7FFFFFF(2147483647))

				_	
Ex)	DLOAD=	H000100FF	H34561000	Comparison result	OFF
	DLOAD=	H00014000	H00014000	Comparison result	ON

5.5.39 Input comparison Instruction (DLOAD>)

cor ins	Input nparison struction	DLOAD> S1 S2	Apr LP- LP-	blicable model S044, LP-S070, A070, LP-A104
OP	DATA type	Available device / Description / Range		
		X, Y, F, Z, T, C, M, S, L, D, UW, integer	Erro	Ster Car
S1	DINT	Data or address to compare with S2	or	
		-2147483648(h80000000) to 2147483647(hFFFFFFF)		5
		X, Y, F, Z, T, C, M, S, L, D, UW, integer		
S2	DINT	Data or address to compare with S1		
		-2147483648(h80000000) to 2147483647(hFFFFFFF)		

<Ladder>

_ >	D0000	D0002		Y00000
-				
			÷÷-	

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 comparison.

(h8000000(-2147483648) to hFFFFFFF(-1) <

0 to h7FFFFFF(2147483647))

Ex)				Comparison result	
EX)	DLOAD>	H0001FFFF	H3456FFFF	\longrightarrow	OFF
				Comparison result	
	DLOAD>	H0F5D0F0F	H00010F0F	\longrightarrow	ON

5.5.40 Input comparison Instruction (DLOAD<)

cor ins	Input nparison struction	DLOAD< S1 S2	Applicable model LP-S044, LP-S070, LP-A070, LP-A104
OP	DATA type	Available device / Description / Range	
		X, Y, F, Z, T, C, M, S, L, D, UW, integer	Step Borr Zero
S1	DINT	Data or address to compare with S2	
		-2147483648(h80000000) to 2147483647(hFFFFFFF)	5
		X, Y, F, Z, T, C, M, S, L, D, UW, integer	
S2	DINT	Data or address to compare with S1	
		-2147483648(h80000000) to 2147483647(hFFFFFFF)	

<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 $% \left({{{\mathbf{S}}_{\mathbf{1}}}_{\mathbf{2}}} \right)$

S2, it turns OFF.

3. Executes the Signed comparison.

(h80000000(-2147483648) to hFFFFFFF(-1) < 0 to h7FFFFFF(2147483647))

Ex) DLOAD	K H00013422	H3456DA12	Comparison result	ON	
			Comparison requit		
DLOAD	K H0F5D3321	H00010010	Comparison result	OFF	

5.5.41 Input comparison Instruction (DLOAD<>)

cor ins	Input nparison struction	DLOAD<> S1 S2	App LP- LP-	blicable model S044, LP-S070, A070, LP-A104
OP	DATA type	Available device / Description / Range		
		X, Y, F, Z, T, C, M, S, L, D, UW, integer	Erro	Ster Born Car
S1	DINT	Data or address to compare with S2)r	
		-2147483648(h80000000) to 2147483647(hFFFFFFF)		5
		X, Y, F, Z, T, C, M, S, L, D, UW, integer		
S2	DINT	Data or address to compare with S1		
		-2147483648(h80000000) to 2147483647(hFFFFFFF)		
		·		

<Ladder>

_	D0000	D0002	Y00000
-			 END
		1	

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 comparison.

(h8000000(-2147483648) to hFFFFFFF(-1) < 0 to h7FFFFFF(2147483647))

_ \				Commoniaan nooult	
Ex)	DLOAD<>	H0001239	H34562342	Comparison result	ON
	DLOAD<>	H0002DCD1	H0002DCD1	Comparison result	OFF
				_	

5.5.42 Input comparison Instruction (DLOAD>=)

cor ins	Input nparison struction	DLOAD>= S1 S2	Applicable model LP-S044, LP-S070, LP-A070, LP-A104
OP	DATA type	Available device / Description / Range	
		X, Y, F, Z, T, C, M, S, L, D, UW, integer	Step Born Carr
S1	DINT	Data or address to compare with S2	
		-2147483648(h80000000) to 2147483647(hFFFFFFF)	5
		integer, *, Z, X, Y, M, D, L, F, T, C, UW	
S2	DINT	Data or address to compare with S1	
		-2147483648(h80000000) to 2147483647(hFFFFFFF)	

<Ladder>

_ >=	D0000	D0002	Y00000
			END

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 comparison.

(h8000000(-2147483648) to hFFFFFFF(-1) < 0 to h7FFFFFF(2147483647))

Ex)	DLOAD>=	H00010000	H345632DD	Comparison result	OFF	
	DLOAD>=	H0F5DD123	H00010000	Comparison result	ON	

5.5.43 Input comparison Instruction (DLOAD<=)

cor ins	Input nparison struction	DLOAD<= S1 S2	App LP- LP-	blicable model S044, LP-S070, A070, LP-A104
OP	DATA type	Available device / Description / Range		
		X, Y, F, Z, T, C, M, S, L, D, UW, integer	Erro	Ster Car
S1	DINT	Data or address to compare with S2	yr	
		-2147483648(h80000000) to 2147483647(hFFFFFFF)		5
		X, Y, F, Z, T, C, M, S, L, D, UW, integer		
S2	DINT	Data or address to compare with S1		
		-2147483648(h80000000) to 2147483647(hFFFFFFF)		

<Ladder>

<=	D0000	D0002	1 1 1 1 1 1 1 1 1 1	Y00003
				END

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 comparison.

(h80000000(-2147483648) to hFFFFFFF(-1) < 0 to h7FFFFFF(2147483647))

Ex)	DLOAD<=	H00010000	H34560000	Comparison result	ON	
	DLOAD<=	HFF00AD12	H3456D567	Comparison result	OFF	

5.5.44 Input comparison Instruction (AND=)

cor ins	Input nparison struction	AND= S1 S2	Applicable model LP-S044, LP-S070, LP-A070, LP-A104
OP	DATA type	Available device / Description / Range	
		X, Y, F, Z, T, C, M, S, L, D, UW, integer	Step Born Zero
S1	INT	Data or address to compare with S2	
		-32768(h8000) to 32767(h7FFF)	5
		X, Y, F, Z, T, C, M, S, L, D, UW, integer	
S2	INT	Data or address to compare with S1	
		-32768(h8000) to 32767(h7FFF)	

<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 comparison.

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

Instruction	Condition	Comparison result
AND =	S1 = S2	ON

5.5.45 Input comparison Instruction (AND>)



<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 comparison.

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

Instruction	Condition	Comparison result
AND >	$S1 \rightarrow S2$	ON

5.5.46 Input comparison Instruction (AND<)

cor ins	Input nparison struction	AND< S1 S2	Applicable model LP-S044, LP-S070, LP-A070, LP-A104
OP	DATA type	Available device / Description / Range	
		X, Y, F, Z, T, C, M, S, L, D, UW, integer	Step Carr Zero
S1	INT	Data or address to compare with S2	
		-32768(h8000) to 32767(h7FFF)	5
		X, Y, F, Z, T, C, M, S, L, D, UW, integer	
S2	INT	Data or address to compare with S1	
		-32768(h8000) to 32767(h7FFF)	

<Ladder>

X00000	D0000	D0002	Y00000
			END

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 comparison.

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

Instruction	Condition	Comparison result
AND <	S1 < S2	ON

5.5.47 Input comparison Instruction (AND<>)



<Ladder>

×00000 	D0000	D0002	Y00000
	1		END
·			

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 comparison.

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

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

5.5.48 Input comparison Instruction (AND>=)

coi ins	Input mparison struction	AND>= S1 S2	Apr LP- LP-	olicab S044 A070	le m ⊧, LP-), LP-	odel -S070, -A104
OP	DATA type	Available device / Description / Range				
		X, Y, F, Z, T, C, M, S, L, D, UW, integer	Erro	Zer	Car	Ste
S1	INT	Data or address to compare with S2	or	0	Ŋ	TOW D
		-32768(h8000) to 32767(h7FFF)				5
		X, Y, F, Z, T, C, M, S, L, D, UW, integer				
S2	INT	Data or address to compare with S1				
		-32768(h8000) to 32767(h7FFF)				
			•			

<Ladder>

×00000 	D0000	D0002	Y00000
	 		END

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 comparison.

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

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

5.5.49 Input comparison Instruction (AND<=)



<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 comparison.

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

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

5.5.50 Input comparison Instruction (DAND=)

coi ins	Input mparison struction	DAND= S1 S2	App LP-	olicat S044 A070	le m ⊧, LP-), LP-	odel -S070, -A104
OP	DATA type	Available device / Description / Range				
		X, Y, F, Z, T, C, M, S, L, D, UW, integer	Erro	Zer	Car	Ste
S1	DINT	Data or address to compare with S2	or	0	Ŋ	row
		-2147483648(h80000000) to 2147483647(h7FFFFFFF)				5
		X, Y, F, Z, T, C, M, S, L, D, UW, integer				
S2	DINT	Data or address to compare with S1				
		-2147483648(h80000000) to 2147483647(h7FFFFFFF)				

<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 comparison.

(h80000000(-2147483648) to hFFFFFFF(-1) < 0 to h7FFFFFF(2147483647))

Instruction	Condition	Comparison result
DAND =	S1 = S2	ON

5.5.51 Input comparison Instruction (DAND>)

cor ins	Input nparison struction	DAND> S1 S2	Applicable model LP-S044, LP-S070, LP-A070, LP-A104
OP	DATA type	Available device / Description / Range	
		X, Y, F, Z, T, C, M, S, L, D, UW, integer	Ster Errc
S1	DINT	Data or address to compare with S2	
		-2147483648(h80000000) to 2147483647(hFFFFFFF)	5
		X, Y, F, Z, T, C, M, S, L, D, UW, integer	
S2	DINT	Data or address to compare with S1	
		-2147483648(h80000000) to 2147483647(hFFFFFFF)	
-	·		-

<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 comparison.

(h8000000(-2147483648) to hFFFFFFF(-1) <

0 to h7FFFFFF(2147483647))

Instruction	Condition	Comparison result
DAND >	S1 > S2	ON

5.5.52 Input comparison Instruction (DAND<)

cor ins	Input nparison struction	DAND< S1 S2	Applicable model LP-S044, LP-S070, LP-A070, LP-A104
OP	DATA type	Available device / Description / Range	
	DINT	X, Y, F, Z, T, C, M, S, L, D, UW, integer	Ster Bor Car Zer
S1		Data or address to compare with S2	
		-2147483648(h80000000) to 2147483647(hFFFFFFF)	5
		X, Y, F, Z, T, C, M, S, L, D, UW, integer	
S2	DINT	Data or address to compare with S1	
		-2147483648(h80000000) to 2147483647(hFFFFFFF)	

<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 comparison.

(h8000000(-2147483648) to hFFFFFFF(-1) <

0 to h7FFFFFF(2147483647))

Instruction	Condition	Comparison result
DAND <	S1 < S2	ON

5.5.53 Input comparison Instruction (DAND<>)

cor ins	Input nparison struction	DAND<> S1 S2	Apr LP- LP-	olicab S044 A070	ole m ⊦, LP-), LP-	odel -S070, -A104	
OP	DATA type	Available device / Description / Range					
		X, Y, F, Z, T, C, M, S, L, D, UW, integer	Erro	Zer	Car	Stej Bori	
S1	DINT	Data or address to compare with S2	or	0	Ş	NON O	
		-2147483648(h80000000) to 2147483647(hFFFFFFF)				5	
		X, Y, F, Z, T, C, M, S, L, D, UW, integer				,	_
S2	DINT	Data or address to compare with S1					
		-2147483648(h80000000) to 2147483647(hFFFFFFF)					

<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 comparison. (h8000000(-2147483648) to hFFFFFFF(-1) < 0 to h7FFFFFF(2147483647))

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

5.5.54 Input comparison Instruction (DAND>=)

cor ins	Input nparison struction	DAND>= S1 S2	Applicable model LP-S044, LP-S070, LP-A070, LP-A104
OP	DATA type	Available device / Description / Range	
		X, Y, F, Z, T, C, M, S, L, D, UW, integer	Step Born Zero
S1	DINT	Data or address to compare with S2	
		-2147483648(h80000000) to 2147483647(hFFFFFFF)	5
		X, Y, F, Z, T, C, M, S, L, D, UW, integer	
S2	DINT	Data or address to compare with S1	
		-2147483648(h80000000) to 2147483647(hFFFFFFF)	
			-

<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 comparison.

(h8000000(-2147483648) to hFFFFFFF(-1) < 0 to h7FFFFFF(2147483647))

Instruction	Condition	Comparison result
DAND > =	S1 > = S2	ON
5.5.55 Input comparison Instruction (DAND<=)

cor ins	Input mparison struction	DAND<= S1 S2	Applicable model LP-S044, LP-S070, LP-A070, LP-A104
OP	DATA type	Available device / Description / Range	
		X, Y, F, Z, T, C, M, S, L, D, UW, integer	Ster Born Carr
S1	DINT	Data or address to compare with S2	
		-2147483648(h80000000) to 2147483647(hFFFFFFF)	5
	DINT	X, Y, F, Z, T, C, M, S, L, D, UW, integer	
S2		Data or address to compare with S1	
		-2147483648(h80000000) to 2147483647(hFFFFFFF)	
	•		

<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 $% \left({{{\mathbf{S}}_{\mathbf{1}}}_{\mathbf{2}}} \right)$

S2, it turns OFF.

3. Executes the Signed comparison.

(h80000000(-2147483648) to hFFFFFFF(-1) < 0 to h7FFFFFF(2147483647))

Instruction	Condition	Comparison
DAND <=	S1 < = S2	ON

5.5.56 Input comparison Instruction (OR=)



<Ladder>

X00000			Y00000
=	D0000	D0002	

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 comparison.

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

Instruction Condition Comparison
OR = S1 = S2 ON

5.5.57 Input comparison Instruction (OR>)



<Ladder>

X00000			Y00000
_ >	D0000	D0002	
	+		 ┥╘┉┙┦

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 comparison.

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

Instruction	Condition	Comparison
OR >	S1 > S2	ON

5.5.58 Input comparison Instruction (OR<)



<Ladder>

X00000				Y00000
<	D0000	D0002	- - - - - - - - - - - - - - - - - - -	
				END

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 comparison.

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

InstructionConditionComparisonOR S1 < S2ON			
OR < S1 < S2 ON	Instruction	Condition	Comparison
	OR <	S1 < S2	ON

5.5.59 Input comparison Instruction (OR<>)

coi ins	Input mparison struction	OR<> S1 S2	Applicable model LP-S044, LP-S070, LP-A070, LP-A104
OP	DATA type	Available device / Description / Range	
		X, Y, F, Z, T, C, M, S, L, D, UW, integer	Step Carr Zero
S1	INT	Data or address to compare with S2	
		-32768(h8000) to 32767(h7FFF)	5
	INT	X, Y, F, Z, T, C, M, S, L, D, UW, integer	
S2		Data or address to compare with S1	
		-32768(h8000) to 32767(h7FFF)	

<Ladder>

X00000				Y00000
	D0000	D0002		
			r	END

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 comparison.

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

Instruction	Condition	Comparison
OR <>	S1 <> S2	ON

5.5.60 Input comparison Instruction (OR>=)



<Ladder>

X00000			Y00000
_ >=	D0000	D0002	
			END

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 comparison.

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

Instruction	Condition	Comparison
OR > =	S1 > = S2	ON

5.5.61 Input comparison Instruction (OR<=)

coi ins	Input mparison struction	OR<= S1 S2	Applicable model LP-S044, LP-S070, LP-A070, LP-A104
OP	DATA type	Available device / Description / Range	
		X, Y, F, Z, T, C, M, S, L, D, UW, integer	Step Carr Zero
S1	INT	Data or address to compare with S2	
		-32768(h8000) to 32767(h7FFF)	5
S2	INT	Data or address to compare with S1	
		-32768(h8000) to 32767(h7FFF)	

<Ladder>

X00000			Y00000
	D0000	D0002	
			END

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 comparison.

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

Instruction	Condition	Comparison
OR < =	S1 < = S2	ON

5.5.62 Input comparison Instruction (DOR=)

cor ins	Input nparison struction	DOR= S1 S2	Applicable model LP-S044, LP-S070, LP-A070, LP-A104
OP	DATA type	Available device / Description / Range	
		X, Y, F, Z, T, C, M, S, L, D, UW, integer	Ster Bor Car Zer
S1	DINT	Data or address to compare with S2	
		-2147483648(h80000000) to 2147483647(h7FFFFFFF)	5
		X, Y, F, Z, T, C, M, S, L, D, UW, integer	
S2	DINT	Data or address to compare with S1	
		-2147483648(h80000000) to 2147483647(h7FFFFFFF)	

<Ladder>

X00000			Y00000
	D0000	D0002	
			END

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 comparison.

(h8000000(-2147483648) to hFFFFFFF(-1) < 0 to h7FFFFFF(2147483647))

In	struction	Condition	Comparison
D	OR =	S1 = S2	ON

5.5.63 Input comparison Instruction (DOR>)

cor ins	Input nparison struction	DOR> S1 S2	Applicable model LP-S044, LP-S070, LP-A070, LP-A104				
OP	DATA type	Available device / Description / Range					
		X, Y, F, Z, T, C, M, S, L, D, UW, integer	Errc Carr				
S1	DINT	Data or address to compare with S2					
		-2147483648(h80000000) to 2147483647(h7FFFFFFF)	5				
		X, Y, F, Z, T, C, M, S, L, D, UW, integer					
S2	DINT	Data or address to compare with S1					
		-2147483648(h80000000) to 2147483647(h7FFFFFFFF)					
			—				

<Ladder>

X00000			Y00000
1t >	D0000	D0002	
•			

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 comparison.

(h80000000(-2147483648) to hFFFFFFF(-1) < 0 to h7FFFFFF(2147483647))

Instruction	Condition	Comparison
DOR >	S1 > S2	ON

5.5.64 Input comparison Instruction (DOR<)

cor ins	Input nparison struction	DOR< S1 S2	Applicable model LP-S044, LP-S070, LP-A070, LP-A104
OP	DATA type	Available device / Description / Range	
		X, Y, F, Z, T, C, M, S, L, D, UW, integer	Stel Born Zern
S1	DINT	Data or address to compare with S2	
		-2147483648(h80000000) to 2147483647(h7FFFFFFF)	5
S2	DINT	Data or address to compare with S1	
		-2147483648(h80000000) to 2147483647(h7FFFFFFFF)	

<Ladder>

X00000			Y00000
II _	D0000	D0002	
			END

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 comparison.

(h8000000(-2147483648) to hFFFFFF(-1) <

0 to h7FFFFFF(2147483647))

Instruction	n Condition	Comparison
DOR <	S1 < S2	ON

5.5.65 Input comparison Instruction (DOR<>)

cor ins	Input nparison struction	DOR<> S1 S2	Applicable model LP-S044, LP-S070, LP-A070, LP-A104
OP	DATA type	Available device / Description / Range	
		X, Y, F, Z, T, C, M, S, L, D, UW, integer	Stel Born Zern
S1	DINT	Data or address to compare with S2	
		-2147483648(h80000000) to 2147483647(h7FFFFFFF)	5
		X, Y, F, Z, T, C, M, S, L, D, UW, integer	
S2	DINT	Data or address to compare with S1	
		-2147483648(h80000000) to 2147483647(h7FFFFFFF)	
-	•		

<Ladder>

X00000				Y00000
	D0000	D0002 L		
-1		Г Г		END
	+		÷	<u> </u>

1. If the double word value of S1 is not equal to that of S2, it turns ON.

If the double word value of S1 is equal to that of S2, it turns OFF.
Executes the Signed comparison

3. Executes the Signed comparison. (h80000000(-2147483648) to hFFFFFFF(-1) <

0 to h7FFFFFF(2147483647))

Instruction	Condition	Comparison
DOR <>	S1 <> S2	ON

5.5.66 Input comparison Instruction (DOR>=)

cor ins	Input nparison struction	DOR>= S1 S2	Applicable model LP-S044, LP-S070, LP-A070, LP-A104
OP	DATA type	Available device / Description / Range	
		X, Y, F, Z, T, C, M, S, L, D, UW, integer	Ster Borr Zerr
S1	DINT	Data or address to compare with S2	
		-2147483648(h80000000) to 2147483647(h7FFFFFF)	5
		X, Y, F, Z, T, C, M, S, L, D, UW, integer	
S2	DINT	Data or address to compare with S1	
		-2147483648(h80000000) to 2147483647(h7FFFFFF)	
	•	•	

<Ladder>

X00000				Y00000
_ >=	D0000	D0002	1	
				END

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 comparison.

(h80000000(-2147483648) to hFFFFFFF(-1) < 0 to h7FFFFFF(2147483647))

Instruction	Condition	Comparison
DOR > = S	1 > = S2	ON

5.5.67 Input comparison Instruction (DOR<=)

coi ins	Input mparison struction	DOR<= S1 S2	Applicable model LP-S044, LP-S070, LP-A070, LP-A104
OP	DATA type	Available device / Description / Range	
		X, Y, F, Z, T, C, M, S, L, D, UW, integer	Stel Borr Zerr
S1	DINT	Data or address to compare with S2	
		-2147483648(h80000000) to 2147483647(h7FFFFFF)	5
		X, Y, F, Z, T, C, M, S, L, D, UW, integer	
S2	DINT	Data or address to compare with S1	
		-2147483648(h80000000) to 2147483647(h7FFFFFF)	

<Ladder>

X00000				Y00000
<=	D0000	D0002		
			•	END

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 $% \left({{{\mathbf{S}}_{\mathbf{1}}}_{\mathbf{2}}} \right)$

S2, it turns OFF.

3. Executes the Signed comparison.

(h80000000(-2147483648) to hFFFFFFF(-1) < 0 to h7FFFFFF(2147483647))

Instruction	Condition	Comparison
DOR < =	S1 < = S2	ON

5.5.68 Comparison Instruction (CMP)



<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. Comparison executes the Signed operation.

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



5.5.69 Comparison Instruction (DCMP)

Co in:	mparison struction	DCMP S1 S2 D	App LP-	olicable S044, A070,	e mod LP-S LP-A	el 070, 104
OP	DATA type	Available device / Description / Range				
		X, Y, F, Z, T, C, M, S, L, D, UW, integer	Erro	Zero	Car	Step
S1	DINT	Data or address to compare with S2	r	0	< <	
	-2147483648(h80000000) to 2147483647(h7FFFFFF)					7
		X, Y, F, Z, T, C, M, S, L, D, UW, integer				
S2	S2 DINT Data or address to compare with S1					
	-2147483648(h80000000) to 2147483647(h7FFFFFF)					
		Y, M, UB				
D	BIT	Lead address of bit device to save the comparison result				
		Not applicable				

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



5.5.70 Comparison Instruction (ACMP)

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 Image: Compare with S2 Not applicable 7 S2 BIT Lead address of data or bit device to compare with S1 Not applicable 7 S4 Y, M, UB Lead address of bit device to save the comparison result Not applicable X, Y, F, Z, T, C, M, S, L, D, UW, integer N WORD The number of devices to compare	Cor ins	mparison struction	ACMP S1 S2 D N	Applicable model LP-S044, LP-S070,
S1 Not applicable S2 BIT X, Y, F, T, C, M, UB Lead address of data or bit device to compare with S2 Not applicable X, Y, F, T, C, M, UB Lead address of data or bit device to compare with S1 Not applicable V, Y, F, T, C, M, UB Lead address of data or bit device to compare with S1 Not applicable V, M, UB Lead address of bit device to save the comparison result Not applicable X, Y, F, Z, T, C, M, S, L, D, UW, integer N WORD	OP	DATA type	Available device / Description / Range	LF-A070, LF-A104
S1 BIT Lead address of data or bit device to compare with S2 Q O Z Z <th></th> <th>51</th> <th>х, ү, ғ, т, с, м, uв</th> <th>Erro Car Bor</th>		51	х, ү, ғ, т, с, м, uв	Erro Car Bor
Not applicable 7 X, Y, F, T, C, M, UB Lead address of data or bit device to compare with S1 Not applicable Y, M, UB Lead address of bit device to save the comparison result Not applicable X, Y, F, Z, T, C, M, S, L, D, UW, integer N WORD X, Y, F, Z, T, C, M, S, L, D, UW, integer The number of devices to compare	S1	віт	Lead address of data or bit device to compare with S2	o row
S2 BIT X, Y, F, T, C, M, UB Lead address of data or bit device to compare with S1 Not applicable Y, M, UB Lead address of bit device to save the comparison result Not applicable X, Y, F, Z, T, C, M, S, L, D, UW, integer The number of devices to compare			Not applicable	
S2 BIT Lead address of data or bit device to compare with S1 Not applicable Not applicable D BIT Y, M, UB Lead address of bit device to save the comparison result Not applicable Not applicable Not applicable Not applicable The number of devices to compare			X, Y, F, T, C, M, UB	
Not applicable D BIT Y, M, UB Lead address of bit device to save the comparison result Not applicable X, Y, F, Z, T, C, M, S, L, D, UW, integer The number of devices to compare	S2	BIT	Lead address of data or bit device to compare with S1	
D BIT Y, M, UB Lead address of bit device to save the comparison result Not applicable X, Y, F, Z, T, C, M, S, L, D, UW, integer The number of devices to compare			Not applicable	
D BIT Lead address of bit device to save the comparison result Not applicable Not applicable N WORD The number of devices to compare			Y, M, UB	
Not applicable X, Y, F, Z, T, C, M, S, L, D, UW, integer N WORD The number of devices to compare	D	BIT	Lead address of bit device to save the comparison result	
NWORDX, Y, F, Z, T, C, M, S, L, D, UW, integerThe number of devices to compare			Not applicable	
N WORD The number of devices to compare			X, Y, F, Z, T, C, M, S, L, D, UW, integer	
	Ν	WORD	The number of devices to compare	
1 to 32			1 to 32	

<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.



5.5.71 Comparison Instruction (CMPL)

Co in	mparison struction	CMPL S1 S2 D N	Applicable model LP-S044, LP-S070,
			LP-A070, LP-A104
OP	DATA type	Available device / Description / Range	
		X, Y, F, Z, T, C, M, S, L, D, UW, integer	Step
S1	INT	Data or data address to compare with S2	
		-32768(h8000) to 32767(hFFFF)	9
		X, Y, F, Z, T, C, M, S, L, D, UW, integer	
S2	INT	Data or data address to compare with S1	
		-32768(h8000) to 32767(hFFFF)	
		Y, M, UB	
D	BIT	Lead address of bit device to save comparison result	
		Not applicable	
		X, Y, F, Z, T, C, M, S, L, D, UW, integer	
Ν	WORD	The number of S2 data to compare with S1 data	
		As many as the number of devices remained in S1, S2 and D area	

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

5.5.72 Comparison Instruction (DCMPL)

OP DATA type Available device / Description / Range X, Y, F, Z, T, C, M, S, L, D, UW, integer	Borro Zero Error
X, Y, F, Z, T, C, M, S, L, D, UW, integer	Step Error Error
S1 DINT Data or data address to compare with S2	≤
-2147483648(h8000000) to 2147483647(h7FFFFFF)	9
X, Y, F, Z, T, C, M, S, L, D, UW, integer	
S2 DINT Data or data address to compare with S1	
-2147483648(h80000000) to 2147483647(h7FFFFFF)	
Y, M, UB	
D BIT Lead address of bit device to save comparison result	
Not applicable	
X, Y, F, Z, T, C, M, S, L, D, UW, integer	
N WORD The number of S2 data to compare with S1 data	
As many as the number of devices remained in S1, S2 and D	area

<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. Comparison executes the Signed operation. (h80000000(-2147483648) to hFFFFFFF(-1) < 0 to h7FFFFFF(2147483647))

5.5.73 Comparison Instruction (BWCMP)

Co in:	mparison struction	BWCMP S1 S2 S3 D	Applicable model
			LP-S044, LP-S070,
			LP-A070, LP-A104
OP	DATA type	Available device / Description / Range	
		X, Y, M, S, T, C, D, Z, F, UW, integer	Ster Bor Car Zen
S1	INT	Data to compare with S2 and S3	o ry row
		-32768(h8000) to 32767(h7FFF)	9
		X, Y, M, S, T, C, D, Z, F, UW, integer	
S2	INT	Data to compare with S1 and S3	
		-32768(h8000) to 32767(h7FFF)	
		X, Y, M, S, T, C, D, Z, F, UW, integer	
S3	INT	Data to compare with S1 and S2	
		-32768(h8000) to 32767(h7FFF)	
		Y, M, UB	
D	BIT	Bit device address to save comparison result	
		Not applicable	

<Ladder>

X00000		1	1 		
	BWCMP	D0000	D0050	D0100	M0000
			1	1	
		1	1	1	END
	÷	÷		÷	

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. Comparison executes the Signed operation.



5.5.74 Comparison Instruction (DBWCMP)

Co in:	mparison struction	DBWCMP S1 S2 S3 D	Applicable model LP-S044, LP-S070,
			LP-A070, LP-A104
OP	DATA type	Available device / Description / Range]
		X, Y, M, S, T, C, D, Z, F, UW, integer	Ste Car Zer
S1	DINT	Data to compare with S2 and S3	
		-2147483648(h80000000) to 2147483647(h7FFFFFF)	9
		X, Y, M, S, T, C, D, Z, F, UW, integer	
S2	DINT	Data to compare with S1 and S3	
		-2147483648(h80000000) to 2147483647(h7FFFFFF)	
		X, Y, M, S, T, C, D, Z, F, UW, integer	
S3	DINT	Data to compare with S1 and S2	
		-2147483648(h80000000) to 2147483647(h7FFFFFF)	
		Y, M, UB	
D	BIT	Bit device address to save comparison result	
		Not applicable	
	<u> </u>]

<Ladder>

X00000			1		
	DBWCMP	D0000	D0050	D0100	M0000
					END
	÷÷				- -

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. Comparison executes the Signed operation.



5.5.75 Transmission Instruction (BMOV)

Trai ins	nsmission struction	BMOV S D	Applicable model LP-S044, LP-S070, LP-A070, LP-A104
OP	DATA type	Available device / Description / Range	
		X, Y, F, T, C, M, UB	Step Borr Carr
S	BIT	Bit device number you want to transmit	
		Not applicable	5
		Y, F, T, C, M, UB	
D	BIT	Bit device address to save the transmitted data	
		Not applicable	

<Ladder>

				Т
X00000	BMOV	ΜΠΠΠΠ	M00002	
····	i Dino i			
			END	
		T	· · · · · ·	

Transmits the source bit to the destination bit.

S bit — D bit

5.5.76 Transmission Instruction (MOV)

Tr i	ansmission Instruction	MOV S	D	Арр	licable model
				LP-	S044, LP-S070,
OP	DATA type	Available device / De	escription / Range]	A070, EI -A104
		X, Y, F, Z, T, C, M, S, L	, D, UW, integer	Erro	Ster Car
S	WORD	Data to transmit or dev	rice number which have the data	or	
		0(h0000) to 65535(hFF	FF)		5
		Y, F, Z, T, C, M, S, L, D	, UW		
D	WORD	Device number to save	e transmitted data		
		0(h0000) to 65535(hFF	FF)		
				-	

<Ladder>

X00000	MOV	D0000	D0002
I			
· · · · · · · · · · · · · · · · · · ·	· · · · · · · · · · · · · · · · · · ·		

Transmits the source word to the destination word.

S word — D word

5.5.77 Transmission Instruction (DMOV)

Trai ins	nsmission struction	DMOV S D	App LP-3	olicab S044	le mo	odel ∙S070),
			LP-	A070	, LP-	A104	1
OP	DATA type	Available device / Description / Range					
		X, Y, F, Z, T, C, M, S, L, D, UW, integer	Erro	Zer	Car	Bor	Stel
S	DWORD	Data to transmit or device number which have the data	Ŋ	0	Ŋ	row	
		0(h0000) to 4294967295(hFFFFFFF)					5
		Y, F, Z, T, C, M, S, L, D, UW					
D	DWORD	Device number to save transmitted data					
		0(h0000) to 4294967295(hFFFFFFF)					

<Ladder>

X00000				
	 	DMOV	D0000	D0002
	I I I			
	 			END
				1

Transmits the source double word to the destination double word.

S double word	\longrightarrow	D double word

5.5.78 Transmission Instruction (BMOVL)



<Ladder>



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



5.5.79 Transmission Instruction (MOVL)

Tra in	nsmission struction	MOVL S	D	Ν		App LP-(LP-/	licab S044 A070	le mo , LP- , LP-	odel S070 A104), 1
OP	DATA type	Available device / D	escripti	on / Range						
		X, Y, F, Z, T, C, M, S,	L, D, UW	, integer		Erro	Zero	Car	Bori	Step
S	WORD	Data to transmit or de	vice num	ber which ha	ve the data	Ÿ	0	Ż	WO.	
		0(h0000) to 65535(hF	FFF)							7
		Y, F, Z, T, C, M, S, L,	D, UW							
D	WORD	Device number to sav	e transm	itted data						
		0(h0000) to 65535(hF	FFF)							
		X, Y, F, Z, T, C, M, S,	L, D, UW	, integer						
Ν	WORD	The number of destin	ation bit o	devices to sav	e the transmitted data					
		To the remained device	ces in cor	responding D) area					

<Ladder>



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



5.5.80 Transmission Instruction (DMOVL)



<Ladder>



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



5.5.81 Transmission Instruction (BMOVG)

Tra in	nsmission struction	BMOVG S D N	App LP- LP-	licable model S044, LP-S070, A070, LP-A104
OP	DATA type	Available device / Description / Range		
		X, Y, F, T, C, M, UB	Erro	Ster Car
S	віт	Bit device number you want to transmit	or	
		Not applicable		7
		Y, F, T, C, M, UB		
D	BIT	Bit device address to save the transmitted data		
		Not applicable		
		X, Y, F, Z, T, C, M, S, L, D, UW, integer		
Ν	WORD	The number of bit devices to save to be transmitted data and the transmitted data		
		To the remained devices in corresponding S, D areas		

<Ladder>



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



5.5.82 Transmission Instruction (MOVG)



<Ladder>



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



5.5.83 Transmission Instruction (DMOVG)

Tra in:	nsmission struction	DMOVG S D N	App LP-/	blicable model S044, LP-S070, A070, LP-A104
OP	DATA type	Available device / Description / Range		
		X, Y, F, Z, T, C, M, S, L, D ,UW	Errc	Ster Car
S	DWORD	Data to transmit or device number which have the data	٥r	
		0(h0000) to 4294967295(hFFFFFFF)		7
		Y, F, Z, T, C, M, S, L, D ,UW		
D	DWORD	Device number to save transmitted data		
		0(h0000) to 4294967295(hFFFFFFF)		
		X, Y, F, Z, T, C, M, S, L, D ,UW, integer		
Ν	WORD	The number of bit devices to save to be transmitted data and the transmitted data		
		To the remained devices in corresponding S, D areas		

<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.



5.5.84 Transmission Instruction (BCMOV)

Trai ins	nsmission struction	BCMOV S D	Арр	licable model
			LP-	A070, LP-A104
OP	DATA type	Available device / Description / Range		, -
		X, Y, F, T, C, M, UB	Erro	Ster Car
S	віт	Bit device number you want to transmit) r	
		Not applicable		5
		Y, F, T, C, M, UB		
D	BIT	Bit device address to save the transmitted data		
		Not applicable		

<Ladder>

X00000			
	BCM	MOO000 MOO000	M00050
	1		
-	1		END
	· · · · · · · · · · · · · · · · · · ·		

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

S(Source)		D(Destination)
ON	Reverse	OFF

5.5.85 Transmission Instruction (CMOV)

Trai ins	nsmission struction	CMOV S E	0	Арр	licable model
				LP-S	S044, LP-S070,
				LP-/	4070, LP-A104
OP	DATA type	Available device / Descri	iption / Range		
		X, Y, F, Z, T, C, M, S, L, D, U	JW, integer	Erro	Ster Zer
S	WORD	Data to transmit or device n	number which have the data	or	
		0(h0000) to 65535(hFFFF)			5
		Y, F, Z, T, C, M, S, L, D, UW	1		
D	WORD	Device number to save tran	smitted data		
		0(h0000) to 65535(hFFFF)			

<Ladder>

X00000			1	
		CMOV	M0000	M0050
				END
	÷÷			

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

S(Source)	_	D(Destination)
h0000	Reverse	hFFFF

5.5.86 Transmission Instruction (DCMOV)

Tra ir	ansmission astruction	DCMOV S D	Applicable model
			LP-S044, LP-S070,
			LP-A070, LP-A104
OP	DATA type	Available device / Description / Range	
		X, Y, F, Z, T, C, M, S, L, D, UW, integer	Ster Borr Zerr
S	DWORD	Data to transmit or device number which have the data	
		0(h0000) to 4294967295(hFFFFFFF)	5
		Y, F, Z, T, C, M, S, L, D, UW	
D	DWORD	Device number to save transmitted data	
		0(h0000) to 4294967295(hFFFFFFF)	

<Ladder>

X00000		ΜΟΟΟΟ	M0050
	- <mark> </mark>		
		 	<u></u>

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

S(Source)	Povoroo	D(Destination)
h0000FFFF		hFFFF0000

5.5.87 Exchange Instruction (XCH)

E) ins	change struction	XCH S1	S2	App LP-:	licable model S044, LP-S070,
_				LP-/	A070, LP-A104
OP	DATA type	Available device / D	escription / Range		
		Y, F, Z, T, C, M, S, L, I	D, UW	Erro	Ster Zer
S1	WORD	Data device number to	b be exchanged	Ÿ	
		0(h0000) to 65535(hF	FFF)		5
		Y, F, Z, T, C, M, S, L, I	D, UW		
S2	WORD	Data device number to	b be exchanged		
		0(h0000) to 65535(hF	FFF)		

<Ladder>

X00000	ХСН	ΜΠΟΠΟ	M0050
	7,011	100000	MOODO
		1	END L
·			
			•

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

(S1) <

5.5.88 Exchange Instruction (DXCH)

E) ins	change struction	DXCH S1 S2	Арр	blicable model
			LP- LP-	-S044, LP-S070, -A070, LP-A104
OP	DATA type	Available device / Description / Range	7	
		Y, F, Z, T, C, M, S, L, D, UW	Erro	Ste Bor Zer
S1	DWORD	Data device number to be exchanged	Ĩ	
		0(h0000) to 4294967295(hFFFFFFF)		5
		Y, F, Z, T, C, M, S, L, D, UW		
S2	DWORD	Data device number to be exchanged		
		0(h0000) to 4294967295(hFFFFFFF)		
			_	

<Ladder>

x00000	DXCH	M0000	M0050
			END

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

$(S1) \qquad \longleftrightarrow \qquad (S2)$
5.5.89 Exchange Instruction (AXCH)

E) ins	change struction	AXCH S1 S2 N	Apr LP- LP-	olicat S044 A070	ole mo I, LP-), LP-	odel S070 A104), 1
OP	DATA type	Available device / Description / Range					
		Y, F, T, C, M, UB	Erro	Zer	Car	Bor	Stel
S1	віт	Bit device address of the data to be exchanged	or	0	Ŋ	row	0
		Not applicable					7
		Y, F, T, C, M, UB					
S2	BIT	Bit device address of the data to be exchanged					
		Not applicable					
		Y, F, Z, T, C, M, S, L, D, UW, integer					
Ν	WORD	The number of the data bits to be exchanged					
		To the device range remained in corresponding S1 and S2 areas.					

<Ladder>



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



5.5.90 Exchange Instruction (SWAP)

E) ins	change struction	SWAP	D	Арр	olicable m	nodel	
				LP-	S044, LF	P-S070,	
_				LP-	A070, LF	P-A104	
OP	DATA type	Available device	e / Description / Range				
		Y, F, Z, T, C, M, S	, L, D, UW	Errc	Carı Zero	Borr	Ster
D	WORD	Data address to e	exchange upper and lower bit	٥r		NOV 1	
		0(h0000) to 6553	5(hFFFF)			3	;
		•					

<Ladder>



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



5.5.91 Exchange Instruction (DSWAP)

Exchange instruction		DSWAP	D	App LP-\$	licat S044	ole mo I, LP-	odel -S07(0,
				LP-/	A070), LP-	-A104	4
OP	DATA type	Available device	/ Description / Range					
		Y, F, Z, T, C, M, S,	L, D, UW	Erro	Zer	Car	Bon	Ste
D	DWORD	Data address to ex	xchange upper and lower bit	Ÿ	0	Ŋ	row	0
		0(h0000) to 42949	67295(hFFFFFFF)					3

<Ladder>

×00000		DSWAP	M0000
			END

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



5.5.92 Rotation Instruction (ROR)

Rotation instruction		ROR	S	С	Арр	licab	le mo	odel	
					LP-\$	S044	, LP-	·S070),
					LP-/	4070), LP-	A104	ŀ
OP	DATA type	Available device	e / Des	cription / Range					
		Y, F, Z, T, C, M, S	, L, D, l	JW	Erro	Zer	Car	Bor	Ste
S	WORD	Data address to e	xecute	the operation	Ÿ	0	Ŋ	row	0
		0(h0000) to 6553	5(hFFFI	F)					5
		X, Y, F, Z, T, C, M	, S, L, C), UW, integer					
С	WORD	The number of bit	s to rota	ate right side					
		0 to 255							

<Ladder>

X00000			1 1	
	1	ROR	M0000	3
				END
·			÷	

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



5.5.93 Rotation Instruction (DROR)

Rotation instruction		DROR S (C	App LP-\$ LP- <i>4</i>	licable model 5044, LP-S070, 4070, LP-A104
OP	DATA type	Available device / Descri	iption / Range		
		X, F, Z, T, C, M, S, L, D, UW	l	Erro	Ster Bon Car
S	DWORD	Data address to execute the	e operation) Y	
		0(h0000) to 4294967295(hF	FFFFFF)		5
		X, Y, F, Z, T, C, M, S, L, D, U	JW, integer		
С	WORD	The number of bits to rotate	e right side		
		0 to 255			

<Ladder>

X00000	DROR	M0000	
			I

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



5.5.94 Rotation Instruction (AROR)

R ins	otation struction	AROR S N C	Applicable model LP-S044, LP-S070, LP-A070, LP-A104
OP	DATA type	Available device / Description / Range	
		Y, F, T, C, M, UB	Ster Car Zero
S	віт	Start address for bit device of the data to execute the operation	
		Not applicable	
		X, Y, F, Z, T, C, M, S, L, D, UW, integer	
Ν	WORD	The number of bit device to execute the operation from start address	
		To the remained device range in corresponding S area]
		X, Y, F, Z, T, C, M, S, L, D, UW, integer	
С	WORD	The number of bits to rotate right side	
	0 to 255		

<Ladder>



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



5.5.95 Rotation Instruction (RORC)

F in	otation struction	RORC S C	Applicable model LP-S044, LP-S070,
			LP-A070, LP-A104
OP	DATA type	Available device / Description / Range	
		Y, F, Z, T, C, M, S, L, D, UW	Errc Car Errc
S	WORD	Data address to execute the operation	
		0(h0000) to 65535(hFFFF)	
		X, Y, F, Z, T, C, M, S, L, D, UW, integer	
С	WORD	The number of bits to rotate right side	
		0 to 255	

<Ladder>

X00000		1 1	I
	RORC	M0000	3
-			END
		T	

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



5.5.96 Rotation Instruction (DRORC)

R ins	Rotation DRORC S C instruction		App	licable model S044, LP-S070,
			LP-/	AU70, LP-A104
OP	DATA type	Available device / Description / Range		
		Y, F, Z, T, C, M, S, L, D, UW	Erro	Ster Bor Car
S	DWORD	Data address to execute the operation) r	
		0(h0000) to 4294967295(hFFFFFFF)		◎ 5
		X, Y, F, Z, T, C, M, S, L, D, UW, integer		
С	WORD	The number of bits to rotate right side		
		0 to 255		

<Ladder>

X00000	DRORC	M0000	3
			END

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



5.5.97 Rotation Instruction (ARORC)

i	Rotation nstruction	ARORC	S	Ν	С			App LP-: LP-/	licable model S044, LP-S070, A070, LP-A104
OP	DATA type	Available devic	e / De	scriptio	on / Ra	nge			
		Y, F, T, C, M, UB						Erro	Ster Car
S	BIT	Start address for	bit dev	ice of th	e data	o execute the operation	on	Ÿ	p ry row
		Not applicable							◎ 7
		X, Y, F, Z, T, C, N	/I, S, L,	D, UW,	integer		L		
N	WORD	The number of b address	it devic	e to exe	cute the	e operation from start			
		To the remained	device	range ir	n corres	ponding S area			
		X, Y, F, Z, T, C, M, S, L, D, UW, integer							
C	WORD	ORD The number of bits to rotate right side							
		0 to 255							

<Ladder>



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



5.5.98 Rotation Instruction (ROL)

Rotation instruction ROL S C		с		Арр	licab	le m	odel			
				LP-S044, LP-S070,			,			
				LP-A	4070), LP-	A104			
OP	DATA type	Available device	e / Des	cription / Range						
		Y, F, Z, T, C, M, S	, L, D, L	IW		Erro	Zer	Car	Bor	Ste
S	WORD	Data address to e	xecute	the operation		q	0	Ϋ́	row	σ
		0(h0000) to 6553	n0000) to 65535(hFFFF)							5
		X, Y, F, Z, T, C, M	Y, F, Z, T, C, M, S, L, D, UW, integer							
С	WORD	The number of bit	e number of bits to rotate left side							
		0 to 255	o 255							

<Ladder>

X00000				
		ROL	M0000	3
	I I			
				END
	· · · · · · · · · · · · · · · · · · ·			

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



5.5.99 Rotation Instruction (DROL)

Rotation instruction		DROL S C		Applicable model			
					LP-	S044, LP-S070,	
					LP-/	A070, LP-A104	
OP	DATA type	Available device / [Description / Range				
		Y, F, Z, T, C, M, S, L,	D, UW		Erro	Ste Car	
S	DWORD	Data address to exec	ute the operation		Ÿ		
		0(h0000) to 42949672	295(hFFFFFFF)			5	
		X, Y, F, Z, T, C, M, S,	Y, F, Z, T, C, M, S, L, D, UW, integer				
С	WORD	The number of bits to	ne number of bits to rotate left side				
		0 to 255	to 255				
		•					

<Ladder>

X00000		MOOOO	
		MOCOO	
	 	 	END

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

B31	В0
C < 1 0 1 1 0 0 1 1 1 0 0	
The highest bit rotates with carry bit and the lowest bit	Rotates to the left side by the number of N bits

5.5.100 Rotation Instruction (AROL)

R ins	otation struction	AROL	S	Ν	С		App LP- LP-	olicable moo S044, LP-S A070, LP-A	del 6070, 104
OP	DATA type	Available device	e / Des	criptio	n / Range				
		Y, F, T, C, M, UB					Erro	Car Zer	Step
S	віт	Start address for I	oit devi	ce of th	e data to ex	ecute the operation) Y	0 Z	
	Not applicable						\odot	7	
		X, Y, F, Z, T, C, M,	S, L, D	D, UW, i	nteger				
Ν	WORD	The number of bit address	The number of bit device to execute the operation from start address						
		To the remained c	To the remained device range in corresponding S area						
	X, Y, F, Z, T, C, M, S, L, D, UW, integer								
С	C WORD The number of bits to rotate left side								
		0 to 255							

<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.



5.5.101 Rotation Instruction (ROLC)

R in:	otation struction	ROLC S C	Applicable model LP-S044, LP-S070, LP-A070, LP-A104
OP	DATA type	Available device / Description / Rang	je
		Y, F, Z, T, C, M, S, L, D, UW	ErrcBor
S	WORD	Data address to execute the operation	
		0(h0000) to 65535(hFFFF)	
		X, Y, F, Z, T, C, M, S, L, D, UW, integer	
С	WORD	The number of bits to rotate right side	
		0 to 255	

<Ladder>

X00000	i i			I
-		ROLC	M0000	3
				END

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



5.5.102 Rotation Instruction (DROLC)

R ins	Rotation DROLC S C		App LP-3	licable model S044, LP-S070,
			LP-/	A070, LP-A104
OP	DATA type	Available device / Description / Range		
		Y, F, Z, T, C, M, S, L, D, UW	Erro	Step Born Car
S	DWORD	Data address to execute the operation	٥r	
		0(h0000) to 4294967295(hFFFFFFF)		5
		X, Y, F, Z, T, C, M, S, L, D, UW, integer		
С	WORD	The number of bits to rotate left side		
		0 to 255		

<Ladder>

X00000	DROLC	M0000	3
	 		END

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



5.5.103 Rotation Instruction (AROLC)

l in	Rotation Instruction	AROLC	S	Ν	С			App LP-3 LP-4	licable model S044, LP-S070, A070, LP-A104
OP	DATA type	Available dev							
		Y, F, T, C, M, U	В	Erro	Ster Car				
S	S BIT Start address for bit device of the data to execute the operation								
	Not applicable								◎ 7
		X, Y, F, Z, T, C,	M, S, L	., D, UW	/, integ	er			
Ν	WORD	The number of address	bit dev	ice to ex	cecute	the operation fro	om start		
		To the remaine	d devic	e range	in cori	responding S ar	ea		
		X, Y, F, Z, T, C,							
С	C WORD The number of bits to rotate left side								
	0 to 255								

<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.



5.5.104 Movement Instruction (SFTR)

Mo	ovement struction	SFTR	S	Ν		Арр	licab	le mo	odel	h	
						LP-A070, LP-A104					
OP	DATA type	Available device	ailable device / Description / Range								
		Y, F, Z, T, C, M, S,	F, Z, T, C, M, S, L, D, UW								
S	WORD	Data address to e	ata address to execute the operation								
		0(h0000) to 65535	6(hFFF	=)				\bigcirc		9	
		X, Y, F, Z, T, C, M,	Y, F, Z, T, C, M, S, L, D, UW, integer								
Ν	WORD	The number of bits	e number of bits to rotate right side								
		0 to 16									

<Ladder>

X00000			
	SFTR	M00000	3
	1		END

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.



5.5.105 Movement Instruction (ASFTR)

Movement instruction		ASFTR S	5	N1	I	N2		App LP-\$ LP-/	licat S044 A070	ole m 4, LP-), LP-	odel -S07(-A104	D, 4
OP DATA type Available device / Description / Range												
		Y, F, T, C, M, UB	F, T, C, M, UB									Step
S	BIT	Start bit position of the data to execute the operation						٥r	0	7	, MO,	0
	Not applicable											9
		X, Y, F, Z, T, C, M, S	S, L, D), UW, i	nte	eger						
N1	WORD	The number of bits	from t	he desi	igr	nated position as S						
		0 to 32										
	X, Y, F, Z, T, C, M, S, L, D, UW, integer											
N2	N2 WORD The number of bits to rotate right side											
0 to 32												

<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".



5.5.106 Movement Instruction (SFTL)

Mo ins	ovement struction	SFTL	S	Ν		Арр	licat	ole m	odel	
						LP-	S044	ŀ, LP∙	-S07(О,
			LP-A070, LP-A104							
OP	DATA type	Available device	vailable device / Description / Range							
		Y, F, Z, T, C, M, S	F, Z, T, C, M, S, L, D, UW							
S	WORD	Data address to e	xecute	the operation		Ÿ	0	Γ,	row	σ
		0(h0000) to 6553	5(hFFFI	=)				\bigcirc		9
		X, Y, F, Z, T, C, M	Y, F, Z, T, C, M, S, L, D, UW, integer							
Ν	WORD	The number of bit	ne number of bits to rotate left side							
		0 to 16	to 16							

<Ladder>

X00000			
	SFIL	M00000	3
	1		
		i i	END
· · · · · · · · · · · · · · · · · · ·		÷	ù

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.



5.5.107 Movement Instruction (ASFTL)

Mo	ovement struction	ASFTL	S	N1		N2		App LP-: LP-/	olicat S044 A070	ole m 1, LP·), LP·	odel -S07(-A104	0, 4		
OP DATA type Available device / Description / Range														
		Y, F, T, C, M, UB	F, T, C, M, UB									Step		
S	BIT	Start bit position	Start bit position of the data to execute the operation						0	Ŋ	, OM			
	Not applicable											9		
		X, Y, F, Z, T, C, N	I, S, L,	D, UW, i	inte	eger								
N1	WORD	The number of b	its from	the des	sigr	nated position as S								
		0 to 32												
	X, Y, F, Z, T, C, M, S, L, D, UW, integer													
N2	N2 WORD The number of bits to rotate left side													
0 to 32														

<Ladder>



1. From the source bit, N1 bits moves to the left side 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".



5.5.108 Movement Instruction (WSFTR)

Mo ins	ovement struction	WSFTR S N1 N2	App LP-/	olicat S044 A070	₀le m₀ ŀ, LP-), LP-	odel -S07 -A10	0, 4
OP	DATA type	Available device / Description / Range					
		Y, F, Z, T, C, M, S, L, D, UW	Errc	Zero	Carı	Borr	Step
S	WORD	Data address to execute the operation	r y w				
		0(h0000) to 65535(hFFFF)					9
		X, Y, F, Z, T, C, M, S, L, D, UW, integer					
N1	WORD	The number of words from the designated position as S					
		To the remained device range in corresponding S area					
N2	WORD	The number of words to move to the right					
L	I						

<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.



5.5.109 Movement Instruction (WSFTL)

Movement instruction		WSFTL S N1 N	12	App	licab S044	le mo , LP-	odel S070),
OP	DATA type	Range						
		Y, F, Z, T, C, M, S, L, D, UW	Erro	Zer	Car	Bor	Ste	
S	WORD	Data address to execute the operati	ion	q	0	Γ,	row	σ
		0(h0000) to 65535(hFFFF)						9
		X, Y, F, Z, T, C, M, S, L, D, UW, integ	ger					
N1	WORD	The number of words from the desig	gnated position as S					
		To the remained device range in co	rresponding S area					
		ger						
N2	V2 WORD The number of words to move to the left							
		1 value						

<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.



5.5.110 Arithmetic Operation Instruction (ADD)



<Ladder>

X00000				
	ADD	M0000	M0050	M0100
1				END
			· · · · · · · · · · · · · · · · · · ·	

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 hFFF(-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.

S1(Source1) + S2(Source2) - D(Destination)	word		word		word
	S1(Source1)	+	S2(Source2)	\longrightarrow	D(Destination)

5.5.111 Arithmetic Operation Instruction (DADD)

Ar oj ins	ithmetic peration struction	DADD	S1	S2	D		App LP-\$ LP-4	licable n S044, LF A070, LF	nodel 2-S070, 2-A104	3
OP	DATA type	Available dev	vice / Des							
		X, Y, F, Z, T, C	, M, S, L,	D, UW,	integer		Errc	Car Zero	Bon	Ste
S1	DINT	Data address	to execute	the ado	dition operation wi	th S2	Ÿ	° 7	row	σ
		-2147483648(h8000000	0) to 21	47483647(h7FFFI	FFF)		\bigcirc		7
		X, Y, F, Z, T, C	, M, S, L,	D, UW,	integer					
S2	DINT	Data address	to execute	the ado	dition operation wi	th S1				
		-2147483648(h8000000	0) to 21	47483647(h7FFFI	FFF)				
		Y, F, Z, T, C, N	, S, L, D,							
D	D DINT Address to save the operation result									
		-2147483648(h8000000	0) to 21	47483647(h7FFFI	FFF)				

<Ladder>

X00000	DADD	M0000	M0050	M0100
				END

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.

(h8000000(-2147483648) to hFFFFFF(-1) <

0 to h7FFFFFF(2147483647))

3. If the result value exceeds 'h7FFFFFF

(2147483647)', carry flag is SET.

4. If the result value is 'h00000000', zero flag is SET.



5.5.112 Arithmetic Operation Instruction (ADDU)

Ari op ins	ithmetic peration struction	ADDU	S1	S2	D		App LP LP-2	olicat S044 A070	ole mo 1, LP-), LP-	odel ∙S07(•A104	D, 4
OP	DATA type	Available dev	ice / Des	criptio	n / Range						
		X, Y, F, Z, T, C,	M, S, L, [D, UW, i	nteger		Erro	Zero	Car	Bori	Step
S1	WORD	Data address to	Jata address to execute the addition operation with S2								
		0(h0000) to 65	535(hFFF	F)				\odot	\bigcirc		7
		X, Y, F, Z, T, C,	M, S, L, I	D, UW, i	nteger						
S2	WORD	Data address t	o execute	the add	lition operat	tion with S1					
		0(h0000) to 65	535(hFFF	F)							
		Y, F, Z, T, C, M,	S, L, D, I	JW							
D	WORD	Address to sav									
		0(h0000) to 65	535(hFFF	F)							

<Ladder>

X00000				
	ADDU	M0000	M0050	M0100
1		1		END

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.



5.5.113 Arithmetic Operation Instruction (DADDU)

Ar oj ins	ithmetic oeration struction	DADDU	S1	S 2	D		App LP-: LP-:	olicab S044 A070	le mo , LP-), LP-	odel S070 A104), 1
OP	DATA type	Available devic	e / Des	criptio	on / Range						
		X, Y, F, Z, T, C, N	1, S, L, I	D, UW, i	integer		Erro	Zerc	Carı	Borr	Step
S1	DWORD	Data address to	ata address to execute the addition operation with S2								
		0(h0000) to 4294	967295	ō(hFFFF	FFFF)			\bigcirc	\bigcirc		7
		X, Y, F, Z, T, C, N	1, S, L, I	D, UW, i	integer						
S2	DWORD	Data address to	execute	the add	dition operation with S ²						
		0(h0000) to 4294	967295	5(hFFFF	FFFF)						
		Y, F, Z, T, C, M, S	, F, Z, T, C, M, S, L, D, UW								
D	DWORD	Address to save	ddress to save the operation result								
		0(h0000) to 4294	967295	5(hFFFF	FFFF)						

<Ladder>

X00000	DADDU	M0000	M0050	M0100
	-			END

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 'hFFFFFFF (4294967295)', carry flag is SET.

4. If the result value is 'h0000', zero flag is SET.



5.5.114 Arithmetic Operation Instruction (ADDL)

Ar oj ins	ithmetic peration struction	ADDL	S1	S2	D	Ν		Applicable model							
											LP-S044, LP-S070,				
0.0	DATA	A	reilable device / Description / Pange									ł			
OP	DATA type	Available devi	ce / Des	criptio	n / Ra	nge						1-			
		X, Y, F, Z, T, C,	M, S, L, I	D, UW, i	nteger			Err	Zer	Car	Bor	Ste			
S1	INT	Data address to	ata address to execute the addition operation with S2									ö			
		-32768(h8000)	32768(h8000) to 32767(h7FFF)									9			
		X, Y, F, Z, T, C,	, Y, F, Z, T, C, M, S, L, D, UW												
S2	INT	Data address to	execute	the add	dition o	peration	with S1								
		-32768(h8000)	to 32767	(h7FFF))										
		Y, F, Z, T, C, M,	S, L, D, I	JW											
D	INT	Address to save	e the ope	ration re	esult										
		-32768(h8000)	to 32767	(h7FFF))										
		X, Y, F, Z, T, C,	K, Y, F, Z, T, C, M, S, L, D, UW, integer												
Ν	WORD	The number of operation with S	The number of S2 data address and saved address to execute the operation with S1												
		In the range wit	hin the co	orrespor	nding c	levice are	ea of S2 and D								

<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))





5.5.115 Arithmetic Operation Instruction (DADDL)

Ar oj ins	ithmetic peration struction	DADDL S1 S2 D N	App LP-	licat S044	ole mo	odel S07	0,
OP	DATA type	Available device / Description / Range	LP-/	A070), LP-	A104	4
		X, Y, F, Z, T, C, M, S, L, D, UW, integer	Щ	Zei	Ca	Во	Ste
S1	DINT	Data address to execute the addition operation with S2	0r	ſo	rry	rrow	ġ
		-2147483648(h80000000) to 2147483647(h7FFFFFF)		\bigcirc	\bigcirc		9
		X, Y, F, Z, T, C, M, S, L, D, UW					
S2	DINT	Data address to execute the addition operation with S1					
		-2147483648(h80000000) to 2147483647(h7FFFFFF)					
		Y, F, Z, T, C, M, S, L, D, UW					
D	DINT	Address to save the operation result					
		-2147483648(h80000000) to 2147483647(h7FFFFFF)					
		X, Y, F, Z, T, C, M, S, L, D, UW, integer					
Ν	WORD	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]				

<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 hFFFFFFF(-1) < 0 to h7FFFFFF(2147483647))

3. If the result value is 'h00000000', zero flag is SET.



5.5.116 Arithmetic Operation Instruction (ADDLU)

Ar oj ins	ithmetic oeration struction	ADDLU S1 S2 D N	Applicable model LP-S044, LP-S070,					
OP		Available device / Description / Bange	LP-	A070, LP-A104	Ļ			
OF	DATA type	Available device / Description / Kange						
		X, Y, F, Z, T, C, M, S, L, D, UW, integer	Erro	Zer Zer	Ste			
S1	WORD	Data address to execute the addition operation with S2	or	row ry	p			
		0(h0000) to 65535(hFFFF)		\bigcirc \bigcirc	9			
		X, Y, F, Z, T, C, M, S, L, D, UW						
S2	WORD	Data address to execute the addition operation with S1						
		0(h0000) to 65535(hFFFF)						
		Y, F, Z, T, C, M, S, L, D, UW						
D	WORD	Address to save the operation result						
		0(h0000) to 65535(hFFFF)						
		X, Y, F, Z, T, C, M, S, L, D, UW, integer						
Ν	WORD	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						

<Ladder>



 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.
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.



5.5.117 Arithmetic Operation Instruction (DADDLU)

Ar or ins	ithmetic peration struction	DADDLU S1 S2 D N	Applicable model						
			LP-S044, LP-S070,						
			LP-A070, LP-A104						
OP	DATA type	Available device / Description / Range							
		X, Y, F, Z, T, C, M, S, L, D, UW, integer	Errc						
S1	DWORD	Data address to execute the addition operation with S2							
		0(h0000) to 4294967295(hFFFFFFF)	0 0 9						
		X, Y, F, Z, T, C, M, S, L, D, UW							
S2	DWORD	Data address to execute the addition operation with S1							
		0(h0000) to 4294967295(hFFFFFFF)							
		Y, F, Z, T, C, M, S, L, D, UW							
D	DWORD	Address to save the operation result							
		0(h0000) to 4294967295(hFFFFFFF)							
		X, Y, F, Z, T, C, M, S, L, D, UW, integer]						
Ν	WORD	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]						

<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

- 3. If the result value exceeds 'hFFFFFFF
- (4294967295)', carry flag is SET.
- 4. If the result value is 'h0000', zero flag is SET.





Ar oj ins	ithmetic oeration struction	SUB	S1	S 2	D			App LP- LP-	olicat S044 A070	ole mo 1, LP-), LP-	odel ∙S07(•A104	D, 4
OP	DATA type	Available de	vice / Des	criptio	n / Rang	je						
		X, Y, F, Z, T, C	, M, S, L, I	D, UW, i	integer			Erro	Zer	Car	Bori	Stel
S1	INT	Data address	Data address to execute the subtraction operation with S2								row	0
		-32768(h8000) to 32767	(h7FFF)				\bigcirc		\bigcirc	7
		X, Y, F, Z, T, C	, M, S, L, I	D, UW, i	integer							
S2	INT	Data address	to execute	the sub	otraction	operation with S	1					
		-32768(h8000) to 32767	(h7FFF)							
		Y, F, Z, T, C, N	1, S, L, D, I	JW								
D	INT	Address to sa	ve the ope	ration re	esult							
		-32768(h8000) to 32767	(h7FFF)							
								•				

5.5.118 Arithmetic Operation Instruction (SUB)

<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.

word word word
S1(Source1) — S2(Source2) — D(Destination)

Ar oj ins	rithmetic peration struction	DSUB S1 S2 D						Applicable model						
								LP-	S044	1, LP∙	-S07	0,		
_								LP-A070, LP-A104						
OP	DATA type	Available de	vice / Des	criptio	n / Rang	e								
		X, Y, F, Z, T, C	, M, S, L, I	D, UW, i	integer			Erro	Zer	Car	Bor	Ste		
S1	DINT	Data address	ata address to execute the subtraction operation with S2								row	δ		
		-2147483648(h8000000	D) to 21	47483647	7(hFFFFFFF)			\bigcirc		\bigcirc	7		
		X, Y, F, Z, T, C	, M, S, L, I	D, UW, i	integer									
S2	DINT	Data address	to execute	the sub	otraction o	operation with S1								
		-2147483648(h8000000	0) to 21	47483647	7(hFFFFFFF)								
		Y, F, Z, T, C, N	1, S, L ,D, l	JW										
D	DINT	Address to sa	ve the ope	ration re	esult									
		-2147483648(h8000000	0) to 21	47483647	7(hFFFFFFF)								

5.5.119 Arithmetic Operation Instruction (DSUB)

<Ladder>

X00000				
	DSUB	M0000	M0050	M0100
		· · · · · · · · · · · · · · · · · ·		

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 hFFFFFFF(-1) < 0 to h7FFFFFF(2147483647))

3. If the result value is 'h00000000', zero flag occurs.



Step

Arithmetic operation SUBU **S1 S2** D Applicable model instruction LP-S044, LP-S070, LP-A070, LP-A104 OP DATA type Available device / Description / Range Error Carry ∠ero X, Y, F, Z, T, C, M, S, L, D, UW, integer Borrow Data address to execute the subtraction operation with S2 **S1** WORD 0(h0000) to 65535(hFFFF) X, Y, F, Z, T, C, M, S, L, D, UW, integer WORD Data address to execute the subtraction operation with S1 **S2** 0(h0000) to 65535(hFFFF) Y, F, Z, T, C, M, S, L, D, UW D WORD Address to save the operation result

5.5.120 Arithmetic Operation Instruction (SUBU)

<Ladder>

×00000		1		: I
	SUBU	M0000	M0050	M0100
				END
			÷	 ł

0(h0000) to 65535(hFFFF)

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.



5.5.121 Arithmetic Operation Instruction (DSUBU)

Ar oj ins	ithmetic peration struction	DSUBU	S1	S2	D		App LP-	licabl	le mo , LP-{	del 5070	,
OP	DATA type	Available device	/ Des	criptio	n / Range			A070,	, LP-4	104	
•	27117190	X. Y. F. Z. T. C. M.	S. L. D). UW. i	nteger		Ē	Ze	S.	B	St
S1	DWORD	Data address to execute the subtraction operation with S2							irry	rrow	da
		0(h0000) to 4294967295(hFFFFFFF)								0	7
		X, Y, F, Z, T, C, M,	S, L, C	D, UW, i	nteger					1	
S2	DWORD	Data address to execute the subtraction operation with S1									
		0(h0000) to 4294967295(hFFFFFFF)									
	Y, F, Z, T, C, M, S, L, D, UW										
D	DWORD	Address to save the operation result									
		0(h0000) to 4294967295(hFFFFFFF)									

<Ladder>

X00000		MODOO	M0050	M0400
	DSOBO	MUUUU	MUUSU	MUTUU
		1		END
	· ÷	÷	÷	÷-

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.



5.5.122 Arithmetic Operation Instruction (SUBL)

Arithmetic operation instruction		SUBL	S1	S2	D	N	Ν	I		App LP-	olicat S044	ole m 1, LP·	odel -S07(D,
	DATA tuma			orintio						LP-/	A070), LP·	A104	4
UP	DATA type	Available dev	ice / Des	scriptio	п / ка	nge								
		X, Y, F, Z, T, C,	M, S, L, I	D, UW,	integer					Ē	Zer	Car	Bor	Ste
S1	INT	Data address t	o execute	the sul	otractio	n opera	tion	with S2		or	Ó	YI.	row	ρ
		-32768(h8000)	to 32767	(h7FFF)						\bigcirc		\bigcirc	9
		X, Y, F, Z, T, C,	M, S, L, I	D, UW										
S2	INT	Data address to execute the subtraction operation with S1												
		-32768(h8000) to 32767(h7FFF)												
		Y, F, Z, T, C, M	Y, F, Z, T, C, M, S, L, D, UW											
D	INT	Address to save the operation result												
		-32768(h8000) to 32767(h7FFF)												
		X, Y, F, Z, T, C,	M, S, L,	D, UW,	integer									
Ν	WORD	The number of operation with	S2 data a S1	address	and sa	aved ad	dres	s to exec	ute the					
		In the range wi	thin the c	orrespo	nding c	levice a	rea o	of S2 and	d D					

<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 double words beginning with the word D.

2. Executes the Signed operation.

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

3. If the result value is 'h0000', zero flag occurs.



Arithmetic operation instruction		DSUBL S2 D N						Applicable model					
							LP-	S044	ŀ, LP∙	-S07	0,		
							LP-	A070), LP·	-A10	4		
OP	DATA type	Available device /	Descriptio	n / Ra	nge								
		X, Y, F, Z, T, C, M, S	, L, D, UW, i	nteger			Erro	Zer	Car	Bor	Ste		
S1	DINT	Data address to exe	cute the sub	otractio	n operatio	n with S2	or	0	γ	row	σ		
		-2147483648(h8000	0000) to 214	474836	647(h7FFF	FFFF)		\bigcirc		\bigcirc	9		
		X, Y, F, Z, T, C, M, S	, L, D, UW										
S2	DINT	Data address to execute the subtraction operation with S1											
		-2147483648(h80000000) to 2147483647(h7FFFFFFF)											
		Y, F, Z, T, C, M, S, L	, D, UW										
D	DINT	Address to save the operation result											
		-2147483648(h80000000) to 2147483647(h7FFFFFF)											
		X, Y, F, Z, T, C, M, S	, L, D, UW, i	nteger									
Ν	WORD	The number of S2 d operation with S1	ata address	and sa	aved addre	ess to execute the							
		In the range within t	he correspor	nding c	levice area	a of S2 and D]						

5.5.123 Arithmetic Operation Instruction (DSUBL)

<Ladder>





5.5.124 Arithmetic Operation Instruction (SUBLU)

Ar or ins	ithmetic peration struction	SUBLU	S1	S2	D	N		App LP-	olicab S044	le m	odel -S07().
								LP-	A070	, , LP·	-A104	4
OP	DATA type	Available devi	ce / Des	criptio	n / Ra	nge						
		X, Y, F, Z, T, C, I	И, S, L, I	D, UW, i	nteger	-		Erro	Zer	Car	Bor	Ste
S1	WORD	Data address to	execute	the sub	otractio	n opera	tion with S2	or	0	Ϋ́	row	q
		0(h0000) to 655	35(hFFF	F)					\bigcirc		\bigcirc	9
		X, Y, F, Z, T, C, I	И, S, L, I	D, UW								
S2	WORD	Data address to	execute	the sub	otractio	n opera	tion with S1					
		0(h0000) to 65535(hFFFF)										
		Y, F, Z, T, C, M,	S, L, D, I	JW								
D	WORD	Address to save the operation result										
		0(h0000) to 65535(hFFFF)										
		X, Y, F, Z, T, C, M, S, L, D, UW, integer										
Ν	WORD	The number of S operation with S	S2 data a 1	address	and sa	ved ad	dress to execute the					
		In the range with	nin the co	orrespor	nding d	evice a	rea of S2 and D					

<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 out of this, borrow flag occurs.

4. If the result value is 'h0000', zero flag occurs.




5.5.125 Arithmetic Operation Instruction (DSUBLU)

Ari op ins	ithmetic peration struction	DSUBLU S1 S2 D N	Applicable model LP-S044, LP-S070, LP-A070, LP-A104
OP	DATA type	Available device / Description / Range	
		X, Y, F, Z, T, C, M, S, L, D, UW, integer	Ster Born Carr Zero
S1	DWORD	Data address to execute the subtraction operation with S2	
		0(h0000) to 4294967295(hFFFFFFF)	0 0 9
		X, Y, F, Z, T, C, M, S, L, D, UW	
S2	DWORD	Data address to execute the subtraction operation with S1	
		0(h0000) to 4294967295(hFFFFFFF)	
		Y, F, Z, T, C, M, S, L, D, UW	
D	DWORD	Address to save the operation result	
		0(h0000) to 4294967295(hFFFFFFF)	
		X, Y, F, Z, T, C, M, S, L, D, UW, integer	
Ν	WORD	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	

<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.



5.5.126 Arithmetic Operation Instruction (MUL)



<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.



Aı oj in:	rithmetic peration struction	DMUL	S1	S2	D		Apr LP- LP-	olicable n S044, LF A070, LF	1odel ?-S07(?-A10₂), 4
OP	DATA type	Available dev	vice / Des	scriptio	on / Range	•				
		X, Y, F, Z, T, C	M, S, L,	D, UW,	integer		Erro	Carr Zero	Borr	Step
S1	DINT	Data address t	o execute	e the mu	Iltiplication	with S2			V0	
		-2147483648(80000001	0) to 21	47483647	(hFFFFFFFF)		\odot		7
		X, Y, F, Z, T, C	M, S, L,	D, UW,	integer					
S2	DINT	Data address t	o execute	e the mu	Itiplication	with S1				
		-2147483648(h80000000 to 2147483647(hFFFFFFF)								
		Y, F, Z, T, C, M								
D	QWORD	Address to say	e the ope	ration r	esult					

5.5.127 Arithmetic Operation Instruction (DMUL)

<Ladder>

X00000		1	1	
	DMUL	M0000	M0050	M0100
	-	1		
1		1	1	END
			·i	

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.



5.5.128 Arithmetic Operation Instruction (MULU)



<Ladder>

X00000	MIIII	мооо	M0050	M0100
	MOLO	MOOOO	M0030	- MOTOO

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.



5.5.129 Arithmetic Operation Instruction (DMULU)

A o in	rithmetic peration struction	DMULU S1 S2 D	App LP-	licab S044	le mo	odel S070	0,
OP	DATA type	Available device / Description / Range	LF -7		', ∟г-	7.10	7
		X, Y, F, Z, T, C, M, S, L, D, UW, integer	Erro	Zer	Car	Bon	Ste
S1	Data address to execute the multiplication with S2					row	0
		0(h0000) to 4294967295(hFFFFFFF)		\bigcirc	\bigcirc		7
		X, Y, F, Z, T, C, M, S, L, D, UW, integer	<u> </u>			<u> </u>	
S2	DWORD	Data address to execute the multiplication with S1					
		0(h0000) to 4294967295(hFFFFFFF)					
		Y, F, Z, T, C, M, S, L, D, UW					
D	QWORD	Address to save the operation result					

<Ladder>

X00000		1	I I	
-	DMULU	M0000	M0050	M0100
	T =	1		
				END
				-

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.



5.5.130 Arithmetic Operation Instruction (MULL)

Ar oj ins	ithmetic peration struction	MULL S1 S2 D N	App LP-	olicable model S044, LP-S070,
			LP-	A070, LP-A104
OP	DATA type	Available device / Description / Range]	
		X, Y, F, Z, T, C, M, S, L, D, UW, integer	Erro	Ste Bor Zer
S1	INT	Data address to execute the multiplication with S2	or	o y row
		-32768(h8000) to 32767(h7FFF)		○ ○ 9
		X, Y, F, Z, T, C, M, S, L, D, UW		
S2	INT	Data address to execute the multiplication with S1		
		-32768(h8000) to 32767(h7FFF)		
		Y, F, Z, T, C, M, S, L, D, UW		
D	DINT	Address to save the operation result		
		-2147483648(h80000000) to 2147483647(hFFFFFFF)		
		X, Y, F, Z, T, C, M, S, L, D, UW, integer		
Ν	WORD	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		

<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.



Ar or ins	ithmetic peration struction	DMULL	S1	S2	D	N		App	olicat	le m	odel	n
								LP-	A070), LP-	A104	3, 4
OP	DATA type	Available devi	ce / Des	scriptio	on / Ra	nge						
		X, Y, F, Z, T, C, I	M, S, L,	D, UW,	integer			Erro	Zerc	Carı	Borr	Step
S1	DINT	Data address to	execute	the mu	ultiplica	tion with S2	2	Ť	0	Ş	WO.	
		-2147483648(h8	3000000	0) to 21	47483	647(h7FFFl	FFF)		\bigcirc	\bigcirc		9
		X, Y, F, Z, T, C, I	M, S, L,	D, UW								
S2	DINT	Data address to	execute	e the mu	ultiplica	tion with S1						
		-2147483648(h8	3000000	0) to 21	474836	647(h7FFFl	FFF)					
		Y, F, Z, T, C, M,	S, L, D,	UW								
D	QINT	Address to save	the ope	ration r	esult							
		X, Y, F, Z, T, C, M, S, L, D, UW, integer										
Ν	WORD	The number of S2 data address and saved address to execute the operation with S1										
		In the range with	nin the c	orrespo	nding o	levice area	of S2 and D					

5.5.131 Arithmetic Operation Instruction (DMULL)

<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.



Ar or ins	ithmetic peration struction	MULLU S1 S2 D N	Applicable model LP-S044, LP-S070, LP-A070, LP-A104
OP	DATA type	Available device / Description / Range	
		X, Y, F, Z, T, C, M, S, L, D, UW, integer	Step Carr Zero
S1	WORD	Data address to execute the multiplication with S2	
		0(h0000) to 65535(hFFFF)	009
		X, Y, F, Z, T, C, M, S, L, D, UW	
S2	WORD	Data address to execute the multiplication with S1	l
		0(h0000) to 65535(hFFFF)	l
		Y, F, Z, T, C, M, S, L, D, UW	
D	DWORD	Address to save the operation result	
		0(h0000) to 4294967295(hFFFFFFF)	l
		X, Y, F, Z, T, C, M, S, L, D, UW, integer	
Ν	WORD	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	l

5.5.132 Arithmetic Operation Instruction (MULLU)

<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.



5.5.133 Arithmetic Operation Instruction (DMULLU)

Ar or ins	ithmetic peration struction	DMULLU S1 S2 D N	Apı LP-	olicat -S044	ole me 1, LP-	odel -S07	0,	
OP	DATA type	Available device / Description / Range	LP-	-A07(), LP-	-A10	4	
•	Drancypo		Ē		0	Ψ	Ś	
		A, T, F, Z, T, C, W, S, L, D, OW, Integer	rror	ero	arry	orro	tep	
S1	DWORD	Data address to execute the multiplication with S2				ž		
		0(h0000) to 4294967295(hFFFFFFF)		\bigcirc	\bigcirc		9	
		X, Y, F, Z, T, C, M, S, L, D, UW						
S2	DWORD	Data address to execute the multiplication with S1						
		0(h0000) to 4294967295(hFFFFFFF)						
		Y, F, Z, T, C, M, S, L, D, UW						
D	QWORD	Address to save the operation result						
		X, Y, F, Z, T, C, M, S, L, D, UW, integer						
Ν	WORD	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						

<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.



5.5.134 Arithmetic Operation Instruction (DIV)



<Ladder>



 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.
 Executes the Signed operation.

3. If the divisor is 0, error flag is SET.

4. If the dividend is 0, zero flag is SET.



Arithmetic operation DDIV **S1 S2** D Applicable model instruction LP-S044, LP-S070, LP-A070, LP-A104 OP DATA type Available device / Description / Range Step Error X, Y, F, Z, T, C, M, S, L, D, UW, integer Lero Jorrow Carry Data address to execute the division operation with S2 **S1** DINT -2147483648(h80000000) to 2147483647(hFFFFFFF) \bigcirc X, Y, F, Z, T, C, M, S, L, D, UW, integer Data address to execute the division operation with S1 **S2** DINT -2147483648(h80000000) to 2147483647(hFFFFFFF) Y, F, Z, T, C, M, S, L, D, UW D DINT Address to save the operation result -2147483648(h80000000) to 2147483647(hFFFFFFF)

5.5.135 Arithmetic Operation Instruction (DDIV)

<Ladder>

X00000	DDIV	M0000	M0050	D0100
				END

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.



5.5.136 Arithmetic Operation Instruction (DIVU)



<Ladder>

X00000				
	DIVU	M0000	M0050	D0100
				END
÷				· -

 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.
 Executes the Unsigned operation.

3. If the divisor is 0, error flag is SET.

4. If the dividend is 0, zero flag is SET.



5.5.137 Arithmetic Operation Instruction (DDIVU)

Ar oj ins	ithmetic oeration struction	DDIVU	S1	S2	D		Aj LF LF	oplica P-S04 P-A07	able m 14, LP 70, LP	odel -S07(-A10 [,]	D, 4
OP	DATA type	Available dev	ice / Des	scriptio	n / Range						
		X, Y, F, Z, T, C,	M, S, L,	D, UW,	integer		Erro	Zero	Car	Bon	Step
S1	DWORD	Data address to	o execute	e the div	ision opera	tion with S2			Ŋ	row	0
		0(h0000) to 429	9496729	5(hFFFF	FFFF)		O	\odot			7
		X, Y, F, Z, T, C,	M, S, L,	D, UW,	integer						
S2	DWORD	Data address to	o execute	e the div	ision opera	tion with S1					
		0(h0000) to 429	9496729	5(hFFFF	FFFF)						
		Y, F, Z, T, C, M,	S, L, D,	UW							
D	DWORD	Address to save	e the ope	eration r	esult						
		0(h0000) to 429	9496729	5(hFFFF	FFFF)						

<Ladder>

X00000	DDIVU	M0000	M0050	D0100
				END

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.



5.5.138 Arithmetic Operation Instruction (DIVL)

Ar oj ins	ithmetic peration struction	DIVL S1 S2 D N		Арр	licab	le mo	odel	2
				LP-	5044	, LP-	5070	0,
				LP-/	A070	, LP-	A104	4
OP	DATA type	Available device / Description / Range						
		X, Y, F, Z, T, C, M, S, L, D, UW, integer		Erro	Zer	Car	Bor	Ste
S1	INT	Data address to execute the division operation with S2		Ŷ	0	Ŷ	row	σ
		-32768(h8000) to 32767(h7FFF)		\bigcirc	\bigcirc			9
		X, Y, F, Z, T, C, M, S, L, D, UW						
S2	INT	Data address to execute the division operation with S1						
		-32768(h8000) to 32767(h7FFF)						
		Y, F, Z, T, C, M, S, L, D, UW						
D	INT	Address to save the operation result						
		-32768(h8000) to 32767(h7FFF)						
		X, Y, F, Z, T, C, M, S, L, D, UW, integer						
Ν	WORD	The number of S2 data address and saved address to execute operation with S1	the					
		In the range within the corresponding device area of S2 and D						

<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.





Aı o in:	rithmetic peration struction	DDIVL S1 S2 D N	App	olical	ble m	odel	
			LP-	-S044	4, LP	-S07	0,
			LP-	-A07	0, LP	-A10	4
OP	DATA type	Available device / Description / Range					
		X, Y, F, Z, T, C, M, S, L, D, UW, integer	Erro	Zer	Car	Bor	Ste
S1	DINT	Data address to execute the division operation with S2	or	0	Ϋ́	row	q
		-2147483648(h80000000) to 2147483647(hFFFFFFF)	\bigcirc	\bigcirc			9
		X, Y, F, Z, T, C, M, S, L, D, UW					
S2	DINT	Data address to execute the division operation with S1					
		-2147483648(h80000000) to 2147483647(hFFFFFFF)					
		Y, F, Z, T, C, M, S, L, D, UW					
D	DINT	Address to save the operation result					
		-2147483648(h80000000) to 2147483647(hFFFFFFF)					
		X, Y, F, Z, T, C, M, S, L, D, UW, integer					
Ν	WORD	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					

5.5.139 Arithmetic Operation Instruction (DDIVL)

<Ladder>





5.5.140 Arithmetic Operation Instruction (DIVLU)

Ar or ins	ithmetic peration struction	DIVLU S1 S2 D N	Apr LP-	olical S04	ole m 1, LP·	odel -S07(0,
			LP-	A07), LP·	-A104	4
OP	DATA type	Available device / Description / Range					
		X, Y, F, Z, T, C, M, S, L, D, UW, integer	Erro	Zero	Car	Bor	Ste
S1	WORD	Data address to execute the division operation with S2	or	0	Ŋ	row	0
		0(h0000) to 65535(hFFFF)	\odot	\bigcirc			9
		X, Y, F, Z, T, C, M, S, L, D, UW					
S2	WORD	Data address to execute the division operation with S1					
		0(h0000) to 65535(hFFFF)					
		Y, F, Z, T, C, M, S, L, D, UW					
D	WORD	Address to save the operation result					
		0(h0000) to 65535(hFFFF)					
		X, Y, F, Z, T, C, M, S, L, D, UW, integer					
Ν	WORD	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					

<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.





5.5.141 Arithmetic Operation Instruction (DDIVLU)

A o in	rithmetic peration struction	DDIVLU S1 S2 D N	Apr LP-	olicat S044	ole m 1, LP [.]	odel -S07	0,
		1	LP-	A070), LP	A10	4
OP	DATA type	Available device / Description / Range					
		X, Y, F, Z, T, C, M, S, L, D, UW, integer	Erro	Zer	Car	Bor	Ste
S1	DWORD	Data address to execute the division operation with S2	or	0	Ŷ	row	σ
		0(h0000) to 4294967295(hFFFFFFF)	\bigcirc	\bigcirc			9
		X, Y, F, Z, T, C, M, S, L, D, UW					
S2	DWORD	Data address to execute the division operation with S1					
		0(h0000) to 4294967295(hFFFFFFF)					
		Y, F, Z, T, C, M, S, L, D, UW					
D	DWORD	Address to save the operation result					
		0(h0000) to 4294967295(hFFFFFFF)					
		X, Y, F, Z, T, C, M, S, L, D, UW, integer					
Ν	WORD	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					

<Ladder>





E

5.5.142 Arithmetic Operation Instruction (INC)

Ari op ins	ithmetic peration struction	INC	D		Арр	licat	ole m	odel	
					LP-S	S044	I, LP∙	-S07	0,
					LP-/	4070), LP·	-A10	4
OP	DATA type	Available d	evice / Description / R	ange					
		Y, F, Z, T, C,	M, S, L, D, UW		Erro	Zer	Car	Bori	Stel
D	WORD	Data address	s to execute the operatio	n	y	0	γ	row	σ
		0(h0000) to 6	65535(hFFFF)			\bigcirc	\bigcirc		3

<Ladder>

X00000				
- I I		-	INC	D0000
	T		1	
			1	END
				r

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.

D(Destination) word D(Destination) word		D(Destination) word
H3456 +1 H3457	$\xrightarrow{+1}$	H3456

r-

5.5.143 Arithmetic Operation Instruction (DINC)

Ari op ins	ithmetic peration struction	DINC	D	Арр	licat	ole m	odel	
				LP-	S044	I, LP	-S07	΄Ο,
				LP-/	4070), LP	-A10	4
ΟΡ	DATA type	Available devi	ice / Description / Range					
		Y, F, Z, T, C, M,	S, L, D, UW	Erro	Zer	Car	Bori	Ste
D	DWORD	Data address to	execute the operation	9r	0	Ŋ	row	
		0(h0000) to 429	94967295(hFFFFFFF)		\bigcirc	\bigcirc		3

<Ladder>

X00000			DINC	D0000
		, ,		
	 	 	1	END

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.

D(Destination) double word D(Destination) double word +1	+1	D(Destination) double word
H34561245 H34561246	\longrightarrow	H34561245

5.5.144 Arithmetic Operation Instruction (DEC)

Aı o in	rithmetic peration struction	DEC	D	Арр	olicat	ole m	odel	
				LP-	S044	I, LP	-S07	0,
				LP-	A070), LP	-A10	4
OP	DATA type	Available d	evice / Description / Range					
		Y, F, Z, T, C,	M, S, L, D, UW	Erro	Zero	Car	Bori	Step
D	WORD	Data addres	s to execute the operation	Ÿ	0	Ż	WO.	0
		0(h0000) to 6	65535(hFFFF)		\bigcirc		\bigcirc	3
	•	•		<u> </u>			I	

<Ladder>

Г

		DEC D0000	 Decreases the value of destination word D by '1'. If D value is '0', zero flag is SET. If D value is decreased again from '0', borrow flag is SET.
--	--	-----------	--

D(Dest	ination) word		D(Destination) word
	H3A56	$\xrightarrow{-1}$	H3A55

r

5.5.145 Arithmetic Operation Instruction (DDEC)

	Ari op Ins	ithmetic peration struction	DDEC	D	Арр	licab	ole m	odel	
					LP-	S044	I, LP-	-S07(0,
					LP-/	A070), LP-	-A10	4
	ОР	DATA type	Available devi	ce / Description / Range					
			Y, F, Z, T, C, M,	S, L, D, UW	Erro	Zer	Car	Bor	Ste
1	D	DWORD	Data address to	execute the operation)r	0	Ŋ	ſOW	
1			0(h0000) to 429	94967295(hFFFFFFFF)		\bigcirc		\bigcirc	3

<Ladder>

X00000	DDEC	D0000

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.



5.5.146 Arithmetic Operation Instruction (ADDB)



<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.



5.5.147 Arithmetic Operation Instruction (DADDB)

Ar or ins	Arithmetic operation DADDB S1 S2 D instruction							Applicable model LP-S044, LP-S070, LP-A070, LP-A104						
OP	DATA type	Available device / D	escriptio	n / Range				,						
		X, Y, F, Z, T, C, M, S,	/, F, Z, T, C, M, S, L, D, UW, integer											
S1	DWORD	Data address to exec	ata address to execute the BCD addition operation with S2							σ				
		h00000000 to h99999	0000000 to h99999999							7				
		X, Y, F, Z, T, C, M, S,	, Y, F, Z, T, C, M, S, L, D, UW, integer											
S2	DWORD	Data address to exec	ata address to execute the BCD addition operation with S1											
		h00000000 to h99999												
		Y, F, Z, T, C, M, S, L, I	, F, Z, T, C, M, S, L, D, UW											
D	DWORD	ORD Address to save the operation result												
		h00000000 to h99999	0000000 to h99999999											

<Ladder>



 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.
 If any of the value not composed of the BCD code is detected in S1 and S2, error flag is SET.

(Except 0 to 9999999)

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.



5.5.148 Arithmetic Operation Instruction (ADDBL)

Ar or ins	Arithmetic operation ADDBL S1 S2 D N instruction OP DATA type Available device / Description / Range								Applicable model LP-S044, LP-S070, LP-A070, LP-A104							
OP	DATA type	Available devic	e / Des	scriptio	n / Ra	nge										
		X, Y, F, Z, T, C, N	/, F, Z, T, C, M, S, L, D, UW, integer									Ste				
S1	WORD	Data address to e	ta address to execute the BCD addition operation with S2								row	σ				
		h0000 to h9999	0000 to h9999									9				
		X, Y, F, Z, T, C, N	, Y, F, Z, T, C, M, S, L, D, UW													
S2	WORD	Data address to e	xecute	the BCD	additio	n operatior	n with S1									
		h0000 to h9999														
		Y, F, Z, T, C, M, S,	L, D, U	W												
D	WORD	Address to save t	he oper	ation res	sult											
		h0000 to h9999														
		X, Y, F, Z, T, C, N	I, S, L,	D, UW,	integer											
Ν	WORD	The number of S2 operation with S1	data a	ddress a	nd save	ed address	to execute the									
		In the range within	n the co	rrespond	ding dev	/ice area of	S2 and D									

<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.



5.5.149 Arithmetic Operation Instruction (DADDBL)

Ar or ins	ithmetic peration struction	DADDBL S1 S2 D N	Apr LP-	olicab S044	le mo	odel S07	0,
			LP-	A070), LP-	A10	4
ОР	DATA type	Available device / Description / Range					
		X, Y, F, Z, T, C, M, S, L, D, UW, integer	Erro	Zer	Car	Bor	Ste
S1	DWORD	Data address to execute the BCD addition operation with S2	0r	0	Ϋ́	row	σ
		h00000000 to h99999999	\bigcirc	\bigcirc	\bigcirc		9
		X, Y, F, Z, T, C, M, S, L, D, UW					
S2	DWORD	Data address to execute the BCD addition operation with S1					
		h00000000 to h99999999					
		Y, F, Z, T, C, M, S, L, D, UW					
D	DWORD	Address to save the operation result					
		h00000000 to h99999999					
		X, Y, F, Z, T, C, M, S, L, D, UW, integer					
Ν	WORD	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					

<Ladder>

X00000			1	1	1
- F	DADDBL	M0000	M0050	D0000	3
	1				
	1		1	1	END
	T		T	T	Τ-

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.

		liag is -	SET.		
	Double word S1(Source1) 0~99999999	Double word S2(Source2) 0~99999999	Double wo D(Destinati 0~999999	ord ion) 99	
(51)		(S2) (S2)+1 (S2)+2 (S2)+3 (S2)+((N) -1)		(D) (D)+1 (D)+2 (D)+3 (D)+((N) -1)	

Step

Arithmetic operation SUBB **S1 S2** D Applicable model instruction LP-S044, LP-S070, LP-A070, LP-A104 OP DATA type Available device / Description / Range Error ∠ero Carry X, Y, F, Z, T, C, M, S, L, D, UW, integer Borrow Data address to execute the BCD subtraction operation with S2 **S1** WORD h0000 to h9999 \bigcirc X, Y, F, Z, T, C, M, S, L, D, UW, integer Data address to execute the BCD subtraction operation with S1 **S2** WORD h0000 to h9999 Y, F, Z, T, C, M, S, L, D, UW D WORD Address to save the operation result h0000 to h9999

5.5.150 Arithmetic Operation Instruction (SUBB)

<Ladder>

	1	1 1	
SUBB	M0000	M0050	D0100
	1		END
	SUBB	SUBB M0000	SUBB M0000 M0050

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.



5.5.151 Arithmetic Operation Instruction (DSUBB)

Ar op ins	ithmetic peration struction	DSUBB	S1	S2	D		App LP-3 LP-7	licab S044 A070	le mo ⊦, LP-), LP-	odel -S07(-A104	0, 4
OP	DATA type	Available devic	e / Des	criptio	n / Range						
		X, Y, F, Z, T, C, N	1, S, L, I	Errc	Zero	Car	Bori	Step			
S1	DWORD Data address to execute the BCD subtraction operation with S2							0	Ŋ	row	0
		h00000000 to h99999999								\bigcirc	7
		X, Y, F, Z, T, C, N	, Y, F, Z, T, C, M, S, L, D, UW, integer								
S2	DWORD	Data address to	execute	the BC	D subtraction	operation with S1					
		h00000000 to h	9999999	9							
		Y, F, Z, T, C, M, S	6, L, D, I	JW							
D	DWORD	Address to save	the ope	ration re	esult						
		h00000000 to h	9999999	9							

<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.





5.5.152 Arithmetic Operation Instruction (SUBBL)

Ar oj ins	ithmetic peration struction	SUBBL S1 S2 D N	Apr LP-	olicat	ole m 1, LP	odel -S07(0,
OP	DATA type	Available device / Description / Range	LP-	-AU71	J, LP∙	-A104	4
S 1	WORD	X, Y, F, Z, T, C, M, S, L, D, UW, integer Data address to execute the BCD subtraction operation with S2	Error	Zero	Carry	Borrow	Step
S2	WORD	h0000 to h9999 X, Y, F, Z, T, C, M, S, L, D, UW Data address to execute the BCD subtraction operation with S1 h0000 to h9999	O	O		0	9
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					

<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 and 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.



5.5.153 Arithmetic Operation Instruction (DSUBBL)

Aı o in	ithmetic peration struction	DSUBBL S1	S 2	D	Ν		App	olicab S044	le mo	odel S070	0.
										A104	2, 4
OP	DATA type	Available device / Desc	riptio	n / Rar	nge] _, ,		,		-
	51	X, Y, F, Z, T, C, M, S, L, D,	UW, i	nteger			Ē	Zer	Ca	Bo	Ste
S1	DWORD	Data address to execute th	ata address to execute the BCD subtraction operation with S2								ğ
		h000000000 to h99999999)0000000 to h99999999								9
		X, Y, F, Z, T, C, M, S, L, D,	UW								
S2	DWORD	Data address to execute the	ne BCI) subtr	action o	peration with S1					
		h00000000 to h99999999									
		Y, F, Z, T, C, M, S, L, D, U\	Ν								
D	DWORD	Address to save the opera	tion re	sult							
		h00000000 to h99999999									
		X, Y, F, Z, T, C, M, S, L, D,	UW, i	nteger							
Ν	WORD	The number of S2 data ad operation with S1	ress to execute the								
		In the range within the cor	ea of S2 and D]							

<Ladder>



(51)	(S2)	\longrightarrow	(D)	
	(\$2)+1	\longrightarrow	(D)+1	
	(S2)+2	\longrightarrow	(D)+2	
	(S2)+3	\longrightarrow	(D)+3	
	1	:	:	
	(S2)+((N) -1)	\longrightarrow	(D)+((N) -1)	

5.5.154 Arithmetic Operation Instruction (MULB)



<Ladder>

X00000	MULB	M0000	M0050	D0100
				END

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.



5.5.155 Arithmetic Operation Instruction (DMULB)

Ar oj ins	ithmetic peration struction	DMULB S1 S2 D	Apr LP-	olicat S044	ole m	odel S07	0,
OP	DATA type	Available device / Description / Range	_ LP-	AU71), LP·	A104	4
		X, Y, F, Z, T, C, M, S, L, D, UW, integer	Erro	Zer	Car	Bor	Ste
S1	DWORD	Data address to execute the BCD multiplication with S2	Ÿ	0	Ϋ́	row	σ
		h00000000 to h99999999	\bigcirc	\bigcirc	\bigcirc		7
		X, Y, F, Z, T, C, M, S, L, D, UW, integer					
S2	DWORD	Data address to execute the BCD multiplication with S1					
		h00000000 to h99999999					
		Y, F, Z, T, C, M, S, L, D, UW					
D	QWORD	Address to save the operation result					

<Ladder>

×00000	DMULB	M0000	M0050	D0100
		- - - - -	-	END

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.



5.5.156 Arithmetic Operation Instruction (MULBL)

Ar or ins	ithmetic peration struction	MULBL	S 1	S2	D	N		Арр	olicab	le mo	odel	
									S044	, LP-	S070),
								LP-	A070	, LP-	A104	1
OP	DATA type	Available device	/ Des	criptio	n / Rar	nge						
		X, Y, F, Z, T, C, M,	S, L, I	D, UW, i	nteger			Erro	Zer	Car	Bor	Ste
S1	WORD	Data address to ex	ecute	the BCI	D multi	plicatior	with S2	9r	0	Ϋ́	row	σ
		h0000 to h9999	000 to h9999							\bigcirc		9
		X, Y, F, Z, T, C, M,	S, L, I	D, UW								
S2	WORD	Data address to ex	cecute	the BCI	D multi	plicatior	n with S1					
		h0000 to h9999										
		Y, F, Z, T, C, M, S,	L, D, l	JW								
D	WORD	Address to save th	e ope	ration re	sult							
		h00000000 to h999	99999	9								
		X, Y, F, Z, T, C, M,	S, L, I	D, UW, i	nteger							
Ν	WORD	The number of S2 data address and saved address to execute the operation with S1										
		In the range within	the co	orrespor	nding d	evice ar	ea of S2 and D					

<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.



5.5.157 Arithmetic Operation Instruction (DMULBL)

Ar or ins	ithmetic peration struction	DMULBL S1 S2 D N	Apr LP-	olicat S044	ble m 1, LP-	odel -S07	0,
OP	DATA type	Available device / Description / Range		AUT	יד, ברי	-A 10-	+
S1	DWORD	X, Y, F, Z, T, C, M, S, L, D, UW, integer Data address to execute the BCD multiplication with S2	Error	Zero	Carry	Borrow	Step
		h00000000 to h99999999	\bigcirc	\bigcirc	\odot		9
		X, Y, F, Z, T, C, M, S, L, D, UW					
S2	DWORD	Data address to execute the BCD multiplication with S1					
		h00000000 to h99999999					
		Y, F, Z, T, C, M, S, L, D, UW					
D	QWORD	Address to save the operation result					
		X, Y, F, Z, T, C, M, S, L, D, UW, integer					
Ν	WORD	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					

<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.





5.5.158 Arithmetic Operation Instruction (DIVB)

	Ari op ins	thmetic peration truction	DIVB	S1	S2	D		App LP-\$ LP-/	licab 5044 4070	le mo , LP-), LP-	odel ∙S07(∙A10 [,]	0, 4
	OP	DATA type	Available dev	vice / Des	criptio	n / Range						
ſ			X, Y, F, Z, T, C	, M, S, L, I	D, UW, i	nteger		Erro	Zer	Car	Bori	Stel
	S1	WORD	Data address	ata address to execute the BCD division operation with S2						Ŋ	row	σ
			h0000 to h999	9				\bigcirc	\bigcirc			7
ſ			X, Y, F, Z, T, C	, M, S, L, I	D, UW, i	nteger						
	S2	WORD	Data address	to execute	the BC	D division operatio	n with S1					
			h0000 to h999	9								
			Y, F, Z, T, C, N	I, S, L, D, l	JW							
	D	WORD	Address to sav	ve the ope	ration re	esult						
	h0000 to h9999											
L		1	1									

<Ladder>

X00000				
	DIVB	M0000	M0050	D0100
-				
				END

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.



5.5.159 Arithmetic Operation Instruction (DDIVB)

	Ari op ins	ithmetic peration struction	DDIVB	S1	S2	D		App LP-:	licab S044 A070	le mo , LP-	odel ∙S07(∙A10/	0,
(OP	DATA type	Available dev	ice / Des	criptio	n / Range				,	-	
			X, Y, F, Z, T, C,	M, S, L, [D, UW, i	nteger		Erro	Zer	Car	Bori	Stel
	S1	DWORD	Data address to	Data address to execute the BCD division operation with S2						Ż	row	σ
			h00000000 to h	199999999	9			\bigcirc	\bigcirc			7
			X, Y, F, Z, T, C,	M, S, L, I	D, UW, i	nteger						
	S2	DWORD	Data address to	o execute	the BC	D division ope	eration with S1					
			h00000000 to h	199999999	9							
			Y, F, Z, T, C, M, S, L, D, UW									
	D	DWORD	Address to sav	e the ope	ration re	esult						
	h00000000 to h99999999											

<Ladder>

X00000	1	1 1		
	DDIVB	M0000	M0050	D0100
	1 1 1 1			
				L Ŋ.

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.



Arithmetic operation instruction		DIVBL S1 S2 D N	App LP	olicat S044 A07(ole m 4, LP 0, LP	odel -S07 -A10	0, 4
OP	DATA type	Available device / Description / Range					
S1	WORD	X, Y, F, Z, T, C, M, S, L, D, UW, integer	Erro	Zero	Carı	Borr	Step
		Data address to execute the BCD division operation with S2) Ÿ		2	MO.	
		h0000 to h9999	\bigcirc	\odot			9
S2	WORD	X, Y, F, Z, T, C, M, S, L, D, UW					L1
		Data address to execute the BCD division operation with S1					
		h0000 to h9999					
	WORD	Y, F, Z, T, C, M, S, L, D, UW					
D		Address to save the operation result					
		h0000 to h9999					
	WORD	X, Y, F, Z, T, C, M, S, L, D, UW, integer					
N		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					

5.5.160 Arithmetic Operation Instruction (DIVBL)

<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.




5.5.161 Arithmetic Operation Instruction (DDIVBL)

Aı o in	Arithmetic operation DDIVBL S1 S2 D N instruction				Applicable model LP-S044, LP-S070,					
), LP-	A10	4		
OP	DATA type	Available device / Description / Range								
		X, Y, F, Z, T, C, M, S, L, D, UW, integer		Erro	Zer	Car	Bori	Stel		
S1	DWORD	Data address to execute the BCD divisior	operation with S2	or	0	γ	row	σ		
		h00000000 to h99999999	\bigcirc	\bigcirc			9			
		X, Y, F, Z, T, C, M, S, L, D, UW								
S2	DWORD	Data address to execute the BCD division operation with S1								
		h00000000 to h99999999								
		Y, F, Z, T, C, M, S, L, D, UW								
D	DWORD	Address to save the operation result								
		h00000000 to h99999999								
		X, Y, F, Z, T, C, M, S, L, D, UW, integer								
Ν	N WORD The number of S2 data address and saved address to execute the operation with S1									
		In the range within the corresponding dev	ice area of S2 and D							

<Ladder>







5.5.162 Arithmetic Operation Instruction (INCB)

	LP-S044, LP-S070, LP-A070, LP-A104
	LP-A070, LP-A104
OP DATA type Available device / Description / Range	
Y, F, Z, T, C, M, S, L, D, UW	Ster Car Zero
D WORD BCD data address to execute the operation	
h0000 to h9999	

<Ladder>

X00000	 Increases the word value of D composed of BCD code by 1 as BCD code. If the word value of D is not the BCD code, error flag is SET.
END	 If the increased result is 0(BCD), zero flag is SET. If the result value is out of the D word range, carry flag is SET.

D(Destination) word		D(Destination) word
3456	$ \xrightarrow{+1} >$	3457
BCD		BCD

F

5.5.163 Arithmetic Operation Instruction (DINCB)

Ar op ins	ithmetic peration struction	DINCB	D	Арр	olicat	ole m	odel	
				LP-	S044	I, LP	-S07	'0,
				LP-	A070), LP	-A10)4
OP	DATA type	Available devic	ce / Description / Range					
		Y, F, Z, T, C, M, S	S, L, D, UW	Errc	Zero	Car	Bori	Step
D	DWORD	BCD data addres	ss to execute the operation	Уr	0	Ŋ	νογ	
		h00000000 to h9	9999999	\bigcirc	\bigcirc	\bigcirc		3

<Ladder>

Г

X00000 DINCB M0000 END	 Increases the double word value of D composed of BCD code by 1 as BCD code. If the double word value of D is not the BCD code, error flag is SET. If the increased result is 0(BCD), zero flag is SET. If the result value is out of the D double word range, carry flag is SET.
------------------------------	---

D(Destination) double word	.1	D(Destination) double word
34561245	\longrightarrow	34561246
BCD		BCD

5.5.164 Arithmetic Operation Instruction (DECB)

Aı o in	rithmetic peration struction	DECB	D	A	pplica	ble m	odel	
				LI	2-S04	4, LP	-S07	0,
				LI	2-A07	0, LP	-A10	4
OP	DATA type	Available de	vice / Description / Range					
		Y, F, Z, T, C, N	<i>I</i> , S, L, D, UW		Zero	Car	Bori	Step
D	WORD	BCD data add	lress to execute the operation			2	, OM	
		h0000 to h99§	99	C)		\bigcirc	3

<Ladder>

r

X00000 1DECB END	 Decreases the word value of D composed of BCD code by 1 as BCD code. If the word value of D is not the BCD code, error flag is SET. If the decreased result is 0(BCD), zero flag is SET. If the result value is out of D word range, borrow flag is SET.
------------------------	---

D(Destination) word		D(Destination) word
3556	$\xrightarrow{-1}$	3555

F

5.5.165 Arithmetic Operation Instruction (DDECB)

Ar op ins	ithmetic peration struction	DDECB	D	Арр	olicat	ole m	odel	
		LP-S044, LP-S070,						
				LP-	A070), LP	-A10)4
OP	DATA type	Available devic	e / Description / Range					
		Y, F, Z, T, C, M, S	S, L, D, UW	Erro	Zero	Car	Bon	Step
D	DWORD	BCD data addres	s to execute the operation)r		Ŋ	ΟW	
		h00000000 to h9	9999999	\bigcirc	\bigcirc		\bigcirc	3

<Ladder>

×00000	1. Decreases the double word of D composed of BCD code by 1 as BCD code.
DDECB M0000	2. If the double word value of D is not BCD code, error flag is SET.
	 If the decreased result is 0(BCD), zero flag is SET. If the result value is out of the D double word range, borrow flag is SET.

-1	stination) double word	D(Destination) double word
34301243	34561245	34561244

5.5.166 Logical Operation Instruction (WAND)



<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.



5.5.167 Logical Operation Instruction (DAND)

l oj ins	Logical peration struction	DAND S1 S2 D	Applicable model LP-S044, LP-S070,
OP	DATA type	Available device / Description / Range	LP-A070, LP-A104
-		X, Y, F, Z, T, C, M, S, L, D, UW, integer	
S1	DWORD	Data address to execute the '&' operation v	
		0(h0000) to 4294967295(hFFFFFFFF)	
		X, Y, F, Z, T, C, M, S, L, D, UW, integer	
S2	DWORD	Data address to execute the '&' operation v	vith S1
		0(h0000) to 4294967295(hFFFFFFFF)	
		Y, F, Z, T, C, M, S, L, D, UW	
D	DWORD	Address to save the operation result	
		0(h0000) to 4294967295(hFFFFFFFF)	

<Ladder>

X00000	DAND	M0000	M0050	D0000
				END

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.



5.5.168 Logical Operation Instruction (AAND)

OP DATA type Available device / Description / Range S1 BIT X, Y, F, T, C, M, UB Image: Comparison of the bit device to execute the '&' operation with S2 Not applicable Not applicable Image: Comparison of the bit device to execute the '&' operation with S1 S2 BIT Start address of the bit device to execute the '&' operation with S1 Not applicable X, Y, F, T, C, M, UB D BIT Start address of the bit device to store the operation result Not applicable Y, F, T, C, M, UB D BIT Start address of the bit device to store the operation result Not applicable 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	L op ins	Logical operation AAND S1 S2 D N instruction							Applicable model LP-S044, LP-S070, LP-A070, LP-A104					
S1 BIT X, Y, F, T, C, M, UB Start address of the bit device to execute the '&' operation with S2 Imode Signature Not applicable X, Y, F, T, C, M, UB S2 BIT X, Y, F, T, C, M, UB S1 BIT Start address of the bit device to execute the '&' operation with S1 Not applicable X, Y, F, T, C, M, UB S1 BIT S1 Start address of the bit device to execute the '&' operation with S1 Not applicable Y, F, T, C, M, UB S1 Start address of the bit device to store the operation result Not applicable 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	OP	DATA type	Available devic	e / Des	criptio	n / Ra	nge							
S1 BIT Start address of the bit device to execute the '&' operation with S2 Image: Color of the security operation with S2 S1 BIT Start address of the bit device to execute the '&' operation with S1 S2 BIT Start address of the bit device to execute the '&' operation with S1 Not applicable Y, F, T, C, M, UB D BIT Start address of the bit device to store the operation result Not applicable Y, F, T, C, M, UB D BIT Start address of the bit device to store the operation result Not applicable 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			X, Y, F, T, C, M, L	В					Erro	Zer	Car	Bor	Stel	
Not applicable Image: Constraint of the start address of the bit device to execute the '&' operation with S1 S2 BIT Start address of the bit device to execute the '&' operation with S1 Not applicable Y, F, T, C, M, UB D BIT Start address of the bit device to store the operation result Not applicable Y, F, T, C, M, UB D BIT Start address of the bit device to store the operation result Not applicable 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	S1	віт	Start address of t	he bit d	evice to	execu	te the '&	operation with S2	or	0	Ŋ	row	0	
S2 BIT X, Y, F, T, C, M, UB Start address of the bit device to execute the '&' operation with S1 Not applicable Y, F, T, C, M, UB BIT Start address of the bit device to store the operation result Not applicable 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			Not applicable							\bigcirc			9	
S2 BIT 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		віт	X, Y, F, T, C, M, L	В										
Not applicable P F, T, C, M, UB Start address of the bit device to store the operation result Not applicable 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	S2		Start address of t	he bit d	evice to	execu	te the '&	operation with S1						
D BIT Y, F, T, C, M, UB Start address of the bit device to store the operation result Not applicable 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			Not applicable											
D BIT Start address of the bit device to store the operation result Not applicable 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			Y, F, T, C, M, UB											
Not applicable 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	D	BIT	Start address of t	he bit d	evice to	store	the opera	ation result						
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			Not applicable											
The number of bit device to execute the operation including the start address			X, Y, F, Z, T, C, M	, S, L, I	D, UW, i	nteger								
	N	WORD	The number of bi start address	t device	to exe	cute the	e operati	on including the						
As many as the number of devices remained in the corresponding S1, S2, and D area			As many as the n S1, S2, and D are	umber ea	of devic	es rem	ained in	the corresponding						

<Ladder>

X00000		1		1	
-	AAND	M00000	M00100	M01000	D0000
		1		1	END
· · · · · · · · · · · · · · · · · · ·					I

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.



5.5.169 Logical Operation Instruction (WANDL)

ا op ins	Logical peration struction	WANDL S1 S2 D N	App LP-	blicable model S044, LP-S070,
	DATA turna	Available device / Description / Benze	LP-	A070, LP-A104
UP	DATA type	Available device / Description / Range	Π	ത്രത്ര
		X, Y, F, Z, I, C, M, S, L, D, UW, Integer	rror	orro arry
S1	WORD	Data address to execute the '&' operation with S2		Ň
		0(h0000) to 65535(hFFFF)		© 9
		X, Y, F, Z, T, C, M, S, L, D, UW		
S2	WORD	Data address to execute the '&' operation with S1		
		0(h0000) to 65535(hFFFF)		
		Y, F, Z, T, C, M, S, L, D, UW		
D	WORD	Address to save the operation result		
		0(h0000) to 65535(hFFFF)		
		X, Y, F, Z, T, C, M, S, L, D, UW, integer		
N	WORD	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		

<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.

÷

(D)+((N) -1)

2. If the result value is '0' word, zero flag is SET.



:

(S2)+((N) -1)

5.5.170 Logical Operation Instruction (DANDL)

l or ins	Logical peration struction	DANDL S1 S2 D N	Applicable model LP-S044, LP-S070, LP-A070, LP-A104
OP	DATA type	Available device / Description / Range	
		X, Y, F, Z, T, C, M, S, L, D, UW, integer	Ster Car Zero
S1	DWORD	Data address to execute the '&' operation with S2	
		0(h0000) to 4294967295(hFFFFFFF)	◎ 9
	DWORD	X, Y, F, Z, T, C, M, S, L, D, UW	
S2		Data address to execute the '&' operation with S1	
		0(h0000) to 4294967295(hFFFFFFF)	
		Y, F, Z, T, C, M, S, L, D, UW	
D	DWORD	Address to save the operation result	
		0(h0000) to 4294967295(hFFFFFFF)	
	WORD	X, Y, F, Z, T, C, M, S, L, D, UW, integer	
Ν		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	

<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.



(S1)		(S2)	\longrightarrow	(D)
		(S2)+1	\longrightarrow	(D)+1
		(S2)+2	\longrightarrow	(D)+2
		(S2)+3	\longrightarrow	(D)+3
	:	:	:	:
		(S2) + ((N) 1)		(D) + ((N) 1)
		(32)+((14) -1)	\rightarrow	(D)+((N)-1)

5.5.171 Logical Operation Instruction (WOR)



<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.





5.5.172 Logical Operation Instruction (DOR)



<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.



5.5.173 Logical Operation Instruction (AOR)

L or ins	Logical peration struction	AOR S1 S2 D N	Applicable model LP-S044, LP-S070, LP-A070, LP-A104
OP	DATA type	Available device / Description / Range	
		X, Y, F, T, C, M, UB	Ster Car Zer
S1	віт	Data address to execute the 'OR' operation with S2	
		Not applicable	□ 9
		X, Y, F, T, C, M, UB	
S2	BIT	Data address to execute the 'OR' operation with S1	
		Not applicable	
		Y, F, T, C, M, UB	
D	BIT	Start address of the bit device to save the operation result	
		Not applicable	
		X, Y, F, Z, T, C, M, S, L, D, UW, integer	
N	WORD	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	

<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 number of N bits beginning with D.



5.5.174 Logical Operation Instruction (WORL)

o ins	Logical peration struction	Applicable model LP-S044, LP-S070,					
OP	DATA type	Available device / Description / Range			,		
		X, Y, F, Z, T, C, M, S, L, D, UW, integer	Erro	Zer	Car	Bori	Ste
S1	WORD	Data address to execute the 'OR' operation with S2	9r	0	Ϋ́	row	σ
		0(h0000) to 65535(hFFFF)		\bigcirc			9
		X, Y, F, Z, T, C, M, S, L, D, UW					
S2	WORD	Data address to execute the 'OR' operation with S1					
		0(h0000) to 65535(hFFFF)					
		Y, F, Z, T, C, M, S, L, D, UW					
D	WORD	Address to save the operation result					
		0(h0000) to 65535(hFFFF)					
		X, Y, F, Z, T, C, M, S, L, D, UW, integer					
Ν	WORD	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					

<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.



ا ol ins	Logical peration struction	DORL	DORL S1 S2 D N									
									S044	1, LP-	-S07	0,
), LP-	-A10	4
ОР	DATA type	Available dev	ice / Des	criptio	n / Ra	nge						
		X, Y, F, Z, T, C,	M, S, L, [D, UW, i	integer			Erro	Zer	Car	Bori	Ste
S1	DWORD	Data address to	execute	the 'OF	R' opera	ation with S2) Y	0	Ŋ	row	0
		0(h0000) to 4294967295(hFFFFFFF)							\bigcirc			9
		X, Y, F, Z, T, C, M, S, L, D, UW]				
S2	DWORD	Data address to execute the 'OR' operation with S1										
		0(h0000) to 4294967295(hFFFFFFF)										
		Y, F, Z, T, C, M,	S, L, D, I	JW								
D	DWORD	Address to save	e the ope	ration re	esult							
		0(h0000) to 429	94967295	(hFFFF	FFFF)							
		X, Y, F, Z, T, C,	M, S, L, [D, UW, i	integer							
Ν	WORD	The number of operation with S	S2 data a S1	address	and sa	ved address	to execute the					
		In the range wit	hin the co	orrespoi	nding d	levice area o	f S2 and D					

5.5.175 Logical Operation Instruction (DORL)

<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.



5.5.176 Logical Operation Instruction (XOR)



<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.



o in:	Logical peration struction	DXOR	S1	S2	D			Арр	olicat	ole m	odel	
								LP-	S044	1, LP	-S070),
								LP-/	A070), LP	-A104	4
OP	DATA type	Available de	vice / Des	criptio	n / Rango	9		1				
		X, Y, F, Z, T, C	, M, S, L, I	D, UW, i	integer			Erro	Zer	Car	Bon	Ste
S1	S1 DWORD Data address to execute the 'XOR' operation with S2						Ÿ	0	Ŋ	row	0	
		0(h0000) to 4294967295(hFFFFFFF)							\bigcirc			7
		X, Y, F, Z, T, C	, M, S, L, I	D, UW, i	integer			. <u></u>				
S2	DWORD	Data address	to execute	the 'XC)R' operat	ion with S1		1				
		0(h0000) to 42	294967295	i(hFFFF	FFFF)			1				
		Y, F, Z, T, C, N	1, S, L, D, I	UW				l				
D	DWORD	Address to sa	ve the ope	ration re	esult			l				
		0(h0000) to 42	294967295	6(hFFFF	FFFF)			l				

5.5.177 Logical Operation Instruction (DXOR)

<Ladder>

X00000	DXOR	M0000	M0050	D0000
1				END

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.



5.5.178 Logical Operation Instruction (AXOR)

ا ol ins	Logical Deration Struction	AXOR S1 S2 D N	Apr LP- LP-	olicat S044 A070	ole m 1, LP-), LP-	odel S070	0, 4
OP	DATA type	Available device / Description / Range					
S1	віт	X, Y, F, T, C, M, UB Start address of the bit device to execute the 'XOR' operation with S2	Error	Zero	Carry	Borrow	Step
		Not applicable		\bigcirc			9
	віт	X, Y, F, T, C, M, UB					
S2		Start address of the bit device to execute the 'XOR' operation with S1					
		Not applicable					
		Y, F, T, C, M, UB					
D	BIT	Address to save the operation result					
		Not applicable					
		X, Y, F, Z, T, C, M, S, L, D, UW, integer					
Ν	WORD	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					

<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.



5.5.179 Logical Operation Instruction (XORL)

l oj ins	Logical peration struction	XORL S1 S2 D N	App LP-	olicat S044 A070	ole m 1, LP [.]), LP [.]	odel -S07(-A10 [_]	D, 1
OP	DATA type	Available device / Description / Range					
		X, Y, F, Z, T, C, M, S, L, D, UW, integer	Errc	Zero	Car	Bori	Step
S1	WORD	Data address to execute the 'XOR' operation with S2	٥r	0	Ŋ	, OM	0
		0(h0000) to 65535(hFFFF)		\bigcirc			9
		X, Y, F, Z, T, C, M, S, L, D, UW					
S2	WORD	Data address to execute the 'XOR' operation with S1					
		0(h0000) to 65535(hFFFF)					
		Y, F, Z, T, C, M, S, L, D, UW					
D	WORD	Address to save the operation result					
		0(h0000) to 65535(hFFFF)					
	WORD	X, Y, F, Z, T, C, M, S, L, D, UW, integer					
Ν		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					

<Ladder>



B15

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.

в0



5.5.180 Logical Operation Instruction (DXORL)

l or ins	Logical peration struction	DXORL S1 S2 D N	Applicable model LP-S044, LP-S070, LP-A070, LP-A104
OP	DATA type	Available device / Description / Range	
		X, Y, F, Z, T, C, M, S, L, D, UW, integer	Ster Car
S1	DWORD	Data address to execute the 'XOR' operation with S2	
		0(h0000) to 4294967295(hFFFFFFF)	◎ 9
	DWORD	X, Y, F, Z, T, C, M, S, L, D, UW	
S2		Data address to execute the 'XOR' operation with S1	
		0(h0000) to 4294967295(hFFFFFFF)	
		Y, F, Z, T, C, M, S, L, D, UW	
D	DWORD	Address to save the operation result	
		0(h0000) to 4294967295(hFFFFFFF)	
		X, Y, F, Z, T, C, M, S, L, D, UW, integer	
Ν	WORD	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	

<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.



(S1)		(S2)	\longrightarrow	(D)
		(S2)+1	\longrightarrow	(D)+1
		(S2)+2	\longrightarrow	(D)+2
		(S2)+3	\longrightarrow	(D)+3
	· · · · ·			•
	:	1	:	:
		(S2)+((N) -1)	\longrightarrow	(D)+((N) -1)

ol in:	Logical peration struction	XNR	S1	S2	D		App	licab	ole m	odel	0
							LP-	A070	ŀ, LP·). LP·	-SU/(-A104	J, 4
OP	DATA type	Available d	evice / Des	scriptic	on / Rang	ge			,	_	
		X, Y, F, Z, T,	C, M, S, L, I	D, UW,	integer		Errc	Zero	Carı	Borr	Step
S1	WORD	Data address	to execute	⇒the 'XN	NR' opera	ation with S2	Jr		2	MO.	
		0(h0000) to 6	35535(hFFF	F)				\bigcirc			7
		X, Y, F, Z, T,	C, M, S, L, I	D, UW,	integer						
S2	WORD	Data address	to execute	e the 'XN	NR' opera	ation with S1					
		0(h0000) to 6	5535(hFFF	FF)							
		Y, F, Z, T, C,	M, S, L, D,	UW							
D	WORD	Address to s	ave the ope	ration r	esult						
		0(h0000) to 6	5535(hFFF	FF)							

5.5.181 Logical Operation Instruction (XNR)

<Ladder>

X00000		1	1	
	XNR	M0000	M0050	D0000
		1	1	
			 	END

 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.
 If the result value is '0', zero flag is SET.



5.5.182 Logical Operation Instruction (DXNR)



<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.



5.5.183 Logical Operation Instruction (AXNR)

L or ins	ogical peration struction	AXNR S1 S2 D	Ν	Applicable model LP-S044, LP-S070, LP-A070, LP-A104
OP	DATA type	Available device / Description / Ran	ge	
		X, Y, F, T, C, M, UB		Ste Bor Car Zer
S1	віт	Start address of the bit device to execute t	he 'XNR' operation with S2	
		Not applicable		◎ 9
		X, Y, F, T, C, M, UB		
S2	ВІТ	Start address of the bit device to execute t	he 'XNR' operation with S1	
		Not applicable		
		Y, F, T, C, M, UB		
D	BIT	Start address of the bit device to save th	e operation result	
		Not applicable		
		X, Y, F, Z, T, C, M, S, L, D, UW, integer		
N	WORD	The number of bit devices to execute the start address	e operation including the	
		As many as the number of devices rema S1, S2, and D area	ained in the corresponding	

<Ladder>

X00000		1	1		
	AXNR	M00000	M00100	M01000	D0000
······································		1			
1		1			END

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.



5.5.184 Logical Operation Instruction (XNRL)

ا op ins	Logical Deration Struction	XNRL S1 S2 D N	Apr LP-	olicat S044	ole mo 1, LP-	odel ∙S07(∙A102	D, 1
OP	DATA type	Available device / Description / Range		/ 10 / 1	, ∟	/110	•
		X, Y, F, Z, T, C, M, S, L, D, UW, integer	Erro	Zer	Car	Bor	Ste
S1	WORD	Data address to execute the 'XNR' operation with S2	or	0	Ŋ	row	σ
		0(h0000) to 65535(hFFFF)		\bigcirc			9
		X, Y, F, Z, T, C, M, S, L, D, UW					
S2	WORD	Data address to execute the 'XNR' operation with S1					
		0(h0000) to 65535(hFFFF)					
		Y, F, Z, T, C, M, S, L, D, UW					
D	WORD	Address to save the operation result					
		0(h0000) to 65535(hFFFF)					
	WORD	X, Y, F, Z, T, C, M, S, L, D, UW, integer					
Ν		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					

<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.



5.5.185 Logical Operation Instruction (DXNRL)

ا ol ins	Logical peration struction	DXNRL S1 S2 D N	Арр	olicat	ole m	odel	
			LP-	S044	1, LP	-S07	0,
			LP-	A070), LP	-A10	4
OP	DATA type	Available device / Description / Range					
		X, Y, F, Z, T, C, M, S, L, D, UW, integer	Erro	Zer	Car	Bon	Ste
S1	DWORD	Data address to execute the 'XNR' operation with S2	ÿ	0	Ŋ	row	δ
		0(h0000) to 4294967295(hFFFFFFF)		\bigcirc			9
		X, Y, F, Z, T, C, M, S, L, D, UW					
S2	DWORD	Data address to execute the 'XNR' operation with S1					
		0(h0000) to 4294967295(hFFFFFFF)					
		Y, F, Z, T, C, M, S, L, D, UW					
D	DWORD	Address to save the operation result					
		0(h0000) to 4294967295(hFFFFFFF)					
		X, Y, F, Z, T, C, M, S, L, D, UW, integer					
Ν	WORD	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					

<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.





5.5.186 BIN/BCD conversion Instruction (BIN2BCD)

	BI cor ins	N/BCD oversion truction	BIN2BCD S D	Apr LP- LP-	blicable model S044, LP-S070, A070, LP-A104
OF)	DATA type	Available device / Description / Range		
		WORD	X, Y, F, Z, T, C, M, S, L, D, UW, integer	Erro	Step Borr Carr
5	5		Device number which has to be transmitted data or data	ſ	y wo
			0 to 9999(h0000 to h270F)	\bigcirc	5
			Y, F, Z, T, C, M, S, L, D, UW		
)	WORD	Device address to save converted data		
			h0000 to h9999		

<Ladder>

1	BIN2BCD	M0000	D0000
 			END

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.



5.5.187 BIN/BCD conversion Instruction (DBIN2BCD)

B co in:	IN/BCD nversion struction	DBIN2BCD S D	App LP- LP-	blicable model S044, LP-S070, A070, LP-A104
OP	DATA type	Available device / Description / Range		
		X, Y, F, Z, T, C, M, S, L, D, UW, integer	Errc	Step Carr
S	DWORD	Device number which has to be transmitted data or data	Ÿ,	O IV IO
		0 to 99999999(h00000000 to h05F5E0FF)	\bigcirc	5
		Y, F, Z, T, C, M, S, L, D, UW		
D	DWORD	Device address to save converted data		
		h00000000 to h99999999		

<Ladder>

X00000			
	DBIN2BCD	M0000	D0000
1	1		
			END

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.



5.5.188 BIN/BCD conversion Instruction (BCD2BIN)

B co ins	IN/BCD nversion struction	BCD2BIN S D	Applicable model LP-S044, LP-S070, LP-A070, LP-A104
OP	DATA type	Available device / Description / Range	
		X, Y, M, S, T, C, D, Z, F, UW, integer	Step Borr Carr Zerc
S	WORD	Device address which saves BCD data to be converted as BIN value	
		h0000 to h9999	◎ 5
		Y, M, S, T, C, D, Z, F, UW	
D	WORD	Device address to save converted data	
		0 to 9999(h0000 to h270F)	
			-

<Ladder>

X00000	BCD2BIN	M0000	M0100
			END

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.



5.5.189 BIN/BCD conversion Instruction (DBCD2BIN)

B co in:	IN/BCD nversion struction	DBCD2BIN S D	App LP-: LP-:	olicat S044 A070	ole m I, LP), LP	odel -S07(-A104	0, 4
OP	DATA type	Available device / Description / Range					
		X, Y, M, S, T, C, D, Z, F, UW, integer	Erro	Zero	Car	Bori	Step
S	DWORD	Device address which saves BCD data to be converted as BIN value	ř	0	Ŋ	, OM	0
		h0000000 to h99999999	\bigcirc				5
		Y, M, S, T, C, D, Z, F, UW					
D	DWORD	Device address to save converted data					
		0 to 99999999(h00000000 to h05F5E0FF)					

<Ladder>

×00000		M0000	M0100
			END

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.

в	B0						
S word	0 1 1 1 1 1 0 0 1 1 0 0 1 0 1 0 1 0 0 1 0 1 0 1 1 0 0 1 1 0 0 0 1 1 0						
BCD data 79461039							
	BIN data h4BC7AAF						
B	B0						
D word	0 0 0 0 0 1 0 1 1 1 1 1 1 1 0 0 1 1 1 1						

5.5.190 String conversion Instruction (BIN2HASC)

co ins	String nversion struction	BIN2HASC S D	App LP-	olicab S044 A070	le mo , LP-	odel ·S070, -A104
OP	DATA type	Available device / Description / Range			,	
		X, Y, M, S, T, C, D, Z, F, UW, integer	Erro	Zer	Car	Ste _l Bor
S	WORD	Device address which saves to be converted data as ASCII value	or	0	Ŋ	TOX
		h0000 to hFFFF				5
		Y, M, S, T, C, D, Z, F, UW				
D	WORD	Device address to save converted data				
		Allowable range per byte(h30 to h39, h41 to h46)				

<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'.



5.5.191 String conversion Instruction (DBIN2HASC)

co in:	String nversion struction	DBIN2HASC S D	App LP-3 LP-4	olicat S044 A07(ole m I, LP [.]), LP [.]	odel -S070, -A104
OP	DATA type	Available device / Description / Range				
		X, Y, M, S, T, C, D, Z, F, UW, integer	Erro	Zerc	Carı	Step Borr
S	DWORD	Device address which saves to be converted data as ASCII value	r	0	Y	-OW
		h00000000 to hFFFFFFF				5
		Y, M, S, T, C, D, Z, F, UW				
D	QWORD	Device address to save converted data				
		Allowable range per byte (h30 to h39, h41 to h46)				

<Ladder>

X00000	D BIN2HASC	M0000	M0100
			END

1. Converts the BINARY data stored in S double word into the HEX ASCII one by one in order from the upper order value.

The converted value is sequentially stored in D quad word beginning with D, by 2 digits per word.
 The operation range is h00000000 to HFFFFFFF.



5.5.192 String conversion Instruction (HASC2BIN)

col ins	String nversion struction	HASC2BIN S D	Apr LP- LP-	olicat S044 A070	ole m I, LP·), LP·	odel -S070 -A104),
OP	DATA type	Available device / Description / Range]				
		X, Y, M, S, T, C, D, Z, F, UW	Erro	Zer	Car	Bor	Ste
S	WORD	Device address which saves HEX ASCII value to be converted data as BIN value	br	0	ſŸ	row	σ
		Allowable range per byte (h30 to h39, h41 to h46)	\bigcirc				5
		Y, M, S, T, C, D, Z, F, UW					
D	WORD	Device address to save converted data					
		h0000 to hFFFF					
			_				

<Ladder>

x00000	HASC2BIN	M0000	M0100
			END

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



5.5.193 String conversion Instruction (DHASC2BIN)

co ins	String nversion struction	DHASC2BIN S D	App LP- LP-	olicat S044 A070	le m ⊧, LP-), LP-	odel -S07(-A104	0, 4
OP	DATA type	Available device / Description / Range					
		X, Y, M, S, T, C, D, Z, F, UW	Erro	Zer	Car	Bor	Ste
S	DWORD	Device address which saves HEX ASCII value to be converted data as BIN value	or	0	Ϋ́	row	σ
		Allowable range per byte (h30 to h39, h41 to h46)	\bigcirc				5
		Y, M, S, T, C, D, Z, F, UW					
D	DWORD	Device address to save converted data					
		h00000000 to hFFFFFFF					
			-				

<Ladder>

X00000	DHASC2BIN	M0000	M0100 .
	 		END

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)



5.5.194 String conversion Instruction (BCD2DASC)

cor ins	String nversion struction	BCD2DASC S D	App LP-	olicat S044	ble m 1, LP	odel -S07	0,
			LP- 1	AUT	J, LP [.]	-ATU	4
OP	DATA type	Available device / Description / Range					
		X, Y, M, S, T, C, D, Z, F, UW, integer	Erro	Zer	Car	Bor	Ste
S	WORD	Device address which saves the data to be converted data as ASCII value	or	0	Ŷ	row	σ
		h0000 to hFFFF	\bigcirc				5
		Y, M, S, T, C, D, Z, F, UW					
D	DWORD	Device address to save converted data					
		Allowable range per byte (h30 to h39, h41 to h46)					
	•	·	•				

<Ladder>

X00000		M0000	M0100
	+		
			END
	·	 ÷+	_

1. Recognizes BCD data stored in S word as decimal number, converts each digit into the ASCII value and then stores them sequentially 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.



5.5.195 String conversion Instruction (DBCD2DASC)

co ins	String nversion struction	DBCD2DASC S D	App LP- LP-	plicable model -S044, LP-S070, -A070, LP-A104
OP	DATA type	Available device / Description / Range		
		X, Y, M, S, T, C, D, Z, F, UW, integer	Erro	Step Carr
c		Device address which saves the BCD data to be converted data	Ĩ	
5	DVVORD	as ASCII value		
		h00000000 to h999999999	\bigcirc	5
		Y, M, S, T, C, D, Z, F, UW		
D	QWORD	Device address to save converted data		
		Allowable range per byte (h30 to h39, h41 to h46)		
			-	

<Ladder>

X00000	1	DBCD2DASC	M0000	M0100
				END

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.

The operation range is h00000000 to h99999999.
 If the S word is not the BCD code, error flag is SET.



5.5.196 String conversion Instruction (DASC2BIN)

col ins	String nversion struction	DASC2BIN S D	App LP- LP-	olicab S044 A070	ole mo I, LP-), LP-	odel -S07 -A10	0, 4
OP	DATA type	Available device / Description / Range					
		X, Y, M, S, T, C, D, Z, F, UW	Erro	Zer	Car	Bor	Ste
S	WORD	Device address which saves the Dec ASCII data to be converted as BIN value	y	0	Ŋ	row	δ
		h30 to h39 per byte except sign bit (h2D, h28)	\bigcirc				5
		Y, M, S, T, C, D, Z, F, UW				·	
D	WORD	Device address to save converted data					
		-32768(h8000) to 32767(h7FFF)					
			-				

<Ladder>

x00000		DASC2BIN	M0000	M0100
				END

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.


5.5.197 String conversion Instruction (DDASC2BIN)

co ins	String nversion struction	DDASC2BIN S D	Applicable model LP-S044, LP-S070, LP-A070, LP-A104
OP	DATA type	Available device / Description / Range	
		X, Y, M, S, T, C, D, Z, F, UW, integer	Errc Errc
S	WORD	Device address which saves the Dec ASCII data to be converted as BIN value	
		h30 to h39 per byte except sign bit (h2D, h28)	◎ 5
		Y, M, S, T, C, D, Z, F, UW	
D	DINT	Device address to save converted data	
		-2147483648(h80000000) to 2147483647(hFFFFFFF)	

<Ladder>

x00000	DASC2BIN	M0000	M0100
			END

 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.
 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 (h7FFFFFF).

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.

S word The highest ASCII code value Sign data value S word+1 3rd ASCII code value 2nd ASCII code value S word+2 5th ASCII code value 4th ASCII code alue S word+3 7th ASCII code value 6th ASCII code value	B1	15 E	B8 B	87 В	0
S word+1 3rd ASCII code value 2nd ASCII code value Code Decimal data Bit S word+2 5th ASCII code value 4th ASCII code alue Code Code Code Bit S word+3 7th ASCII code value 6th ASCII code value 6th ASCII code value Code Code Code Code	word	The highest ASCII code value		Sign data value	
S word+2 5th ASCII code value 4th ASCII code alue converting Sconverting S word+3 7th ASCII code value 6th ASCII code value	word+1	3rd ASCII code value		2nd ASCII code value	Code Decimal data BIN data
S word+3 7th ASCII code value 6th ASCII code value	word+2	5th ASCII code value		4th ASCII code alue	converting become data
	word+3	7th ASCII code value		6th ASCII code value	
S word+4 9th ASCII code value 8th ASCII code value	word+4	9th ASCII code value		8th ASCII code value	
S word+5 H00 10th ASCII code value	word+5	H00		10th ASCII code value	

5.5.198 String conversion Instruction (STR2ASC)

co ins	String nversion struction	STR2ASC S D	Apr LP- LP-	blicable model S044, LP-S070, A070, LP-A104
OP	DATA type	Available device / Description / Range		
		STRING	Erro	Ster Bon Car
S	STRING	STRING data to convert as ASCII value	or	D ITY FOW
		String		7
		Y, M, S, T, C, D, Z, F, UW		
D	WORD	Device address to save converted data		
		ASCII value		

<Ladder>

X00000	BTR2ASC	M0000	M0100
			END

1. Converts STRING into the ASCII and then stores it sequentially into the D.

2. It is available to input up to 128 characters.

S word Auto ASCII code D word H76(u) H41(A) String String D word+1 H6F(o) H74(t)				В	15 B8	3 B7	в
String D word+1 H6F(o) H74(t)	S word	Auto	ASCII code	D word	H76(u)	H41(A)	
	o word	String	converting ´	D word+1	H6F(o)	H74(t)	

5.5.199 String conversion Instruction (DASC2BCD)

co ins	String nversion struction	DASC2BCD S D	App LP-	blicable model S044, LP-S070, A070, LP-A104
OP	DATA type	Available device / Description / Range		
		X, Y, M, S, T, C, D, Z, F, UW, integer	Erro	Ster Car
S	WORD	Device address which saves the Dec ASCII data to be converted as BCD value	or	p row ry
		h30 to h39 per byte except sign bit (h2D, h28)	\bigcirc	5
		Y, M, S, T, C, D, Z, F, UW		
D	WORD	Device address to save converted data		
		h0000 to h9999		

<Ladder>

X00000				
-		ASC2BCD	M0000	M0100
	I I			
				END

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.

В	15 B8	B7	B0		
S word	H36(6)	H34(4)	$\frac{\text{code}}{\text{converting}} \rightarrow 4660 \longrightarrow \text{D word}$	H4660	
0	1100(0)	1100(0)	Decimal	BCD data	
S word+1	H30(0)	H36(6)	data		

5.5.200 String conversion Instruction (DDASC2BCD)

col ins	String nversion struction	DDASC2BCD S D	App LP- LP-	olicat S044 A070	ole m 1, LP [.]), LP [.]	odel -S07 -A10	0, 4
OP	DATA type	Available device / Description / Range					
		X, Y, M, S, T, C, D, Z, F, UW, integer	Erro	Zer	Car	Bor	Ste
S	WORD	Device address which saves the Dec ASCII data to be converted as BCD value	or	0	Ŷ	row	σ
		Allowable range per byte (h30 to h39)	\bigcirc				5
		Y, M, S, T, C, D, Z, F, UW					
D	DWORD Device address to save converted data						
		h00000000 to h99999999					

<Ladder>

X00000							
- ⊢				1	DDASC2BCD	M0000	M0100
	T	T	1	T			
		-		1			END
	+	+	÷		÷÷-		

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)

в	15 B8	B7 B()		
S word	2nd ASCII code value	The highest ASCII code	Code	Decimal	BCD data
S word+1	4th ASCII code value	3rd ASCII code value	converting	data	
S word+2	6th ASCII code value	5th ASCII code value			
S word+3	8th ASCII code value	7th ASCII code value			

5.5.201 String conversion Instruction (BIN2DASC)

co in:	String nversion struction	BIN2DASC S D	App LP-	olical S044	ole m 4, LP·	odel -S070,
			LP-	A07), LP·	-A104
OP	DATA type	Available device / Description / Range				
		X, Y, M, S, T, C, D, Z, F, UW, integer	Erro	Zer	Car	Step
S	WORD	Device address which saves the data to be converted as ASCII value	٥r	0	Ŋ	NON O
		-32768(h8000) to 32767(h7FFF)		-		5
		Y, M, S, T, C, D, Z, F, UW				
D	WORD	Device address to save converted data				
		h30 to h39 per byte except sign bit (h2D, h28)				
	•	•				

<Ladder>

×00000		BIN2DASC	M0000	M0100
				END
	T		r	

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).



5.5.202 String conversion Instruction (DBIN2DASC)

co ins	String nversion struction	DBIN2DASC S D	Applicable model LP-S044, LP-S070, LP-A070, LP-A104
OP	DATA type	Available device / Description / Range	
		X, Y, M, S, T, C, D, Z, F, UW, integer	Erro Zero
S	DINT	Device address which saves the data to be converted as ASCII value	
		-2147483648(h80000000) to 2147483647(hFFFFFFF)	○ 5
		Y, M, S, T, C, D, Z, F, UW	
D	WORD	Device address to save converted data	
		h30 to h39 per byte except sign bit (h2D, h28)	

<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 (h8000000) to 2147483647 (h7FFFFFFF).



5.5.203 Code conversion Instruction (GRY2BIN)

co ins	Code nversion struction	GRY2BIN S D	App LP- LP-	olicab S044 A070	le m , LP.), LP.	odel -S070, -A104	
OP	DATA type	Available device / Description / Range					
		X, Y, M, S, T, C, D, Z, F, UW, integer	Erro	Zer	Car	Ste _l Bor	
S	WORD	Device address which saves the GRAY code data to be converted as BIN value	9r	0	ſŸ		
		0(h0000) to 65535(hFFFF)				5	
		Y, M, S, T, C, D, Z, F, UW					
D	WORD	Device address to save converted data					
		0(h0000) to 65535(hFFFF)					

<Ladder>

: :		
GRY2BIN	M0000	M0100
		END
	GRY2BIN	GRY2BIN M0000

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



5.5.204 Code conversion Instruction (DGRY2BIN)

co in:	Code nversion struction	DGRY2BIN S D	Apr LP-	blicable model S044, LP-S070, A070, I P-A104
OP	DATA type	Available device / Description / Range		
		X, Y, M, S, T, C, D, Z, F, UW, integer	Erro	Ste Bor Car
S	DWORD	Device address which saves the GRAY code data to be converted as BIN value	or	o ry row
		0(h0000000) to 4294967295(hFFFFFFF)		5
		Y, M, S, T, C, D, Z, F, UW		
D	DWORD	Device address to save converted data		
		0(h00000000) to 4294967295(hFFFFFFF)		

<Ladder>



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

в	31																					в	D
S double word	1	0	1	1	1	0	1	0	0	1	1	0		•	•	•	0	ŀ	1	1	0	D	GRAY code
	\downarrow	+	*	*	+				+	+	+	*	+/				+	+	+		+	,	
D double word	1	1	0	1	0	0	1	1	1	0	1	1		•	•	•	0	ŀ	1	0	0	D	BIN code

5.5.205 Code conversion Instruction (BIN2GRY)

co ins	Code nversion struction	BIN2GRY S D	App LP- LP-	olicab S044 A070	le m , LP-), LP-	odel -S07(-A104	D, 4
OP	DATA type	Available device / Description / Range					
		X, Y, M, S, T, C, D, Z, F, UW, integer	Erro	Zer	Car	Bor	Ste
S	WORD	Device address which saves the data to be converted as GRAY code value	9r	0	γ	row	σ
		0(h0000) to 65535(hFFFF)					5
		Y, M, S, T, C, D, Z, F, UW					
D	WORD	Device address to save converted data					
		0(h0000) to 65535(hFFFF)					

<Ladder>

XOOOO			1
	BIN2GRY	M0000	M0100
			END

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



5.5.206 Code conversion Instruction (DBIN2GRY)

C ir	Code onversion ostruction	DBIN2GRY S D	Applicable model LP-S044, LP-S070, LP-A070, LP-A104
OP	DATA type	Available device / Description / Range	
		X, Y, M, S, T, C, D, Z, F, UM, integer	Ster Car
S	DWORD	Device address which saves the data to be converted as GRAY code value	
		0(h00000000) to 4294967295(hFFFFFFF)	5
		Y, M, S, T, C, D, Z, F, UW	
D	DWORD	Device address to save converted data	
		0(h0000000) to 4294967295(hFFFFFFF)	
			_

<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.

В	B31													во								0
S double word	1	0	1	1	1	0	1	0	0	1	1	0	•				0	1	1		0	BIN code
Didautala	\bigvee	+	+	+	+	+	+	+ +	+ ×	+	+ ×	+				1	+	+	+	+	ĺ	
word	1	1	1	0	0	1	1	1	0	1	0	1	•				0	1	1)	1	GRAY code

5.5.207 Sign reversal Instruction (NEG)

Sig in	n reversal struction	NEG	D	Арр	licab	le m	odel	
				LP-S	5044	, LP-	-S070),
				LP-A	4070	, LP-	-A104	1
OP	DATA type	Available de	evice / Description / Range					
		Y, M, S, T, C,	D, Z, F, UW	Erro	Zero	Carı	Borr	Step
D	WORD	Device addre	ss to convert sign	7	0	2	WO.	
		0(h0000) to 6	5535(hFFFF)					3

<Ladder>

X00000				I
	1		NEG	M0000
		r		
	1		1	END
				- Ŋ

Reverses the sign of D word.

	D(Destination H0001	n) word Sign reversing	D(Destination) word HFFFF
--	------------------------	------------------------------	------------------------------

5.5.208 Sign reversal Instruction (DNEG)

Sigi ins	n reversal struction	DNEG	D	App LP-3 LP-7	licab S044 A070	le mo , LP-), LP-	odel -S07(-A104	0, 4
OP	DATA type	Available device	e / Description / Range					
		Y, M, S, T, C, D, Z	, F, UW	Erro	Zero	Car	Bon	Step
D	DWORD	Device address to	convert sign	Ÿ		Ŋ	, MO,	0
		0(h0000000) to 4	1294967295(hFFFFFFF)					3

<Ladder>

X00000		1
-	DNEG	M0000
1	1	END

Reverses the sign of D double word.

D(Destination) double word	Sign	D(Destination) double word
H11110001	reversing	HEEEEFFFF





<Ladder>



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



5.5.210 Data conversion Instruction (ENCO)



<Ladder>

X00000		1	1	
-	ENCO	M0000	M0100	D0000
				END

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.



5.5.211 Data conversion Instruction (EXT)



<Ladder>



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



5.5.212 Refresh Instruction (REF)

R ins	efresh truction	REF D N	Ν	App LP-\$ LP-4	licab 5044 4070	le mo , LP- , LP-	odel ∙S07(∙A104), 1
OP	DATA type	Available device / Descri	iption / Range					
		Χ, Υ		Щ	Ze	Ca	Во	Ste
D	віт	Input/Output bit device		, Or	ō	irry	rrow	de
		Not applicable						5
		X, Y, M, S, T, C, D, Z, F, UW	/, integer					
Ν	WORD	The number of bit devices to	o refresh from D bit					
		0 to 65535						

<Ladder>

X00000	REF	X0000	Y0000
			END

Refreshes the number of N bit devices beginning with $\ensuremath{\mathsf{I/O}}\xspace$ D bit device.

5.5.213 Display Instruction (SEG)

l in:	Display struction	SEG S	D	N		Apr LP- LP-	olicat S044 A070	ole m 1, LP·), LP·	odel -S07(-A10/	0, 4
OP	DATA type	Available device / D	escripti	on / F	Range					
		X, Y, M, UB	Errc	Zero	Carı	Borr	Step			
S	віт	Address which saves) r		2	, OM				
		Not applicable								7
		Y, M, UB								<u> </u>
D	BIT	Address to save the decoded data								
		Not applicable								
		X, Y, M, S, T, C, D, Z, F, UW, integer\								
Ν	WORD	The number of data to be decoded								

<Ladder>

X00000				- I
	SEG	M00000	M00010	D0000
				END .

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.

4 inp	ut bit	Segment structure	DECODE							Segment	
Hex.	Bit		h	g	f	е	d	с	b	а	display
0	0000		0	0	1	1	1	1	1	1	0
1	0001	f a b	0	0	0	0	0	1	1	0	1
2	0010		0	1	0	1	1	0	1	1	2
3	0011	e c	0	1	0	0	1	1	1	1	3
4	0100		0	1	1	0	0	1	1	0	4
5	0101	d	0	1	1	0	1	1	0	1	5
6	0110		0	1	1	1	1	1	0	1	6
7	0111	Segment data decode	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
Α	1010		0	1	1	1	0	1	1	1	Α
В	1011		0	1	1	1	1	1	0	0	В
С	1100		0	0	1	1	1	0	0	1	С
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



5.5.214	Clock	Instruction	(TCMP)
---------	-------	-------------	--------

in	Clock struction	ТСМР	S1	S2	S 3	S4	D		Apr LP-	olicabl ∙S044, -A070	e mo LP- I P-	odel S07(A10₂), 4
OP	DATA type	Available de	vice / Des	criptio	on / Ra	nge]				
		X, Y, M, S, T,	C, D, Z, F,	UW, int	eger				Err	Zer	Car	Bor	Ste
S1	WORD	Device addre data of S4	ss which sa	aves the	e data t	o be cor	npare	d with 'hour'	or	0	Ϋ́	row	σ
		0(h0000) to 2	3(h0017)						\bigcirc				7
		X, Y, M, S, T,	C, D, Z, F,	UW, int	eger								
S2	WORD	Device addre data of S4	ss which sa	aves the	e data t	o be cor	npare	d with 'minute'					
		0(h0000) to 5	9(h0038)										
		X, Y, M, S, T,	C, D, Z, F,	UW, int	eger								
S 3	WORD	Device addre 'second' data	ss which sa of S4	aves the	e data t	o be cor	npare	d with					
		0(h0000) to 5	9(h0038)										
		X, Y, M, S, T,	C, D, Z, F,	UW									
S4	WORD	Device addres of S1, S2 and	s, which sa S3.	ives the	data to	be com	bared	with the data					
		Time data rar	ige										
		Y, M, S, T, C,	Z, F, UB										
D	BIT	Bit device add	dress to sa	ve the o	compari	son resi	ult						
		Not applicable	e										

<Ladder>



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

5.5.215 Clock Instruction (TADD)

ins	Clock struction	TADD S1 S2 D	Арр	licab	le m	odel	
			LP-	S044	, LP-	S070),
			LP-	A070	, LP-	A104	1
OP	DATA type	Available device / Description / Range					
		X, Y, M, S, T, C, D, Z, F, UW	Erro	Zer	Car	Bor	Ste
S1	WORD	Device address which saves the data to execute the time addition operation with S2	or	0	'ry	row	q
		Time data range	\bigcirc		\bigcirc		7
		X, Y, M, S, T, C, D, Z, F, UW					
S2	WORD	Device address which saves the data to execute the time addition operation with S1					
		Time data range					
		Y, M, S, T, C, D, Z, F, UW					
D	WORD	Address to save the operation result					
		Time data range					

<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.



5.5.216 Clock Instruction (TSUB)

ins	Clock struction	TSUB S1 S2 D	App LP-	olicat S044 A070	ole m ŀ, LP [.]). LP [.]	odel -S07(-A10/	D, 4
OP	DATA type	Available device / Description / Range			,		
		X, Y, M, S, T, C, D, Z, F, UW	Erro	Zer	Car	Bor	Ste
S1	WORD	Device address which saves the data to execute the time subtraction operation with S2	or	0	Ϋ́	row	σ
		Time data range	\bigcirc	\bigcirc		\bigcirc	7
		X, Y, M, S, T, C, D, Z, F, UW					
S2	WORD	Device address which saves the data to execute the time subtraction operation with S1					
		Time data range					
		Y, M, S, T, C, D, Z, F, UW					
D	WORD	Address to save the operation result					
		Time data range					

<Ladder>

X00000		1	1	1
	TSUB	M0000	M0050	D0000
· · · · · · · · · · · · · · · · · · ·	-			
1				END
· · · · · · · · · · · · · · · · · · ·		+	÷;	

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.



5.5.217 Clock Instruction (TRD)

in	Clock struction	TRD	D	Арр	licable model
				LP-	S044, LP-S070,
_				LP-/	A070, LP-A104
OP	DATA type	Available device	e / Description / Range		
		Y, M, S, T, C, D, Z	z, f, UW	Erro	Step Borr Carr
D	WORD	Device address to	o save the real time value	, F	
		Not applicable			3

<Ladder>



7. Day of week in D+6 word



5.5.218 Clock Instruction (TWR)

ir	Clock struction	TWR	D	Арр	licab	le mo	odel	
				LP-	S044	, LP-	·S070	0,
				LP-/	4070), LP-	·A104	4
OP	DATA type	Available device	e / Description / Range					
		Y, M, S, T, C, D, Z	, F, UW	Erro	Zer	Car	Bori	Ste
D	WORD	Device address w register	hich saves the time data to write on special	Ÿ	0	Ŋ	ſOW	0
		Time data range						3

<Ladder>

				1. Year in D word
X00000				2. Month in D+1 word (1 to 12)
		TWR	D0000	3. Date in D+2 word (1 to 31)
				4. Hour in D+3 word (1 to 23)
	1		END	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.
				Stores the time value into the corresponding position of special register.
				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.



5.5.219 Clock Instruction (HOUR)

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 Image 0(h0000) to 65535(hFFFF) Image VORD Vortice address which saves the executed time value	ins	Clock struction	HOUR	S	D1	D2	Apr LP-	blicable model S044, LP-S070),
S WORD X, Y, M, S, T, C, D, Z, F, UW, integer Image: Comparison of the second se	OP	DATA type	Available device	/ Desc	riptior	n / Range		AU70, LP-A104	ŀ
S WORD Data device address to designate the accumulated time Q O Z Q 0(h0000) to 65535(hFFFF) 0(h0000) to 65535(hFFFF) I			X, Y, M, S, T, C, D,	Z, F, U	W, inte	ger	Erro	Bor Car Zer	Ste
0(h0000) to 65535(hFFFF) Y, M, S, T, C, D, Z, F, UW D1 WORD Data device address which saves the executed time value 0(n0000) to 65535(hFFFF)	S	WORD	Data device addres	ss to de	esignate	e the accumulated time		o ry row	σ
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)				7
D1 WORD Data device address which saves the executed time value			Y, M, S, T, C, D, Z,	F, UW					LJ
	D1	WORD	Data device addres	ss whic	h save	s the executed time value			
0(h0000) to 65535(hFFFF)			0(h0000) to 65535(hFFFF)				
Y, M, UB			Y, M, UB						
D2 BIT The compared result between the executed time (D1) and the designated accumulated time(S)	D2	BIT	The compared resu designated accumu	ult betw ulated t	/een the ime(S)	e executed time (D1) and the			
Not applicable			Not applicable						

<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 than 1 hour is displayed in D1+1 word device at per one second.

S word (designated > Accumulated ON time of input contact	
D2 bit ON	
Current value per 1 hour	
D1+1 word	
Current value of less than 1 hour (per one second)	

5.5.220 Clock Instruction (TZCP)

in	Clock struction	TZCP S1 S2 S3 D	Applicable model LP-S044, LP-S070, LP-A070, LP-A104
OP	DATA type	Available device / Description / Range	
		X, Y, M, S, T, C, D, Z, F, UW	Ste Bor Zer
S1	WORD	Device address which saves the data to compare with S2 and S3 data	o row
		Time data range	© 9
		X, Y, M, S, T, C, D, Z, F, UW	
S2	WORD	Device address which saves the data to compare with S1 and S3 data	
		Time data range	
		X, Y, M, S, T, C, D, Z, F, UW	
S 3	WORD	Device address which saves the data to compare with S1 and S2 data	
		Time data range	
		Y, M, S, T, C, Z, F, UB	
D	BIT	Bit device address to save comparison result	
		Not applicable	

<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.



5.5.221 Motion Instruction (MTVDM)

N ins	Motion struction	MTVDM S S1 S2 S3 S4 S5	Applicable model LP-S070, LP-A070, LP-A104
ОР	DATA type	Available device / Description / Range	
		X, M, D, Z, UW, integer	Ster Car
S	WORD	Channel(Ch1, Ch2)	
		1 to 2	O 9
		X, M, Z, UB	
S1	BIT	Motion drive direction	
		1: Forward, 0: Backward	
		X, M, D, Z, UW, integer	
S2	DWORD	Drive speed	
		0 to 100,000	
		X, M, D, Z, UW, integer	
S3	WORD	Dwell time	
		0 to 65536ms	
		X, M, D, Z, UW, integer	
S4	WORD	Acceleration time	
		Select acceleration time 1 to 5 in common configuration	4
		X, M, D, Z, UW, integer	4
S5	WORD	Deceleration time	
		Select deceleration time 1 to 5 in common configuration]

<Ladder>

MTVDM	M0000	M00001	M0002	M0003	M0004	M0005
 						END

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 AtLogic.
- 2. Select accel/deceleration time 1 to 5 in common configuration from [Parameter]-[MOTION] tab in AtLogic.
- 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 AtLogic user manual.

5.5.222 Motion Instruction (MTPDM)

n ins	Motion struction	MTPDM S S1 S2 S3 S4 S5	Applicable model LP-S070, LP-A070, LP-A104
OP	DATA type	Available device / Description / Range	
		X, M, D, Z, UW, integer	Ster Car Zerr
S	WORD	Channel (Ch1, Ch2)	
		1 to 256	◎ 9
		X, M, D, Z, UW, integer	
S1	DWORD	Target position	
		-2,147,483,648 to 2,147,483,647 (Enable to set the range)	
		X, M, D, Z, UW, integer	
S2	DWORD	Drive speed	
		0 to 100,000	
		X, M, D, Z, UW, integer	
S3	WORD	Dwell time	
		0 to 65536ms	
		X, M, D, Z, UW, integer	
S4	WORD	Acceleration time	
		Select acceleration time 1 to 5 in common configuration	
		X, M, D, Z, UW, integer	
S5	WORD	Deceleration time	
		Select deceleration time 1 to 5 in common configuration	

<Ladder>

X00000							
	MTPDM	M0000	M0001	M0002	M0003	M0004	M0005
							END

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 AtLogic.
- Select accel/deceleration time 1 to 5 in common configuration from [Parameter]-[MOTION] tab in AtLogic.
- 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 AtLogic user manual.

5.5.223 Motion Instruction (MTIDM)

r ins	Motion struction	MTIDM S S1	App LP-3 LP-7	licat S070 A070	ole m [.]),), LP [.]	odel -A104
OP	DATA type	Available device / Description / Range				
		X, M, D, Z, UW, integer	Erro	Zero	Car	Stej Bori
S	WORD	Channel(Ch1, Ch2)	Ÿ	0	7	row C
		1 to 2	\bigcirc			5
		X, M, D, Z, UW, integer				
S1	WORD	Step number				
		1 to 99				

<Ladder>

X00000 ─── ↑	MTIDM	D0000	D0001
			END

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 AtLogic.

2. There should be pattern number to execute of pattern list from [Parameter]-[MOTION] tab in AtLogic.

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 AtLogic user manual.

-1

5.5.224 Motion Instruction (MTMEC)

Applicable model
LP-S070, LP-A070, LP-A104
n / Range
ror ror
◎ 5
)

<Ladder>

X00000			
	MTIDM	D0000	D0001
			END
			1

Error remove instruction: This instruction removes the error when error flag occurs by error during motion drive.

% For more information, refer to Motion of AtLogic user manual.

5.5.225 Motion Instruction (MTEMS)

N ins	<i>l</i> iotion truction	MTEMS	S	Арр	olicab	le m	odel	
				LP-	S070),		
				LP-	A070), LP-	·A104	4
OP	DATA type	Available device	e / Description / Range					
		X, M, D, Z, UW, in	iteger	Щ	Z€	с С	Вс	St
S	WORD	Channel(Ch1, Ch2	2)	ror	Pro	arry	orrow	ep
		1 to 2		\bigcirc				5

<Ladder>

X00000		MTEMS	D0000
			END
	 ÷		4

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 AtLogic user manual.

5.5.226 Motion Instruction (MTCPP)

in	Motion struction	MTCPP S S1	Apr LP- LP-	blicable model S070, A070, LP-A104
OP	DATA type	Available device / Description / Range		
		X, M, D, Z, UW, integer	Errc	Step Born Can
S	WORD	Channel(Ch1, Ch2)	٥r	
		1 to 2	\bigcirc	5
		X, M, D, Z, UW, integer		
S1	DWORD	Setting value of new position		
		-2,147,483,648 to 2,147,483,647		

<Ladder>

x00000 ↑	MTCPP	M0000	M0001
			END

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.

X For more information, refer to Motion of AtLogic user manual.

5.5.227 Motion Instruction (MTFOS)

N ins	Motion struction	MTFOS	S	App	licab S070	le mo	odel	Λ
OP	DATA type	Available device	/ Description / Range		4070	, LF -	×10	+
		X, M, D, Z, UW, in	teger	Err	Zer	Ca	Вој	Ste
S	WORD	Channel(Ch1, Ch2	2)	٩	Ö	rry	row	ö
		1 to 2		\bigcirc				5

<Ladder>

X00000 — ←	MTFOS	M0000
	 	END

Forced home setting instruction: This instruction sets the specified position as the set home position value in AtLogic.

 $\,\%\,$ For more information, refer to Motion of AtLogic user manual.

5.5.228 Motion Instruction (MTSRS)

n ins	Motion struction	MTSRS	S	App LP-3 LP-7	olicab S070 A070	ole mo),), LP-	odel A104	1
OP	DATA type	Available device	/ Description / Range					
		X, M, D, Z, UW, in	teger	Erro	Zero	Can	Bor	Stel
S	WORD	Channel(Ch1, Ch2	2)	Ÿ	0	7	row	0
		1 to 2		\bigcirc				5

<Ladder>

X00000 ──┤ /↑		МТОВС	M0000
			END

Normal stop instruction: It executes normal stop instruction to the currently motion driving channel.

[Pattern stop method with combination of 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 axes decelerately stop at the same time.
- X For more information, refer to Motion of AtLogic user manual.

5.5.229 Motion Instruction (MTOBC)

N ins	Motion struction	МТОВС	S	App LP- LP-	olicat S070 A070	ole m),), LP	odel -A104	4
OP	DATA type	Available device	e / Description / Range					
		X, M, D, Z, UW, ir	nteger	Errc	Zero	Car	Bon	Ste
S	WORD	Channel(Ch1, Ch	2)	٥r	0	ry	row	0
		1 to 2		\bigcirc				5

<Ladder>

X00000 ──┤ ↑	МТОВС	M0000
		END

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 AtLogic.
- 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]



Origin position is defined by set value from atLogic.

X For more information, refer to Motion of AtLogic user manual.

5.5.230 Motion Instruction (MTOVV)



<Ladder>

MTOVV	M0000	M0001
		END
		MTOVV00000

Speed ON Speed override instruction Speed override Speed override instruction Speed override instruction D: Dwell signal Speed override: It converts the currently operating speed set (unit set) to the other speed and operates with the converted speed.

1. Operating speed >> Changed speed: It converts to changed speed and operates with the changed speed.

2. Operating speed \leq 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 pullout of motor.
- % For more information, refer to Motion of AtLogic user manual.
5.5.231 Motion Instruction (MTOVP)

r ins	Motion struction	MTOVP S S1	Applic LP-SC LP-AC	cable model 070, 070, LP-A104
OP	DATA type	Available device / Description / Range		
		X, M, D, Z, UW, integer	Erro	Ster Car
S	WORD	Channel(Ch1, Ch2)		
		1 to 2	\odot	5
		X, M, D, Z, UW, integer		
S1	WORD	Changed position		
		-2147483647 to 2147483647		
			-	

<Ladder>

X00000			
	MTOVP	M0000	M0001
			END

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.

X For more information, refer to Motion of AtLogic user manual.

5.5.232 Motion Instruction (MTIPT)

N ins	Aotion struction	MTIPT S S1 S4 S4	Applicable model LP-S070, LP-A070, LP-A104
OP	DATA type	Available device / Description / Range	
		Integer	Ster Errc
S	WORD	Channel number of the first axis(Ch1, Ch2)	or v ry row
		1 to 2	◎ 7
	WORD	X, M, D, Z, UW, integer	
S1		Action number of the first axis(it is not pattern number)	
		0 to 65535	
		Integer	
S3	WORD	Channel number of the second axis (Ch0, Ch1)	
		1 to 2	
		X, M, D, Z, UW, integer]
S4	WORD	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 interpolations.

2. The axis, which is more distance than the other, is set as main axis.

Drive data of sub axis is decided by the calculating from the drive data of main axis.
If each distance of two axes is same, CH1 becomes main axis.

% For more information, refer to Motion of AtLogic user manual.

5.5.233 Motion Instruction (MTUAI)

N ins	Motion struction	MTUAI S S1	App LP- LP-	olicat S07(A07()le m(),), LP [.]	odel -A104	
OP	DATA type	Available device / Description / Range					
		X, M, D, Z, UW, integer	Erro	Zero	Can	Bon	Step
S	WORD	Channel(Ch1, Ch2)	F	0	7	ŴŐ	0
		1 to 2	\bigcirc				5
		X, M, D, Z, UW, integer					
S1	WORD	Step number					
		1 to 99					

<Ladder>

X00000				
	MTUAI	M0000	M0001	
			END	

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 AtLogic.

2. There should be pattern number to execute of pattern list from [Parameter]-[MOTION] tab in AtLogic.

3. If the currently operated channel is executed the other instruction, enable channel error occurs.

 $\,\%\,$ For more information, refer to Motion of AtLogic user manual.

5.5.234 High speed counter Instruction (HSCNT)

Hi in	gh speed counter struction	HSCNT S S1 S2 D S3	Applicable model
OP	DATA type	Available device / Description / Range]
		Integer	Erro Can
S	WORD	Channel(Ch1, Ch2)	
		1 to 2	
		C, UW	
S1	WORD	Counter contact to use]
		0 to 65535]
		Integer	
\$2		High speed counter match value for triggering interrupt	
52	WURD	(parameter setting)	
		1 to 3	
		M, D, F, Z, T, Y, C, L, S, UB, 200, 100, 0]
		Output device or interrupt option for the current counting value	
	BIT or	which is counted up to the match value	
U	CONST	(200: up counting→down counting, 100: down counting→up	
		counting, 0: no output)	
		None]
		Integer]
S3	WORD	Output device ON hold time]
		1 to 10000(us), 0: output continues	

<Ladder>

000000	USONT		000004		000	50
٠ ۱	HSCNI	1	C00001	2	200	50
						END
			· · · · · · · · · · · · · · · · · · ·		1	END

High speed counting instruction: While the start signal (M0) is ON, when the high-speed input signal is applied to the input channel (S), word device value of the counter contact (S1) counts by 1. When the device value is counted up to the match value (S2), interrupt is triggered or output bit device is ON during set ON hold time (S3).

X In case of making output pulse through the S3 parameter value, set S3 over 60us



% For more information, refer to High-speed counter of AtLogic user manual.

5.5.235 High speed counter Instruction (HSSET)

High speed counter instruction		HSSET S S1 S2	Apr LP-	olicable model A070, LP-A104
OP	DATA type	Available device / Description / Range		
		Integer	Erro	Step Borr Carr
S	WORD	Channel(Ch1, Ch2)	r	
		1 to 2	\bigcirc	7
		Integer		
		High speed counter setting value		
S1	DWORD	(The value which is set as current counter value at the		
		occurrence of interrupt)		
		0 to 16777215		
		Integer		
52	WORD	High speed counter match value for triggering interrupt		
32	WORD	(parameter setting)		
		1 to 2		

<Ladder>



High speed counter set instruction: While the start signal (M1) is ON, The current counting value is counted up to the match value (S2), the current counting value is set to the high speed counter setting value (S1)

Use with HSCNT instruction.

XOnly activates when the start signal is ON.

<Time chart>



X For more information, refer to High-speed counter of AtLogic user manual.



¦----¦ Scan delay

5.5.236 High-speed Counter Instruction (HSRST)

 $\,\%\,$ For more information, refer to High-speed counter of AtLogic user manual.

Current counting value

-HSRST setting value

6 Appendix

6.1 Error Code and Troubleshooting

(1) Self-diagnosis error code

- LP-S044/LP-S070: UW6540(F0140)
- LP-A070/LP-A104: UW74540(F140)

	Туре	Cause of error
0X0010	Watchdog error	Scan time excesses watchdog timer setting value
0X0020	Memory error	When a certain area of memory is the un- approached state.
0x0021	Battery error	When battery value is below the standard level
0x0022	RTC setting error	Disable to set RTC and RTC operation error
0X0030	Program instruction error	When the program contains instructions that are not able to read and inappropriate forms.
0X0031	Program sequence error	When there is not the instructions required to process the program, such as user defined functions, label name, END, RET and IRET, etc.
0X0040	X0040Parameter setting errorWhen there are some problems in set common and expansion parameters.	
0X0041	Time-driven error	When it operates longer than the given time-driven run-time.
0X0050	Extended module setting error	In case, the hardware constructions are different from previous parameter settings when applying power again and changing the mode.
0X0051	Extended module attaching and removing error	When the extended module is attached or removed in run mode.
0x0060	Communication fail error	When it is received NAK and data format not able to read.
0x0061	Communication format error	When there are some problems occurred in formats (excess of limited range etc.) and CHECK SUM while download and upload.

(2) Motion error code

- LP-S044/LP-S070: UW6420(F20),UW6421(F21)
- LP-A070/LP-A104: UW74420(F20), UW74421(F21)

	Symptom	Run state	Troubleshooting
1	When inputting other starting instruction signal during using channel	Run	Clear the error by MTMEC(removing error) instruction and executes next start instruction
2	When giving progress instruction to other direction than current progressing direction during consecutive running 'C'	Stop	Edit the pattern list, which has problem. Clear the error by MTMEC(removing error) instruction and executes motion operation
3	When setting position preset during running	Run	Clear the error by MTMEC(removing error) instruction
4	When there is no action list to operate during executing pattern action	Stop	Edit the action list, which has problem. Clear the error by MTMEC(removing error) instruction
5	When action list type is position drive during executing pattern action and destination position is out of S/W limit range	Stop	Check and edit action list and S/W limit value, which have problem. Clear the error by MTMEC(removing error) instruction
10	Excess high low limit error	Stop	Clear the error by MTMEC(removing error) instruction and escape limit with jog operation and execute the next
20	When speed parameter value is higher than maximum speed (100,000PPS) Designated pattern number of MTIDM(Indirect designated drive) instruction is out of 1 to 99	Stop	Clear the error by MTMEC(removing error) instruction and check the set parameter values

X1. Be sure that errors related with motion are remained even if restarting LP.



* Dimensions or specifications on this manual are subject to change and some models may be discontinued without notice.