

Innovating Energy Technology



Software Package for Personal Computers SX-Programmer Standard V3 <Reference> Type: NP4H-SWN

Thank you for your selection of Fuji Electric Programmable Controller MICREX-SX Series. This User's Manual explains the details of how to use the MICREX-SX Series Personal computer loader software package SX-Programmer Standard V3. After learning basic operations, use this manual to check the detailed functions. For the basic operations, refer to <Introduction> (FEH597). Also read the related manuals shown below.

Special Notes

- 1) This product cannot read programs created by SX-Programmer Expert (D300win).
- (There is no compatibility with each other.)
- 2) The PLC model names displayed in the loader screen in this manual may have been increased on the loader screen of the latest version according to addition of new models. The company name displayed in the loader screen may have also been changed according to changes in organization structure.

Title	Manual No.	Contents
User's Manual Instructions, MICREX-SX series SPH	FEH588	Explains the memory, language and system definitions of the MICREX-SX series SPH.
User's Manual Hardware, MICREX-SX series SPH	FEH201	Explains the system configuration, hardware specifications and operations of modules in the MICREX-SX series SPH.
User's Manual Instructions, MICREX-SX series SPB (SX-mode) Standard	FEH430	Explains the memory, language and system definitions of the MICREX-SX series SPB.
User's Manual Hardware, MICREX-SX series SPB	FEH401	Explains the system configuration, hardware specifications and operations of units in the MICREX-SX series SPB.
User's Manual Board Controller, MICREX-SX series	FEH423	Explains the system configuration, hardware and software specifications, and operations of the board controller.
User's Manual SX-Programmer Standard V3 <introduction></introduction>	FEH597	Explains basic operation of SX-Programmer Standard V3.
Replacement Manual, MICREX-F with SX <introduction></introduction>	FEH059	Explains the outline and procedure of replacement of MICREX-F series PLC with SX series PLC.

* In addition to the above manuals, the following Fuji Electric Co.,Ltd.site offers various manuals and technical documents associated with MICREX-SX series.

URL http://www.fujielectric.com

Notes

- 1. This manual may not be reproduced in whole or part in any form without prior written approval by the manufacturer.
- 2. The contents of this manual (including specifications) are subject to change without prior notice.
- 3. If you find any ambiguous or incorrect descriptions in this manual, please write them down (along with the manual No. shown on the cover) and contact FUJI.

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Safety Precautions

Be sure to read the "Safety Precautions" thoroughly before using the module.



: Incorrect handling of the device may result in minor injury or physical damage.

Even some items indicated by "Caution" may result in a serious accident. These safety instructions provide important information. Be sure to strictly observe them. The items to be cared most are shown below:

Caution			
	Do not use parts which are found to be damaged or distorted when unpacking the unit because use of such parts may cause failure or malfunction.		
	Do not apply shock to the product by dropping or falling, etc. because to do so may cause damage to or failure of the product.		
	Do not bring a floppy disk close to magnetized objects because magnetism may cause failure. The product CD is a CD-ROM. Never reproduce it using a audio CD player.		
_	Large sound volume may cause damage to the ear or audio equipment.		
	Perform disk check periodically. Use of damaged floppy disk or hard disk may cause failure or malfunction of created data and system.		
	Be sure to attach and lock certainly the connector of the loader cable because failure to do so may cause malfunction.		
	Do not get dust at connectors because dust may cause malfunction or failure.		
	Insert the CD-ROM, loader connector, etc. into the right direction because failure to do so may cause malfunction or failure.		
	Fully check safety before modifying the program during operation, performing forced output, activating or deactivating the equipment, or performing other operations because failure to do so may cause mis-operation resulting in damage to the equipment or accident.		
	Do not turn off the power during loader operation (during access to hard disk or floppy disk, during communication with the PLC) because to do so may cause loss of data, failure or malfunction of the product, damage to the equipment, or accident.		
	Use the equipment in a software operation environment described in the manual because failure to do so may cause failure or malfunction.		
	Upgrade the software according to descriptions in the manual.		
	When unplugging the loader cable or power cable, do not hold the cord because to do so may cause failure or malfunction.		
	Operate the loader in a stable place where there is no risk of dropping because failure to do so may cause accident. When discarding this product, handle it as industrial waste.		

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* The manual No. is printed at the bottom right of the cover of this manual.

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1-1 Special Notes

(1) There is no compatibility with SX-Programmer Expert (D300win).

Projects created by SX-Programmer Expert (D300win) can be read neither by SX-Programmer Standard (this loader) nor from the MICREX-SX main unit. When online connection to SX_CPU created by D300win is made, an error message appears.



(2) Cautions in creating, changing or loading a project

In the MICREX-SX series, a PLC program created by a user is called a "project." A project consists of "system definition" and "program (user application)" as shown in the figure below.

Project	
System definition	 Module registration CPU memory size CPU running definition etc.
Program	 Program User FB (function block) User function

In the system definition, modules and the memory size of the CPU are registered, which are closely related to addresses that are used in the program. When downloading a project, the program must match the system definition. Therefore, when downloading a new project to the PLC, be sure to download the program and system definition at the same time and reset the system.

	Load to PLC
	Program
Be sure to check both.	Cl <u>e</u> ar retain memory area
	Cle <u>a</u> r FB/SFB variables
	System definition
	ZipFile
	✓ Zip file
	✓ Program name
	🗹 Iag
	✓ Line comment
	✓ System Configuration
	Tag Project
	<u>F</u> B Parameter data
	Module driver
	Load to PLC Close

<Steps to follow in changing a project>

Operation	Step to follow
Changing both system definition and program	Download both the system definition and program, and reset the PLC system.
Changing system definition only	Download both the system definition and program, and reset the PLC system.
Changing program only	Download the program, and start the PLC system.

Note: Changing "no equipment" setting of a module in the module registration is also regarded as a change of system definition.

(3) Cautions in uploading a program that includes an expansion FB

When uploading a program that includes an expansion FB provided by Fuji Electric (FBs beginning with "_" such as _C_free and _MHCNTR), you need to download the expansion FBs to the computer that is used for upload in advance.

You can install the standard expansion FBs using the installation CD of Standard. Or alternatively, you can obtain the data for installation from Fuji Electric website (Fe Library).

If a program includes an expansion FB, the following dialog box appears. Click the [Yes] button to import the expansion FB.



If no expansion FBs have been downloaded in the computer, the following message appears.



In this case, the program can be uploaded, however, the expansion FB has no contents. If you execute [Conversion] menu > [Conversion All]. an error occurs. Click [Project] menu > [Import] > [Program] to import the expansion FBs manually. For CSV interface FB and PID FB in which a structure is used, you also need to import structure definition. Click [Project] menu > [Import] > [Array/Structure] to import array definition.

1-2 Basic Connection Configuration

You can use a computer as a program loader for MICREX-SX Series by installing this software in it.

1-2-1 Connecting to SPH Series



MICREX-SX SPH series

1-2-2 Connecting to SPB Series



MICREX-SX SPB series / Board controller

Note: To use the SPB in SX-mode, the software version of the SPB must be V**. 10 or later.

1-3 Installation

1-3-1 Personal computer operating environment required for Standard loader

Item	Specification				
Personal computer	IBM-AT compatible equipment				
CPU	Intel Pentium III 800MHz or higher (2GHz or more is recommended.)				
Hard disk	200 MB or more				
CD-ROM drive	Required at the time of installation (quadruple speed or more is recommended.)				
Memory capacity	512MB or more (1GB or more is recommend.)				
Mouse	At least one of USB mouse, serial mouse, bus mouse, and PS2 mouse is supported.				
Keyboard	106 keyboard				
Display	Resolution: 1024 x 768 dots or more				
Operating system (Note 1)	Any of the following Microsoft Windows -Microsoft Windows 2000 -Microsoft Windows XP (32 bits) -Microsoft Windows Vista (32 bits) -Microsoft Windows 7 (32 bits): Supported by V3.0.3.34 -Microsoft Windows 7 (64 bits): Supported by V3.0.4.10 -Microsoft Windows 8 (64 bits): Supported by V3.0.9.10				
Other software (Note 2)	Microsoft Internet Explorer version 5.01 or later Microsoft.NET Framework2.0 runtime library Microsoft.NET Framework English Language pack 2.0 Adobe Reader				

Note 1: Update the OS to the latest version (adjustment of Service Pack etc.)

Note 2: .NET Framework is necessary to use the "failure analysis" function.

It is contained in the product CD-ROM.

For Windows 8, ".NET Framework3.5" is also necessary. Download and install it from the following Microsoft website. https://msdn.microsoft.com/en-US/aa496123

Note 3: With Windows XP/Vista/7/8, users who have no administrator's privilege can not access any folder that requires administrator's privilege. When multiple users may use the same computer, Standard loader should be installed in a folder that can be read, written or deleted by any account other than administrator's privilege.

Note 4: With Windows 8, the touch monitor cannot be used. Use a mouse.

1-3-2 Installation

Standard loader is provided in a CD-ROM that includes the installation program. When you insert the CD-ROM into the CD-ROM drive with the personal computer turned ON, the following screen appears automatically.

<Notes on installation>

Note 1: If [.NET Framework2.0] has not been installed in the destination personal computer, [.NET Framework2.0] is automatically installed.

It takes a few minutes or sometimes more than ten minutes to install [.NET Framework2.0].

(The time required for installation depends on the performance of the personal computer used.)

- Note 2: If the installation screen does not appear after inserting the CD-ROM, click the [Start] button of Windows, select [Run], enter "x:\autorun.exe" (x indicates the drive into which the CD-ROM is inserted), and then click the [OK] button.
- Note 3: If Standard V2 has already been installed and started, finish it before installation.
- Click "Install the English version."

 SX-Programmer Standard	X
日本語版をインストール	
Install the English version	
安装中文版本	

Section 1 Overview

Click "Standard V3 Setup."



<FYI>

"FLEX-PC(Standard V2) Setup":

Software for StandardV2 (MICREX-SX series) and FLEX-PC (NB/NJ/NS series PLC, SPB N mode) For the details of StandardV2 loader operations, refer to the user's manual FEH590. For the details of FLEX-PC loader operations, refer to the user's manual FEH403.

"MICREX-F PLC Programmer Setup": Software for MICREX-F series PLC

For the details of loader operations, refer to the user's manual FEH147.

• On the following screen, click "Standard V3" to start installation. Follow the direction that appears on the screen.



* "Standard V3 (Monitor)" is a monitoring tool for maintenance people. This software cannot change a program. When installing StandardV3 into Windows2000 computer, execute "Windows Installer 3.1 Setup" on the screen above before installing StandardV3.

1-4 Difference between old and new versions

1-4-1 Difference of file's compatibility between old and new versions

This subsection explains the compatibility with the old version of standard loader (V2) The followings are the main points.

<Offline Project>

"Offline Project" corresponds to the project files saved in computer.

• The project files created by V2 can be opened by V3.

The project files created by or saved in V3 cannot be opened by V2. The following lists the extensions of files.

	Compressed file	Non-compressed file
V2	Zpj	Spj
V3	Zpj3	Spj3 (Note 1)

Note1: If you check "Support non compressed project file" in [Options] setting, this extension is effective.

• You can newly create a user function (FCT) in V2, however not in V3. Functions created in V2 can be opened and edited in V3. When creating a new document, substitute FBs (function blocks).

<Online Project>

"Online Project" corresponds to project files saved in the PLC.

- A project created by V2 and transferred to the PLC can be read by V3.
- A project created by V3 and transferred to the PLC cannot be read by V2. However, if the project uses a new editing function of V3, the display on V2 is as shown below.
- 1) The number of condition contacts before word instructions

The number of condition contacts that can be described in a word instruction is seven on V2 and nine on V3 at the maximum. If you create a circuit that has more than seven condition contacts in a word instruction by V3 and load it to the PLC, the circuit automatically becomes a returning line when read by V2.



Read the circuit by V2

2) Condition contact before user FB

You can write a condition contact before a user FB in V3, however cannot in V2. If a circuit that has condition contacts before a user FB is read from PLC by V2, the circuit causes an error. The program (POU) including such a circuit cannot be transfered to the PLC by V2. Use V3.



1-4-2 Main difference of function between old and new versions

This subsection explains the difference of the function between old and new versions of Standard loader. The followings is the main point.

(1) The number of project files that can be opened at the same time

You can open multiple project files in the old version (V2), however, can open only one project file in the new version (V3). When you need to open multiple files at a time, startup several pieces of loader software.

1-5 Configuration of Loader Screen

1-5-1 Screen configuration elements

This subsection explains configuration elements of the loader screen.

The the loader screen mainly consists of the main menu bar, tool bar, instruction jog bar, project view window, document window and each message windows.



Status bar	
------------	--

Name	Function detail			
Main menu bar	This bar is used to perform main operations to the loader.			
Tool bar	commands used frequently in the main menu are registered as icons.			
Instruction jog bar	This bar is used to switch the instruction group and choose an instruction for the chosen group.			
Project view window	This window structurally displays each constructing element of a project (system definition, program, and device).			
Document window	This window is a space to display a program and a data worksheet.			
Message window	This window displays messages, for example, program information, conversion error information, cross reference. You can change the arrangement by using your mouse and display multiple windows side by side.			
Status bar	This bar displays messages about the type of PLC, program usage, PLC status, and other supplemental information depending on the situation.			

1-5-2 Changing screen layout

You can change the layout of document window, message window and project window following the procedure below.

(1) Displaying a program and data monitor screen on the document window at the same time.

To display a program, double-click the program instance under the program folder in the project view. To display data monitor screen, click [Online] menu > [Data monitor] > [Data monitor]. To switch the display between the program and data, click the tab that you want to display.





To display a program and data one above the other, click and hold down the left mouse button on the "Data monitor 1" tab. The "Docking indicator" appears. The screen is reversely displayed.



While holding down the left mouse button, move the mouse pointer to the lower button of "Docking indicator." The lower half of the screen is reversely displayed. (The contents of the selected tab will appear on the reversely displayed part.)

Ladder1	Data Monitor 1						▼ X
i 🦛 🚛 🗙	💘 4 4 4 4		- <none></none>	- 🖬	en 🖷 🐂		
Address	Tag	0	F	0	DEC	HEX DATA	<u>م</u>
					Move the m	ouse pointer here.	
1							

• Release the mouse button, and the "Data monitor 1" worksheet is displayed on the lower half of the screen. (Docking display)



* Function of each button on "Docking indicator."



(2) Adjusting the layout of message windows

To display a message window,click [View] menu > [Message window], and then select an arbitrary message window. Open message windows are displayed as a list at the bottom left of the screen.

🛃 SX-Programm	ner Standard (Prot	otype)									<u>_ 8 ></u>
Eile Edit Vi	ew <u>P</u> roject <u>O</u> nli	ne <u>C</u> onversion <u>T</u> ools <u>W</u> ind	low <u>H</u> elp								
i 🛅 • 📂 • 🔛	🖪 🗳 🐰 🗈	(品) AA り や 田 富 ・	5 🛐 100%	Ŧ							
. 🔜 📖 📖 🗉		🖻 🖷 🗛 🐅 🏷 🖪 🖂	100								
Instruction Jog		,									д >
Contact/Output(1)	F2	<u>F3</u> F4 F5	()(S) F6 F7	– <u>–(R)–</u> F8	USERFB Guid	ance 10					
Project View	- ↓ ×	Ladder1*									• ×
Project 'Manua	l_Intro_A74'	x1.c									
E- Resource (CPU0): NP1P5-74	1 -] [MOVE	DX1.2	DM40
🖻 🚞 Progra	ms										
E- 🚺 Del	fault: Default	2							TON	T1	2000ms -
	Ladder2: (2)	TimerO								Timer 0	
	Ladder1_0: (3)	T1 M0									MO
	Programs	3 J L J L									
Ladder	0: (0)	T1 MO						8	When the F1 key i	s pushed, the guidan	ce is displayed.
LD3: (4	F)										►
e Function Bi	I)	Data Monitor 1									- ×
📴 bbb: (3	3)	G I X X I A A			- <nc< td=""><td>ine></td><td>-</td><td></td><td></td><td></td><td></td></nc<>	ine>	-				
CCC: (2))	Address Tan		0 8	''	n	DEC	F			-
Array/suru	u l	X1.C				0			0	1	_
		DX1.2	000	0000 0000 00	00 0000 00	00 0000	0	000000	0 0 0		
		1									
Information											₽ >
	Program Name	Program Type	Step	User FB	Edge	Counter	Timer	Add up timer	Other FB		
Resource											
	Ladder1	Program	82 step	0	0	1	1	0	0		
	Ladder2	Program	61 step	0	0	0	0	0	0		
	Ladder1_0	Program	60 step	3	0	0	1	0	0		
	aaa	Function Block	26 step	0	0	0	0	0	0		
	bbb	Function Block	26 step	0	0	0	0	0	0		
	CCC	Function Block	26 step	0	0	0	0	0	0		
Total		Function : 0 Function block : 3	281 step		0	1	2	0	0		
Error Rood	lition Monitor	tout Toformation To Cross P	eference								
Error : 0. Warning											
citor, o, warning											
		\backslash									

Message window list

Click and hold down the left mouse button on an arbitrary item of the message list. The "Docking indicator" appears, and the screen is reversely displayed. The following procedure is the same as that of the screen layout change of the project view window.





1-5-3 Auto-slide function

The auto-slide function can be set for the project window or device monitor window. If the auto-slide function is enabled, the window automatically shows and hides according to the mouse pointer position.





Move the mouse pointer out of the window to hide it automatically.

ਆSX-Programmer Standard - 71」71/诗入編_A48E [Ladder3]									
<u>Eile E</u> dit <u>V</u> iew <u>P</u> roject <u>O</u> nline	<u>C</u> onversion <u>T</u> ools <u>W</u> indow <u>H</u> elp								
i 🖂 📬 i 🌫 😏 🔏 i 🚳 🗳	💁 💑 🏷 🖼 🗄 💷 💷 📮 🧐 🕨 📑 🛃 🛤 Auto								
Project View 👻	ъх <mark>і</mark>								
	H↑F →↓F -()(S)(R)- USERFE								
Resource (CPU0): NP 1PM-48E									
Programs									
	22 H000007~								
Ladder 3: (5)									
ST1: (6)									
Unassigned Programs	•								
Function Blocks									
aaa: (0)									
ccc: (2)									
Panel0									
Array/Struct									
	4								
	۴								
	U.IN								

The auto-slide function is disabled by default. To enable this function, use the push-pin icon at the top left of the window as described below.



If you move the mouse pointer on the project view icon, the project window automatically shows.

🌱 Projec	Contact/O	utput(1) 🛟	-] [- F2	-] [²]1 F3 F	1	-()- F6	-(S)- F7
st Vie	Ladde	r0 Ladder1	Ladder	3			
Mi	1	м20	>=AW	DM22	H000007	~}	
	2	M21					
	3						

This section explains all the functions that can be used from the main menu shown below.

- File menu ⇒ File processing commands
- View menu ⇒ Program window display mode setting functions
- Project menu ⇒ Project editing functions
- Online menu
 ⇒ Online functions
- Conversion menu
 Program conversion and check functions
- Window menu
 ⇒ Window display options

2-1 File Menu

The "File" menu contains the following commands:

- New project ⇔ Opens a new project file.
- Based on an existing project ⇒ Creates a new project based on an existing project.
- Close ⇒ Closes the open project.
- Save ⇒ Overwrites the open project window.
- Save As ⇒ Saves the current project with a filename.
- Page Setup ⇒ Sets up the page format for printing.
- Print Preview ⇒ Displays the print preview in the screen.
- Resent Projects ⇒ Displays the recently used project.
- Create Short Cut \Rightarrow Creates a shortcut to start up the loader software and open a project file at the same time.
- Exit ⇒ Exits the loader.

2-1-1 File Menu - New project

This command is used to open a new file.

◆ Click [File] menu > [New project]. The following dialog box opens. To change the display mode, click the [Display switch] button, and then select "Large icon" or "Small icon" mode.

M- J-1 .				C			isplay switch	
Model :								
NP1PU2-256E	100 NP1PU2-048E	100 NP1PU-256	E NP1F	PU-128E				
NP 1PU-048E	NP 1PU-048CE	:						
SPH2000								
100 NP1PM-256H	100 NP1PM-256E	NP1PM-48F	R NP1	PM-48E				
SPH300					•			
			ОК	Cance				
					///			
mall icon mod ••• Project	e>	$\overline{\bigcirc}$			//			
mall icon mod w Project Model :	e>	$\overline{\Box}$			×			
mall icon mod w Project Model : SPH3000 INP1PU2-2561 SPH2000 INP1PM-256H SPH2000	e>	NP 1PU-256E	NP 1PL	J-128E 1-48E				
mall icon mod w Project Model : SPH3000 NP1PU2-2561 NP1PU-048E SPH2000 NP1PM-256H SPH300 NP1PS-245 SPH200	e>	 NP1PU-256E NP1PM-48R NP1PS-74 	INP 1PL	J-128E 1-48E :-32				
mall icon mod w Project Model : SPH3000 NP1PU2-2561 SPH2000 NP1PM-256H SPH300 NP1PS-245 SPH200 NP1PH-16 SPM3000	e>	 NP 1PU-256E NP 1PM-48R NP 1PS-74 	NP 1PL NP 1PL NP 1PN NP 1PS	J-128E 1-48E :-32				
mall icon mod w Project Model : SPH3000 INP1PU-256H SPH2000 NP1PM-256H SPH300 NP1PS-245 SPH200 NP1PH-16 SPM3000 NP0PU-048R SPM2000	e>	NP 1PU-256E NP 1PM-48R NP 1PS-74	NP 1PL NP 1PL NP 1PN NP 1PN	J-128E 1-48E :-32				

♦ Select the type of a CPU and click the [OK] button to create a new project.

2-1-2 File Menu - Based on an existing project

This command is used to create a new project based on an existing project. An existing project is opened as a new project file. (Therefore, the existing project is not affected.)

 Click [File] menu > [Based on an existing project]. The following dialog box opens. On this dialog box, select a file type and a project file to open.
 When you select a file and click the [Open] button, the project opens in offline mode.

Based on an ex	isting project					? 🔀
Look jn:	🗀 PLC_Program		~	G 🦻	📂 🛄 -	
My Recent Documents Desktop	Example1.zpj3					
My Documents						
My Computer						
	File <u>n</u> ame:	Example1.zpj3			*	<u>O</u> pen
My Network	Files of <u>type</u> :	Project Files (*.zpj3) Project Files (*.zpj2)			~	Cancel
		V2.x Project Files (*.zpj; *.spj) Template Files (*.sxt)				

<Type of file>

Type of file (extension)	Usage
V3 zipped Project (*.Zpj3)	V3 zipped project file.
V3 unzipped project (*.Spj3)	V3 project file, which consists of multiple files and folders. When you open a file, specify this project file. To make this type available, perform option setting.
V2 zipped Project (*.Zpj)	V2 zipped project file.
V2 unzipped project (*.Spj)	V2 project file, which consists of multiple files and folders. When you open a file, specify this project file.
SX Template (*.Sxt)	Template type for V2 project.

2-1-3 File Menu - Open

This command is used to open an existing project file.

- * Only one file can be opened at the same time. To open multiple projects in a computer at the same time, start up multiple pieces of loader software and open project files in each software.
- Click [File] menu > [Open]. The following dialog box opens.
 On this dialog box, select a file type and a project file to open.
 When you select a file and click the [Open] button, the project opens in offline mode.

Open Project							? 🗙
Look jn:	🚞 PLC_Program		*	6	1 10 1	•	
My Recent Documents	Example1.zpj3						
Desktop							
My Documents							
My Computer							
	File <u>n</u> ame:	Example1.zpj3			~	(<u>O</u> pen
My Network	Files of <u>type</u> :	Project Files (*.zpj3)			~	(Cancel
		V2.x Project Files (2p(3) V2.x Project Files (*.zpj; *.spj) MICREX-F Program Files (*.ld;	x)				

<Type of file>

Type of file (extension)	Usage
V3 zipped Project (*.Zpj3)	V3 zipped project file.
V3 unzipped project (*.Spj3)	V3 project file, which consists of multiple files and folders. When you open a file, specify this project file. To make this type available, perform option setting.
V2 zipped Project (*.Zpj)	V2 zipped project file.
V2 unzipped project (*.Spj)	V2 project file, which consists of multiple files and folders. When you open a file, specify this project file.
MICREX-F program (*.Ldx)	MICREX-F program file. If you select this file, Standard loader automatically converts the project to SX.
FLEX-PC program (*.Fxl)	FLEX-PC program file. If you select this file, Standard loader automatically converts the project to SX.
FUJILOG-UK program (*.Prj)	Fujilog-uk (or uK-mini) program file. A program can be loaded from FUJILOG-uK (or uK-mini) and saved as a file using "FUJILOG utility" software supplied with StandardV3. If you select this file, Standard loader automatically converts the project to SX.
FLEX-PC (T type) program (*.Pma)	FLEX-PC (T type) program file. A program can be loaded from a T-type CPU and saved as a file using MS-DOS version T-type loader or "WinFN-T" loader by SINWA Electric Corporation. If you select this file, Standard loader automatically converts the project to SX.

2-1-4 File Menu - Close

This command is used to close an opened project file.

◆ Click [File] menu > [Close]. The currently opened project is closed.

2-1-5 File Menu - Save

This command is used to overwrite the contents of the currently open project.

When the project is newly created or loaded online, it has no project name. In this case, the "Save As" dialog box appears to save with a name.

(Refer to "2-1-6 File Menu - Save As.")

2-1-6 File Menu - Save As

This command is used to save the currently open project with a name.

- Click [File] menu > [Save As]. The following dialog box opens.
 Select a folder, enter a file name, and then click the [Save] button to save the project file.
- Note: The file name can be up to 32 byte characters. Symbols ':', '.', '*', '?', '"', '<', '>', '|' cannot be used for the file name. Space characters cannot be used, either.

Save As								? 🔀
Save jn:	🚞 PLC_Program		~	G	1	ø	•	
My Recent Documents	🖬 Example1.zpj3							
Desktop								
My Documents								
My Computer								
	File <u>n</u> ame:	Example2				~		<u>S</u> ave
My Network	Save as <u>t</u> ype:	Project Files (*.zpj3)				*		Cancel

2-1-7 File Menu - Page Setup

This command is used to perform all settings about printing in the page setting dialog box.

2-1-8 File Menu - Print

This command is used to open the print menu dialog box.

2-1-9 File Menu - Print preview

This command is used to open print preview dialog box.

* For more details of the print function, refer to Section 4.

2-1-10 File Menu - Recent Project

This command is used to display up to 10 projects that you have most recently used since the loader software was installed. The projects are listed in the order in which they were used. When you open a project on the list, the file name is listed as the latest.

• Click [File] menu > [Recent Projects]. The recent project history is displayed as a list. Click a project from the list to open it.

1	II s>	K-Programmer Standard	d – Intr	odu	ction_/	474a [.D2]								
	<u>F</u> ile	<u>E</u> dit <u>V</u> iew <u>P</u> roject <u>C</u>	<u>D</u> nline	<u>C</u> onv	ersion	<u>T</u> ools	<u>W</u> indow	<u>H</u> elp							
1	61	<u>N</u> ew project Ctrl-	+N	AL - 5	Mo 10			Ð 🕨 📑	: 🟹 📖	📷 Auto	- 1	🖥 • 📂 •			K 🗈 🛙
		Based on an existing project	t						,		,,,				
I	2	Open Ctrl	+0	-	<u>}</u> ↑[—	⊣↓⊢	-()-	-(5)	-(R)-	USERFB	Guidance				
		<u>C</u> lose			F4	F5	F6	F7	F8	F9	F10				
		Save Ctrl	I+S	adde	r0 LI	D1 LD3	LD2								
ľ		- Save <u>A</u> s		1 M	ain pr	cogram 1									
				2											MOVE
	(II)	Prage Deligip	LD												11012
		Erint Otri	ITE		L1									4	DI
	9	Frint Frevie <u>w</u>		3] [*	DL
		Recent Projects	· •		1 C:¥P	rogram Fil	es¥Fuji Ele	ctric¥SX-Pr	ogrammer S	tandard¥Pl	.C_Program_	Eng¥Introdu	ction_A7	4a.zpj3(<u>1</u>)	
		E <u>x</u> it			2 C:¥P	rogram Fi	es¥Fuji Ele	ctric¥SX-Pr	ogrammer S	tandard¥Pl	.C_Program_	Eng¥UserFE	3_exampl	le.zpj3(<u>2</u>)	
Ľ		Unassigned Programs			3 C:¥P	rogram Fil	es¥Fuji Ele	ctric¥SX-Pro	o <mark>grammer</mark> S	tandard¥Pl	.C_Program_	Eng¥ST_exa	mple_74.	zpj3(<u>3</u>)	
		Function Blocks			4 C:¥P	rogram Fil	es¥Fuji Ele	ctric¥SX-Pro	ogrammer S	tandard¥Pl	.C_Program_	Eng¥Simulat	tion_AFE	3_jp.zpj3(<u>4</u>)	

♦ Alternatively, you can open the recent project by clicking the drop-down list beside the "open folder" icon.

🕅 sx-	Prog	ramme	r Standa	rd – In	troductio	n_A74a	[L D2]	
<u>F</u> ile	<u>E</u> dit	⊻iew	<u>P</u> roject	<u>O</u> nline	<u>C</u> onversio	n <u>T</u> ools	<u>W</u> indow	<u>H</u> elp
: 🛅 -	-		3 💁 3	6 🗅 🕻	L (#A 🛩	0 (*)		Mo
Instruction		1 C:¥Pr	ogram File	s¥Fuji El	ectric¥SX-F	⁾ rogrammer	Standard¥P	'LC_Program
Contact/		2 C:¥Pr	ogram File	s¥Fuji El	ectric¥SX-F	⁾ rogrammer	Standard¥P	LC_Program
D · · · ·		3 C:¥Pr	ogram File	s¥Fuji El	ectric¥SX-F	⁾ rogrammer	Standard¥P	'LC_Program
Project V		4 C:¥Pr	ogram File	s¥Fuji El	ectric¥SX-F	rogrammer	Standard¥P	'LC_Program
		5 C:¥Pr	ogram File	s¥Fuji El	ectric¥SX-F	rogrammer	Standard¥P	'LC_Program
🖨 🧰 F		6 C:¥Pr	ogram File	s¥Fuji El	ectric¥SX-F	rogrammer	Standard¥P	LC Program
2-1-11 File Menu - Create Short Cut

This command is used to create a shortcut to start up the loader software and open a project file at the same time.

CreateShortCut	×
Destination: C:\Users\user\Desktop	<u>B</u> rowse
Include the communication setting.	
Set the read-only attribute.	
Load from PLC	
Destination: CPU0	
Load in Zip File	
⊙ <u>Zip</u> File	
C Tag Project	
C Project	Bro <u>w</u> se
ок	Cancel

<Options>

• Include the communication setting:

Creates a shortcut file that includes information on the communication setting set in the loader.

- Set the read-only attribute:
 - Specifies the attribute of the shortcut file as "read-only."
- Load from PLC:
- When this option is unchecked, a project in the loader is read. When checked, a program in the PLC is read.
- Destination: Select the CPU No. of the PLC. For a single CPU system, select CPU 0. For a multi-CPU system, select a destination CPU.
 Load in Zip File:
 - Reads a zip file at the same time when reading a program. A zip file includes information such as tags. You can select any of the following three options.
 - Zip File: Reads a zip file in the PLC.
 - Tag Project: Reads a tag project in the PLC.
 - Project: Reads the tags that a project in the loader includes. Click the [Browse] button to select a project in the loader.

2-1-12 File Menu - Exit

This command exits the loader software.

2-2 Edit Menu

The "Edit" menu contains the following commands.

- Cut ⇒ Moves a selected circuit to the clip board.
- Copy ⇒ Copies a selected circuit to the clip board.
- Find ⇒ Searches for an address or a tag for the active program.
- Go to ⇒ Moves to a specified line or section number.
- Insert Row ⇒ Inserts a row above the cursor position.
- Delete Row ⇒ Deletes the row on the cursor position.
- Insert Column \Rightarrow Inserts a column above the cursor position.
- Delete Column \Rightarrow Deletes the column on the cursor position.
- Insert Returning ⇒ Inserts a return of a line.
- Instruction List ⇒ Displays the currently using mnemonics.
- Multi operation input wizard ⇒ Used for multiple numeric data operation in ST language.
- Split Program ⇒ Splits a program into two programs.
- Open Device Editor ⇒ Opens the screen to edit tags of the memory devices such as M, L, X, and Y in a batch and check the use status of the devices. You can also open this screen by double-clicking the "Device" icon in the project view. For more details, refer to "Appendix 8-2 Device."
- Copy to ladder library ⇒ Saves a part of the program as a library.
- Paste from ladder library ⇒ Opens and pastes a library program on the currently created program.
- Book marks ⇔ Sets book marks on the program.
- Grid ⇒ Sets the grid line on the simulation panel.

2-2-1 Edit Menu - Undo / Redo

(1) Undo

This command is used to cancel the editing operation performed last.

Click [Edit] menu > [Undo]. The system is restored to the status that took effect just before the last editing operation. Alternatively you can execute this function with the [Undo] button on the main tool bar or pressing the <Ctrl> + <Z> keys.

(2) Redo

This command has the opposite function of the [Undo] command in [Edit] menu.

- Click [Edit] menu > [Redo]. The system is restored to the status that took effect just before the last editing operation. Alternatively you can execute this function with the [Redo] button on the main tool bar or pressing the <Ctrl> + <Y> keys.
- * The operation history is deleted when you close the project file or change the PLC model.

2-2-2 Edit Menu - Cut / Copy / Paste

These commands are used to perform "cut," "copy," and "paste" operations in units of programs (instances) or ciurcuits.

<"Cut" or "Copy" of a program>

- ◆ Select a program instance in the project view, and then click [Edit] menu > [Cut] or [Copy.].
- Alternatively, you can execute "cut" or "copy" with the right-click menu or the following shortcut keys, <Ctrl> + <X> for cut and <Ctrl> + <C> for copy.



<"Paste" of a program>

- ◆ Select a program instance in the project view, and then click [Edit] menu > [Paste].
- Alternatively, you can execute "paste" with the right-click menu or the shortcut key, <Ctrl> + <X>.



* For more details of "Cut," "Copy," and "Paste" of a circuit, refer to FEH597 "2-4-2 Cutting, copying, and pasting a circuit."

2-2-3 Edit Menu - Find

(1) Find - Find / Find Output Device / Next in the Find command

These commands are used to search for a specified address or tag for the active program.

Click [Edit] menu > [Find] > [Find].

Alternatively, you can execute this function with the shortcut key, $\langle Ctrl \rangle + \langle F \rangle$ or the "Find button" icon \mathbb{A} . The "Find Device" dialog box opens.



<Options>

• Find what:

Enter an address or a tag name to find. If you execute the "Find" command while selecting a contact or a coil, the address is automatically entered. You can search for an address by specifying the range such as "M0-M10." To search for a page by SECTION instruction, enter Nxxx (xxx = section No.)

• Look in:

Choose "Active Program" or "All Programs."

"Active Program": Searches the currently open program.

- "All Programs": Searches all programs.
- Origin:

Choose "Entire Scope" or "From Cursor. This option is enabled when "Active Program" is selected for "Look in." "Entire Scope": Searches from the top of the currently open program

- "From Cursor": Searches from the current position.
- Search up:

Scrolls up from the current cursor position to search. When this option is unchecked, it scrolls down to search.

This option is enabled when "Active Program" is selected for "Look in."

• Find the overlapped device in bit/ word:

The scope of search includes the bit/ word/double-word devices that has the specified address.

For example, when you enter M0 (bit) in the "Find what" box, the scope of search includes WM0 (word), DM0 (double word) including M0.

When you enter WM0 (word) in the "Find what" box, the scope of search includes M0 to MF (bit), DM0 (double word).

• Find the area of block transfer instructions:

The scope of search includes data with many words such as the area of block transfer instructions.

This option can is enabled only when word/ double word is entered in the "Find what" box.

• Find output device:

The scope of search is only the devices used as an output instruction (coil or forwarding destination of transfer instruction). • Report find result window:

This option is enabled when "All Programs" is selected for "Look in." When the search is complete, the "Find Result" window opens on the lower side of the screen.

If "Clear Previous Report" is checked, the previous search results are cleared and only the latest result is displayed.

When the entered address is found, the line is displayed by scrolling it to the top of the program window. The "Find Device" dialog box is automatically folded and moved to outside of the project view window.



- ♦ [Edit] menu > [Find] > [Find Output Device] command is used to search only output devices. The same operation is performed when you execute [Edit] menu > [Find] > [Find] and select "Find Output Device."
- ◆ [Edit] menu > [Find] > [Next] command is used to search the next address after executing the "Find" command.

(2) Find - Find Instruction

This command is used to search for a specified instruction.

- Click [Edit] menu > [Find] > [Find Instruction].
 - The "Find Instruction" dialog box opens.

Enter an instruction in the "Find what" box or select an instruction from "Assortment" and "Instruction List," and click the [Find] button.

If "Clear Previous Report" is checked, the previous search results are cleared and only the latest result is displayed.



♦ When the search is complete, the "Find Result" message window appears.

🔡 SX-Programmer Standard (Pro	totype)	[Ladder(0]													
File Edit View Project Or	nline C	Ionversion	Tools	Windo	w Help											
🛅 • 📂 • 🔛 🎒 🖾 🐰 🗈	6 14	9 10 18		÷ 4	Aut	to •	-									
	1 623 6	1 14 Min	1° 😽	🖂	23											
Instruction Jog															ť	φ×
Contact/Output(1) +	∃ Ë− F3	_]↑[_]↓[-()— — F6	(S)— · F7	-(R)- USERF F8 F9	B Guidance F10								
Project View 👻 🗣 🗙	La	adder0*	Ladder1	Lac	dder2										-	×
Project '123' System Definition System Definition Programs Ladder1 (1) Ladder1 (1) Ladder1 (1) Ladder1 (1) Ladder1 (2) Ladder1 (2)	3	Y2.8 JE OUT8 X1.2 IN2 TO TIMERO			Find Instr	uction							TON	TO TIMERO	5000ms Y2.9 () OUT9	
Array/Struct				_	Find what	:	TON		•	Find	Clos	:e				
Find Result Find Result Find Instruction "TON", All Programs Ledder0(2) TON TO 5000ms Matching devices: 1 Matching progra	rms: 1				Assortme All Contact Program Transfer Convers Logical Compar String Time Time/ System Others	ent: //Output r ic icon e e icounter FB	Instruction Lis Instruction TAN TBI TMR TOF TON TP TRUNC_DI TRUNC_I TRUNC_U UDI TO R	t: Descripti Calculate Get stata The time The outp The ou	ion = the tang as at spec r signal is put signal integer con 12 bit unsigned integer dint signed int	ent fied position used to count s set Off wher s set On wher s output until er conversion wersion and to gned integer conver eger to real co	the integrate n the timer re n the timer re reaching the runcate fracti conversion an son and trun onversion		is pushed	, the guidance	e is displayed.	↓ ↓ ×
	Dou to c	uble-cli display	ick on the c	the orre	list of spond	the fir	nd result struction.]] .::

2-2-4 Edit Menu - Replace

This command is used to replace an address.

◆ Click [Edit] menu > [Replace]. The "Replace Device" dialog box opens.

Replace Device			×
Fi <u>n</u> d what:	×1.0	▼ <u>F</u> ind	Close
Replace with:	X1.7	▼ <u>R</u> eplace	Replace <u>A</u> ll
Look in: Origin: ✓ Find the jr ✓ Replace w	Active Program From Cursor mernal bit/word address ith tag D / NC contacts	n Search <u>u</u> p	

<Options>

• Find what:

Enter an address or a tag name to replace. If you execute the "Replace" command while selecting a contact or a coil, the address is automatically entered. You can search for an address by specifying the range such as "M0-M10."

Replace:

Enter an address with which the found address is replaced. If you specify the range, only the starting address is specified here.

Look in:

Choose "Active program" or "All Program."

"Active Program": Searches in the currently open program.

"All Programs": Searches in whole program.

• Origin:

Choose "Entire Scope" or "From Cursor."

"Entire Scope": Replaces from the top of the program in the currently open program.

"From Cursor": Replaces from the current cursor position.

· Search up:

Scrolls up from the current cursor position to replace. If this option is unchecked, it scrolls down to replace. This option is enabled when "Active Program" is selected for "Look in."

• Find the internal bit/ word address:

When you specify a word/double-word address as a replacement device, the scope of replacement includes bit/ word devices including the word/double-word device.

For example, when you enter WM0 (word) in the [Find what] dialog box, the scope of replacement includes M0 to MF. When you enter DM0 (double word) in the "Find what" dialog box, the scope of replacement includes M0 to M1F (bit), WM0 to WM1 (word).

· Replace with tag:

When the address is replaced, the tag is also replaced at the same time.

Change NO/NC contacts:

Switches NO and NC of the specified address.

<Buttons>

• Find:

This button is used to replace with confirming the corresponding address to replace one-by-one. Click this button to search for the corresponding address to replace. Also when you do not replace the found address and move to the next, click this button.

• Replace:

When you click this button while the cursor is put on the found address, the replacement is executed.

Close:

This button closes the dialog box.

Replace All:

This button replaces the addresses in a batch. This button is enabled only when the scope of search is "Active Program."

2-2-5 Edit Menu - Go to - Go to Line / Go to Section

These commands are used to jump the cursor to a specified line or section instruction in a currently active program.

◆ Click [Edit] menu > [Go to Line].

The following dialog box opens. Enter a line number, and then click the [OK] button. The cursor jumps to the specified line.





Go to Line	X
Line Number (1 - 1	10):
	Cancel
	Lancel



2-2-6 Edit Menu - Insert Row / Delete Row, Insert Column / Delete Column

Insert Row ⇒ This command is used to insert a row in a circuit.

Delete Column \Rightarrow This command is used to delete a column in a circuit.

For more details, refer to FEH597 "2-4-3 Inserting and deleting a row" and "2-4-4 Inserting and deleting a column."

2-2-7 Edit Menu - Insert Returning

This command is used to create a returning line when 12 or more contacts are connected in series in a row. For more details, refer to FEH597 "2-4-5 Inserting a return."

2-2-8 Edit Menu - Line Comment

This command is used to put a comment on each line.

Put the cursor on a line, and then click [Edit] menu > [Line Comment]. The "Line Comment Editor" dialog box opens. Enter a comment, and then click the [OK] button. The line comment is inserted above the cursor. Up to 32767 comment lines can be inserted.







* To edit a comment line, double-click the comment line to open the "Line Comment Editor" dialog box. To delete a comment line, put the cursor on the comment line, and then click [Edit] menu > [Delete Row].

2-2-9 Edit Menu - Instruction List

This command is used to display a circuit of the cursor position in the instruction list.

Put the cursor on a circuit to display in the instruction list, and then click [Edit] menu > [Instruction list]. The Instruction list for the circuit appears.

1 X1.2	Ladder0							
Image: Second	x1.0 x1.2							¥2.
Y2.3 Y2.4 Y2.4 Y2.4 Y2.5 Y2.4 Y2.7 Y2.7								OUT 8
Image: Second	¥2.8							
2 2 1 2 1 2 1 2 1 2 1 2 1 2 1 2 1 2 1 2								
2 X1.2 TON TO 500 ID Timer0 Timer0	0018							
Timer0	2 1.2 2					TON	тО	5000
Astruction list LD X1.0 OR Y2.8 AND X1.2 OUT Y2.8 Changing line is 'Cit! + Enter'	IN2						Timer0	
AND X12 OUT Y28 AND X12 OUT Y28								
nstruction list								
nstruction list UD X1.0 OR Y28 AND X1.2 OUT Y28 Changing line is 'Ottl + Enter' OK Cancel		\prec \succ						
Danging line is 'Citl + Enter'		\sim						
nstruction list LD X1.0 OR Y2.8 AND X1.2 OUT Y2.8 Changing line is 'Ctrl + Enter' OK Cancel								
LD X1.0 OR Y2.8 AND X1.2 OUT Y2.8 Changing line is 'Ctrl + Enter' OK Cancel								
LD X1.0 OR Y28 AND X12 OUT Y28 Changing line is 'Ctrl + Enter'	nstruction list			9				
Changing line is 'Otrl + Enter'	LD X1.0			-				
AND X12 OUT Y28	OR Y28							
OUT Y28 Changing line is 'Ctrl + Enter'	AND X1.2							
Changing line is 'Otrl + Enter'	OUT Y2.8							
Changing line is 'Otrl + Enter'								
Changing line is 'Otrl + Enter'								
Changing line is 'Otrl + Enter'								
Changing line is 'Otrl + Enter'								
Changing line is 'Otrl + Enter' OK Cancel								
Changing line is 'Ctrl + Enter'								
Changing line is 'Ctrl + Enter'								
Changing line is 'Ctrl + Enter'								
Changing line is 'Ctrl + Enter'								
Changing line is 'Ctrl + Enter' OK Cancel								
Changing line is 'Ctrl + Enter' OK Cancel								
Changing line is 'Ctrl + Enter' OK Cancel								
Changing line is 'Ctrl + Enter' OK Cancel								
	Changing line is 'Ctrl + Fr	nter' OK	Cancel					

- * You can edit the program in Instruction list mode.
- * In Instruction list mode, instructions and operands constituting the ladder circuit are listed. The tag is not displayed.
- * To change the instruction code or operand, move the cursor and directly change it.
- * To enter an instruction, directly enter an instruction name.

• Edit the program and click the [OK] button, or [Cancel] button to close the dialog box and return to the normal ladder display. Note: If you change the circuit so that it cannot be displayed by Ladder, an error message appears.

2-2-10 Edit Menu - Multi operation input wizard

This command is used for multiple numeric data operation in ST language. For more details, refer to Appendix 6-3-2.

2-2-11 Edit Menu - Copy to ladder library, Paste from ladder library

These commands are used to save the selected circuit as a library in a file, and paste it from the file to a program.

(1) Copy to ladder library

This command is used to save the selected circuit as a library in a file.

Select a circuit to register in the library. To select the circuit, put the cursor on the starting position (the top left) and scroll down the project window. Then, while pressing the <Shift> key, click on the ending position. The circuit selected and reversely displayed. (Make sure to click on the line No. not inside the line.)





- Click [Edit] menu > [Copy to ladder library].
 The "Copy to Ladder Library" dialog box opens. Enter a file name, and then click the [Save] button.

Copy to Ladder	Library									?	×
Savejn:	C PLC_Pr	ogram			~	G	1	Þ	•		
My Recent Documents											
Desktop											
My Documents											
My Computer											
My Network	File <u>n</u> ame: Save as <u>t</u> ype	:	Flicker1 SX Ladder Libra	ary File (*.slb)				*		iave ancel	
			Ĺ	7							
		SX-I	Programmer S	tandard		×					
		(1 The line	was register	red.						
)K						

(2) Paste from ladder library

This command is used to open a library file and paste it in a program.

Put the cursor on the program, and then click [Edit] menu > [Paste from ladder library]. The "Paste from Ladder Library" dialog box opens. Select a file name, and then click the [Open] button.



Paste from Lad	lder Library						? 🗙
Look in:	🗀 PLC_Program		~ G) 🗊	Þ		
My Recent Documents	Flicker1.slb						
Desktop							
My Documents							
My Computer							
S	File <u>n</u> ame:	Flicker1.slb			*		pen
My Network	Files of type:	SX Ladder Library File (*.slb)			*	Ca	ancel

 \square

The circuit is pasted.



2-2-12 Edit Menu - Book marks

This command is used to set a book mark on a circuit of the cursor position. After setting a book mark, you can search for the book marked circuit or show only the book marked circuit (Ladder filter function). The book mark is effective until the program is closed.

(1) Book marks - Toggle book mark

This command is used to set a book mark on a circuit of the cursor position. If a book mark is already set, the book mark is deleted.



(2) Book marks - Previous book mark / Next book mark

• Previous book mark:

Moves to a book mark that is set above the cursor. If there is no book mark above the cursor, a book mark is searched from the bottom.

· Next book mark:

Moves to a book mark that is set below the cursor. If there is no book mark below the cursor, a book mark is searched from the top.

(3) Book marks - Clear book marks

This command is used to clear all the book marks in the active program.

(4) Book marks - Filter

This command is used to display only a book marked circuit.

2-2-13 Edit Menu - Grid

This command is effective only with the simulation panel and used to change Grid show/hide and set the Grid width.

Grid 🔀
Location Show grid Show grid
Grid Setting ∑-way grid interval: 20 ∑-way grid interval: 20
OK Cancel

<Options>

- Show grid:
 - Check this option to show the grid . Uncheck to hide.
- Snap to grid:

Check this option to adjust parts such as a switches and lamps on the simulation panel to the grid. If you move or resize parts while this option is checked, they are automatically adjusted to the grid.

• Grid setting:

Set the grid size by dot.

2-2-14 Edit Menu - Align

This command is effective only with the simulation panel and used to align multiple parts such as switches and lamps that are arranged on it.

<Options>

- Left: All selected parts are aligned to the left.
- Center: All selected parts are aligned to the center.
- Right: All selected parts are aligned to the right.
- Top : All selected parts are aligned to the top.
- Middle: All selected parts are aligned to the middle.
- Bottom: All selected parts are aligned to the bottom.

2-2-15 Edit Menu - Split Program

This command is used to split a program (POU) into two programs. Use this command when the size of the program exceeds the maximum capacity of one POU. This function is only for the ladder language.

When you execute this command on an arbitrary position in a program, the line of the cursor position and the following lines are cut and another program is newly created.

2-3 View Menu

The View menu contains the following commands:

- Status Bar ⇒ Switches the display of the status bar ON/OFF.
- Project View ⇒ Displays the project view window.
- Find Result ⇒ Displays the find result.

- Tag Rows ⇒ Sets tag rows to display.
- Address Rows ⇒ Sets address rows to display.
- Monitor Data Rows ⇒ Sets monitor rows to display.
- Display Tag / Display Description ⇒ Switches between tag display and description display on a program

- Display Grid Lines ⇒ Shows or hides the grid lines on a ladder circuit.
- Sort Program

 → Arranges the display order of the programs in the "Unassigned Programs" and the "Function Blocks." The "Unassigned Programs" and the "Function Blocks" are on the project view window. The display order in "Program" is not changed.
- Synchronize zoom rate 🗢 Changes the zoom rates of multiple ladder circuits that are simultaneously opened in synchronization.

2-3-1 View Menu - Status Bar / Tool Bar

These commands are used to show or hide the "Status Bar" and the "Tool Bar."

- To show or hide each item,
 - click [View] > [Status bar] or

click [View] > Tool Bar] > [Standard], [Online], [Window], [Break point], [Condition monitor], or [Sampling trace].



Status bar

2-3-2 View Menu - Project View / Instruction Jog

The Project View and the Instruction Jog are displayed by default. These commands are used when you close the displays and want to reopen them.

To display each item,

click [View] menu > [Project View] or click [View] menu > [Instruction Jog].



2-3-3 View Menu -

Find Result / Cross Reference Window / Message Window / Paste Result

These windows are automatically opened when the operation is done such as a search or cross reference creation. These commands are used when you close the displays and want to reopen them.

- ♦ To display each item,
 - click [View] menu > [Find Result],
 - click [View] menu > [Cross Reference Window],
 - click [View] menu > [Message Window" and "Output],
 - click [View] menu > [Message Window" and "Error],
 - click [View] menu > [Message Window" and "Information], or
 - click [View] menu > [Paste Result].

(1) Find Result

This command is used to display the find result of "Find Instructions" and "Find Address" (when the scope of search is "All Programs").



(2) Cross Reference Window

This command is used to display the result of the cross reference creation.

Edit View Project Online Conversion Tools Window Help	
😰 - 🛃 🚰 💁 🛎 🚓 🛤 🕫 唑 🛗 🖾 🗲 🏢 Auto 🔹	1
	-
	TA
$F_2 = F_3 = F_4 = F_5 = F_6 = F_7 = F_6 = F_9 = F_10$	
t View - 4 × Ladder1 Ladder2 Ladder1_0	• ×
oject Manual Intro_A74' A X1.C	
3 System Definition 1 BX1.2 DH40 HOVE DX1.2 DH40 HOVE DX1.2 DH40	머리
Programs 71	
Default: Default 2 JE TON T1 2000m	┦▁┛
Lader1: (1) 71 H0 H0	
Timero HENG	
Unassigned Programs	- 1
IN 4 MEM 0 MEM 1 MEM 2 MEM 3 VIEW When the F1 key is pushed, the guidance is displayed.	
Function Blocks	÷Ċ
Innetin Blocks	▶ ₽ ×
Runchen Bods I	≥ # ×
Indian Bods I II Reference I ag A Access Instruction Symbol Taype Program Line No. Device	× 4 ×
Reference Reference 1 a Access Instruction Symbol Types Program Une No Decise 100 Read LD 1 Program Ladder() 1 1 1	₽ ₩ ×
Indication Books	¥ ×
Indication Bodds Image:	
Function Books Image: Control of the state	¥ ×
Indication Books	
Indication Books	
Endference Image: Second	
Professor Image: Solution and Solution a	
Inclusions Books	
Inclusion Books Image: Second Se	

display the corresponding address/instruction.

(3) Output

This command is used to display the result of the program conversion.



(4) Error

This command is used to display the error list if there is an error after program conversion.



(5) Information

This command is used to display the result of the program conversion and the list of information such as the number of program steps and the number of timers/counters being used.

🗱 SX-Programmer Standard (Prototype) [Ladder1_0]														
Ele Edit View Project Online Conversion Tools Window Help														
🛅 📲 🖕 🕼 🕼 🕼 🕼 👘 🔍 🛗 🖀 🔊 🔍 🛗 🖀 🐓 🗰 🗛	1													
	# ×													
Contact/Output(1) + → F → F → F → F → F → F → F → F → F →														
F2 F3 F4 F5 F6 F7 F8 F9 F10														
Project View - Q X Ladder1 Ladder2 Ladder1_0	• ×													
Project Manual Intro A74'														
T1 T0 T1 2000	-													
Programs Time 1 Mo														
I tadder1_0: (3)														
Device Device														
Ladder0: (0)														
D3: (4)	· _													
	2													
Latormation Program Name Program Tune Sten Heart ER Edge Counter Timer Addus Name C	4 ×													
regularitatile regularityte top over10 toge coulder the Policy une c														
Ladder1 Program 82 step 0 0 1 1 0														
Ladder2 Program 61 step 0 0 0 0 0														
Ladder1_0 Program 60 step 3 0 0 1 0														
asa Function Block 26 step 0 0 0 0 0														
bbb Function Block 26 step 0 0 0 0 0 0														
ccc Function Block 26 step 0 0 0 0 0	- 1													
Program:3 Total Function:0 281step 0 1 2 0														
) F													

(6) Paste result

This command is used to display the result of pasting a MICREX-F or FLEX-PC program using the conversion function.

2-3-4 View Menu - Tag Rows / Address Rows / Monitor Data Rows

These commands are used to change the number of rows of tags (or Descriptions), addresses, and monitor data.

- ♦ To change the number of rows of each item, execute any of the following procedures. Click [View] menu > [Tag Rows] > Hide, 1 Row, 2 Rows, 3 Rows or 4 Rows. Click [View] menu > [Address Rows] > 1 Row, 2 Rows, 3 Rows, 4 Rows or 5 Rows. Click [View] menu > [Monitor Data Rows] > 1 Row, 2 Rows, or 3 Rows.
- * For a Tag (or Description), up to 8 characters can be displayed per row. The characters exceeding the specified number of rows are not displayed.
- * For Monitor data, up to 8 digits can be displayed per row.
 - To monitor data exceeding 8 digits, select 2 Rows or 3 Rows for "Monitor Data Rows." If data exceeding 8 digits is displayed in a row, the last decimal is displayed as "~."

<Example of one-row display>

Ladde	r1 Ladder2	Ladder1_0														- ×
	L1											747 747 747	2345678		2345678	~)-
2 —				_		_		_			*		DL2	100	DL4	
	L2					_		_			📀 v	/hen I	the F1 key is pushe	ed, the guidan	ce is displayed.	
4																▶
Data	Monitor 1															- ×
i e 💷 🚛	X 🕱 🕸	•••					*	<none:< th=""><th>></th><th>- 🖬 🗎 皆</th><th>in .</th><th></th><th></th><th></th><th></th><th></th></none:<>	>	- 🖬 🗎 皆	in .					
Address	Tag				0	F			0	DEC	Н	EX	DATA			
DL2			000	0010	0011	1100	1010	1100	1110	2345678	0023CA	CE	2345678			
DL4			101	1111	1011	0011	1000	0111	1000	234567800	OD FB38	78	234567800			

<Example of two-row display>

Ladde	er1 Ladder	2 Lad	lder1_0	ז													- ×	:
2													+) Wher	23 45 678 DL2 the F1 key is pushe) 100 ed, the guidar	2345678 DL4 nce is displayed.		•
4																	►	
Data	Monitor 1																+ ×	¢
i e 💷 🚛	🗙 🗱 🦊	**	1	F 📰				-	<none:< th=""><th>></th><th>- 📭 🗎</th><th>111 111</th><th></th><th></th><th></th><th></th><th></th><th></th></none:<>	>	- 📭 🗎	111 111						
Address	Tag					0	F			0	DEC		HEX	DATA			-	•
DL2				000	0010	0011	1100	1010	1100	1110	2345678	0023	BCACE	2345678				
DL4				101	1111	1011	0011	1000	0111	1000	234567800	OD FI	33878	234567800				

2-3-5 View Menu - Default/ Integer/ Hexadecimal

These commands are used to change the representation of monitor data.

For example, multiply instructions has the following three types.

MUL: Integer format (with sign) [INT] / double-precision integer (with sign) [DINT]

MUL_UAI: Integer format (without sign) [UINT] / double-precision integer (without sign) [UDINT]

MUL_R: Integer format (double-precision floating-point format) [REAL]

When you use MUL or MUL_UAI, monitor data is represented in an integer number.

When you use MYL_R, monitor data is represented in a double-precision floating-point number.

• Integer \Rightarrow Represents monitor data in a signed decimal number independently of the data format of the operand.

• Hexadecimal \Rightarrow Represents monitor data in a hexadecimal number independently of the data format of the operand.

2-3-6 View Menu - Program No.

This command is used to show or hide program Nos. in the project view window.



2-3-7 View Menu - Sort Program

This command is used to change the display order of the programs in "Unassigned Programs" and "Function Blocks" on the project view window.

Since programs in "Program" relate to the execution order (they are executed from the top), the display order is not changed.

The programs can be sorted in any of the following four orders:

- Sort by Name in Ascending Order ⇒ Arranges alphabetically by program name in ascending order.
 - The order is number (1,2,3...) and alphabet (a to z).
- Sort by Name in Descending Order ⇒ Arranges alphabetically by program name in descending order.
- Sort by Number in Ascending Order \Rightarrow Arranges by program No. in ascending order.
- Sort by Number in Descending Order ⇒ Arranges by program No. in descending order.

2-3-8 View Menu - Zoom

This command is used to change zoom rate of the active window.

◆ Click [Edit] menu > [Zoom]. The following dialog box opens. Select a zoom rate, and then click the [OK] button.

Zoom 🛛 🔀
Rate
○ 2 <u>0</u> 0%
○ <u>1</u> 00%
○ <u>7</u> 5%
○ <u>5</u> 0%
O <u>2</u> 5%
O Auto
O <u>C</u> ustomize: 100 %
OK Cancel

* To specify the zoom rate, select "Customize", and then enter a zoom value in the text box. Range: 10 to 400%. If you select "Auto," the display is automatically adjusted to window size.

2-3-9 View Menu - Display Tag / Display Description

These commands are used to show or hide tags and descriptions on a program. The tags and descriptions cannot be displayed at the same time.

If you select [View] > [Tag Rows] > [Hide], neither tags nor descriptions are displayed.

2-3-10 View Menu - Display Grid Lines

This command is used to select whether or not to display the grid lines (borders of cells) on a ladder program.

2-3-11 View Menu - Synchronize zoom rate

When multiple ladder programs (or multiple ST ladder programs or data monitor screens) are simultaneously opened, the zoom rates can changed in synchronization.

2-4 Project Menu

The "Project" menu contains the following commands:

- Security ⇒ Sets a password to protect contents and sets read only.
- Verify ⇒ Verifies the program displayed on the PLC or loader and the project saved as a file in the computer.
- Import ⇒ Reads the project information (such as a program, tag, line comment, system definition) saved as a file by the "Export" command.
- Export I Saves an open project information (such as a program, tag, line comment, system definition) as a file.

2-4-1 Project Menu - Local Device Setting

This command is used to set a device only effective for specific programs.

Click [Project] menu > [Local Device Setting]. All programs in the project are displayed. Select a program to be specified as a local device setting and click the [Edit] button.

ocal device list:			
Program Name	Non Retain Memory	Retain Memory	Edit
ааа			
bbb			Clear
CCC	-	-	
Ladder0	-	-	Clear all
Ladder1	•	-	
Ladder1_0			
Ladder2	•		
LD3	•	•	
			1
		ОК	Cance

◆ The "Modify" dialog box opens. To set the range of the local device, set "Start Address" and "Data Size."

Mod	lif y (Ladder0/PG	:0)						×
N	on Retain Memory <u>S</u> tart Address:	0	<u>D</u> ata Size	10	w	WM0 -	WM9	
R	etain Memory							
_	Start Address:	0	D <u>a</u> ta Size	: [20]	W	WL0-\	WL19	
						OK	Cancel	
			\bigtriangledown	7				
Loca	al Device Setting	1					×	
Lo	ocal device list:							
Ē	Program Name	Non Reta	in Memory	Retain Me	mory		Edit	
i i	aa sh	-		-				
	CC					_	<u>C</u> lear	
	.adder0	WM0 - W	'M9	WL0 - WL	19		Clear all	
	.adder1 0	-				-		
L L	.adder2	-		-				
L	.D3	-		-				
						ок	Cancel	

* The non-retain memory and retain memory can be specified as a local device. The range starting from the Start Address to the address determined by Local Area (the number of words) can be specified as a local device for the currently open program. Only an even number can be specified for the start address and local area.

2-4-2 Project Menu - Model Change

This command is used to change the PLC model currently assigned to the resource of the project file.

Click [Project] menu > [Model Change]. The "Model Change" dialog box opens. Change the PLC model and PLC memory capacity, and then click the [OK] button.

Model Change	×				
PLC Model	PLC Memory Size				
C SPH200	48K (NP1PM-48E)				
C SPH300	C 48K (NP1PM-48R)				
SPH2000	© 256K (NP1PM-256E)				
C SPB					
C Board Controller					
Initialize system definitions					
OK Cancel					

(1) When "Initialize system definition" is unchecked

• The model change confirmation dialog box appears. Click the [Yes] button to change the model. After model change, the system definition screen opens. Close it, and model change is done.

SX-Programmer 9	5tandard		×
2 Do you	wish to change	the model?	
Yes	No	Cancel	

(2) When "Initialize system definition" is checked

The following dialog box appears.



Click the [Yes] button to initialize the system definition. After initialization of the system definition, the system configuration definition screen opens. Close it, and model change is done.

* If you change the model, "Memory allocation setting" is initialized.

2-4-3 Project Menu - Security - Protection Programs

This command is used to set a password on a specific program and protect it from being opened. If you set protection, the password is retained in the project file until you cancel it. To open the program, the correct password is required. This command can protect both project files saved in computer and transferred to the PLC. * The program cannot be opened. However, tag names can be read or written. (Except the following devices)

T0 to T8191, TR0 to TR8191, C0 to C8191, F

<How to protect a program>

 Click [Project] menu > [Security] > [Protection Programs]. The following dialog box opens. Check the program to protect and click the [OK] button.



The password entry dialog box appears. Enter a password, and then click the [OK] button.

Set Protection Programs	×
Password:	

Password <u>c</u> onfirmation:	

Input the password by a hexadecimal of 1-20 digits	
OK Cancel	

- * Set a password from 1 to 20 characters using hexadecimal numbers (0 to 9, A to F, case insensitive).
- The following dialog box appears. Click the [Yes] button to set protection. When protection is set, the project becomes unconverted. To load the project to the PLC, execute [Conversion] > [Conversion All] after setting protection.



Password setting is complete.



You can check whether the program is protected on the project view window. The protected program is shown with a key mark and cannot be browsed or changed.



<How to release protection>

Click [Project] menu > [Security] > [Release protection program]. The password entry dialog box opens. Enter the password and click the [OK] button.

Release Protection Programs	×
Password:	
XXXX	
Input the password by a hexadecimal of 1-20 digits	
OK Cancel	

The following dialog box appears. Click the [Yes] button to release the protection. When protection is released, the project becomes unconverted. To load the project to the PLC, execute [Conversion] > [Conversion All] after releasing the password.



The protection has been released.


2-4-4 Project Menu - Security - Read Only

This command is used to set a password on a specific project and protect it from being changed. (Read Only) If you set protection, the password is retained in the project file until you cancel it. To write the password-protected project, the correct password is required. This command can protect both project files saved in the PC and transfered to the PLC.

<How to set Read Only>

Click [Project] menu > [Security] > [Set Read Only]. The following dialog box opens. Enter the password and click the [OK] button.

9	Set Read Only	×
	Password:	

	Password <u>c</u> onfirmation:	

	* Input password with 6-32 characters.	
	DK Cancel	

- * Set a password from 6 to 32 characters using hexadecimal numbers (0 to 9, A to F, case insensitive) and special characters (+, -, =, /).
- ◆ The dialog box to promote conversion appears. Click the [Yes] button to set the password.

SX-Programmer Standard						
2	The project must be converted to set read only.					
~	Do you want to convert it?					
(Please load to PLC the project after setting read only. When doing not load to PLC the project, verify does not a						
	<u>Yes</u> <u>N</u> o					

When you change the program and save it as a file or transfer it to the PLC, the password entry dialog box appears. Enter the password and click the [OK] button.



<Release Read Only>

 Click [Project] menu > [Security] > [Release Read Only]. The following dialog box opens. Enter the password and click the [OK] button.



◆ The dialog box to promote conversion appears. Click the [Yes] button to convert the project.

Authentication Read Only	×
Password:	_

* Input password with 6-32 characters.	
OK Cancel	

2-4-5 Project Menu - Verify

This command is used to compare the currently open project with the project file saved in the PC.

Click [Project] menu > [Verify]. The following dialog box opens. Click the [Browse] button, select a project file, and then click the [OK] button. After returning to the "Verify" dialog box, click the [Verify] button.





♦ Verification result is displayed.

Ve	Verification						
60	1 🖭 📀	• 7	e				
	State	Data Type	Current Project	Project 'DeviceB.zpja'			
•	Modified	System Definition	System Structure Definition	System Structure Definition			
0	Modified	System Definition	System Running Definition	System Running Definition			
0	Common	System Definition	System Digital Output Setting	System Digital Output Setting			
•	Modified	System Definition	CPU Running Definition	CPU Running Definition			
•	Modified	System Definition	CPU Memory Border Definition				
•	Modified	System Definition		SRM Band Ratio Definition			
•	Modified	System Definition		Memory Border Definition			
0	Modified	System Definition		CPU Running Definition 2			
•	Modified	System Definition	I/O Group Definition 1	I/O Group Definition 1			
•	Modified	System Definition		I/O Group Definition 2			
•	Modified	System Definition		I/O Group Definition 3			
0	Common	System Definition	Direct I/O Fail-Soft Operation Setting	Direct I/O Fail-Soft Operation Setting			
•	Modified	System Definition	Remote I/O Master 0 Fail-Soft				
•	Modified	System Definition		Ethernet Definition			
0	Common	System Definition	Direct I/O HOLD Definition	Direct I/O HOLD Definition			
•	Modified	System Definition	Direct I/O Running Mode	Direct I/O Running Mode			
•	Modified	System Definition	Remort I/O Master 0 Running Definition				
0	Common	Project	Manual_Intro_A74	DeviceB	More >:		
•	Modified	Task	Default : Default	Default : Default	More >:		
•	Modified	Program (POU Number:0)	Ladder0	Ladder0	More >:		
•	Modified	Circuit	Ladder0 - 1	Ladder0 - 1	More >:		
•	Modified	Program (POU Number:1)	Ladder1	Ladder1	More >:		
•	Modified	Circuit	Ladder1 - 1	Ladder1	More >:		
•	Modified	Program (POU Number:2)	Ladder2	Ladder2	More >:		
•	Modified	Circuit	Ladder2 - 1	Ladder2	More >:		
•	Modified	Program (POU Number:3)	Ladder1_0		More >:		
•	Modified	Circuit	Ladder1_0 - 1		More >:		
•	Modified	Program (POU Number:4)	LD3		More >:		
•	Modified	Circuit	LD3 - 1		More >:		

Verification result White : Common Orange : Modified Gray : Not exist Explanation of Icon



Icon	Explanation
System Definition	Used to show/hide System definition in the "Data Type" column.
Programs	Used to show/hide Circuit in the "Data Type" column.
Common	Used to show/hide Common in the "State" column.
Modify	Used to show/hide Modified in the "State" column.
Filter line strings	Used to enter a filter keyword.
Filter	Enter a filter keyword, and then click this button to filter the list. Only the items that includes the entered keyword are shown. Click this button again to cancel the filter.
Update the latest status	Used to verify one more time

• Double-click a row displaying "Circuit" to display the mismatched line.

Verification 4						ĸ
611						
	State	ES0/ES1	Data Type	Current Project	Project 'MachineA.zpj3'	
0	Common	-	System Definition	Direct I/O HOLD Definition	Direct I/O HOLD Definition	
0	Common	-	System Definition	Direct I/O Running Mode	Direct I/O Running Mode	
0	Common	-	Project	MachineB	MachineA	
0	Common	-	Task	Default : Default	Default : Default	
•	Modified	-	Program: (0)	Ladder0	Ladder0	_
0	Modified	-	Circuit	Ladder0 - 3	Ladder0 - 3	
0	Common	-	Program: (1)	Ladder 1	Ladder 1	
0	Common	-	Circuit	Ladder 1	Ladder1	



4) [Select Mismatch] bar

* This screen is only for confirmation of mismatched lines (only display). They cannot be edited here. Mismatched lines are displayed in light orange. In a mismatched line, a mismatched spot is indicated in dark orange in units of addresses or instructions.

1) [Vertical disposition] button

Click this button to show the verification source project and destination file side by side vertically. When you click the button again, the projects are shown one above the other horizontally.

Ver	ification[Ladder0: (0)]	▼ X
	Current Project [Ladder0: (0)]	Project 'DeviceB.zpja' [Ladder0: (0)]

2) [Open Editor] button

Click this button to open the program in the verification source project.

Verification[Ladder0: (0)]			-	x
X1.0 X1.2			¥2.8	
			OUTS	
¥2.8				
OUTS OUTS				
X1.2	TON	то	5000ms	
	1 011	TimerO	0000110	
			¥2.9	
TimerO MEM1			OUT9	
*				
🕑 When the F	1 key is pushe	d, the guidance	e is displayed.	-
T				

3) [Scroll Synchronization] button

When this button is turned ON, you can scroll both source and destination program windows together.

4) [Select Mismatch] bar

When there are multiple mismatches, double-click the orange part of the bar to display the mismatch spot.

Verifi	ication[Ladder0: (0)]	→ X
	Current Project [Ladder0: (0)]	
	3] [] [] [] [] [] [] [] [] []	¥2.9 () 0UT9
	*	
	<u>«</u>	
	Project 'DeviceB.zpja' [Ladder0: (0)]	
	3 -] [¥2.9
	TIMERO	00T9
	T	▼ ▼

2-4-6 Project Menu - Import

This command is used to import the followings created in another project to the currently open project.

- (1) Program, (2) System Definition, (3)Tag Project, (4) Tag, (5) Line Comment, (6) Initial Value, (7) Array/ Structure,
- (8) Simulation (9) Instruction List
- * (9) Instruction List is dedicated to FLEX-PC (T type) users and used for data linkage with CAD manufactured by SINWA Electric Corporation.

(1) Program

- Programs, function blocks and functions registered in another project file are imported.
- When a function block (or a function) is called in the program, it is also automatically imported. When the "Program Protection" is set in the program or function block (or function), it cannot be imported.
- If the import destination has the same program name as the import source, it is overwritten. If program types (program / function / function block) are different, the import is not done.
- If the import source and destination have the same program No., an unused program No. is assigned to import the program. However, if there is no unused program No., the import is not done.
- ◆ Click [Project] menu > [Import] > [Program]. The following dialog box opens. Click the [Browse] button.

mport Programs	2
Project File Name:	
<u>P</u> rogram List:	<u>B</u> rowse
	Check Tthe Hierarchy Under
	Uncheck The Hierarchy Under
	All Programs
	All <u>F</u> unctions
	All Function <u>B</u> locks
The above list indicate the call relation of Program. Please select Program which does import from the above list. (The protected program is not imported.)	
	Import Close

♦ Select an import source file and click the [Open] button.

Import Program	ns					? 🛛
Look <u>i</u> n:	🚞 PLC_Program		~	G 🦻	• 🖭 🕈	
My Recent Documents Desktop My Documents	Init_Val Init_Val Init_Val Init_Comment PLC_Data RasMsg Sampling_Settir Tag Tag Tag Array_Exm1.zp Rarray_Exm2.zp Example1.zp)3 Example3.zp)3	ıg_File zpj3 j3 j3	Example_FCT.zpj3 Loadernet_01.zpj3 Loadernet_02.zpj3 Manual_Introduction Manual_Print.zpj3 Online_32.zpj3 Online_48E.zpj3 Redundancy_74.zpj Sampling48E.zpj3 Simulation_AFB_jp.z ST_Ex1.zpj3	n. zpj3 3 :pj3		
	File <u>n</u> ame:	Manual_In	troduction.zpj3		~ (<u>O</u> pen
My Network	Files of type:	Project File	es (*.zpj3)		*	Cancel

♦ Select an import source file and click the [Import] button.

Import Programs	×	
Project File Name: Import_Program		
<u>P</u> rogram List:	Browse	
E- Resource	Check Tthe Hierarchy Under	
	Uncheck The Hierarchy Under	
Ladder 0: (0)	All Programs	
	All <u>F</u> unctions	
FCT0: (0)	All Function <u>B</u> locks	
The above list indicate the call relation of Program. Please select Program which does import from the above list. (The protected program is not imported)		
	Import Close	

* When importing FBs starting with "_" that are offered by Fuji Electric (e.g. _Cfrp2.Zpj) including standard expansion FBs, make sure to click the [Check The Hierarchy Under] button to select and import all the items.

- The confirmation dialog box appears. Click the [OK] button to start the import.
 When there is no program to be overwritten

Import Programs					j
The following Prog	grams are imported. A	Are you sure?			
Program Name	Program No.	Program Kind	Import Mode	After Program No.	Error
aaa	0	Function Block	Append	0	
bbb	3	Function Block	Append	3	
ccc	2	Function Block	Append	2	
LD3	4	Program	Append	4	
,					
		OK	Cancel		

When there is a program to be overwritten

Import Programs					×
The following Progr Programs of the sar	ams are imported. A ne name are overwi	re you sure? rited. Please refer to the In	nport Mode row of	f the following list.	
Program Name	Program No.	Program Kind	Import Mode	After Program No.	Error
🚹 Ladder0	0	Program	Overwrite	0	
LD3	4	Program	Append	4	
aaa	0	Function Block	Append	0	
bbb	3	Function Block	Append	3	
CCC	2	Function Block	Append	2	
		ОК	Cancel		

◆ The following dialog box appears when the import is complete.



(2) System Definition

- System definition registered in another project file is imported. The system definition of the currently open program is overwritten.
- If the import source and import destination have a different CPU, the memory allocation setting is initialized.
- Click [Project] menu > [Import] > [System Definition]. The following dialog opens. Select an import source file, and click the [Open] button.

Import System	Definition					? 🛛
Look jn:	C PLC_Program		*	G 💋	بي مح	
My Recent Documents	Ladder PLC_Data RasMsg Sampling_Settin SysDef Tag Tag_Prj Address_assinn	ıg_File	Manual_Introduction.a Manual_Print.zpj3 Manual_Print.zpj3 Online_32.zpj3 Online_48E.zpj3 Redundancy_74.zpj3 Redundancy_74.zpj3 Simulation_AFE_in_zpj3	zpj3		
My Documents	Array_Exm1.zpj Array_Exm2.zpj Example1.zpj3 Example2.zpj3 Example3.zpj3	;3 j3	ST_Ex1.2pj3			
My Computer	Loadernet_01.z	:pj3 :pj3				
	File <u>n</u> ame:	Manual_In	ntroduction.zpj3		~ (<u>O</u> pen
My Network	Files of type:	Project File	es (*.zpj3)		*	Cancel

The confirmation dialog box appears. Click the [Yes] button to start the import.

SX-Progr	ammer Standard 🔀
1	Please confirm the settings of the system definition which will open after importing. Do you wish to import the system definition?
	<u>Yes</u> <u>N</u> o

• When the import is complete, the system definition is displayed. Confirm the contents, and then close the system definition.



(3) Tag project

Tag project file is imported to the currently open project.

Click [Project] menu > [Import] > [Tag project]. The following dialog box opens. Select an import source file (*.Tpj), and click the [Open] button.

Import Tag Pro	ject							? 🗙
Look jn:	🗀 Tag_Prj		*	G	1	ø	•	
My Recent Documents Desktop My Documents	Example2.files							
My compater								
	File <u>n</u> ame:	Example2.tpj				*		<u>O</u> pen
My Network	Files of type:	Tag Project (*.tpj)				*		Cancel

(4) Tag

- A tag file (*.csv or *.txt) exported from another project file is read and added to the currently open project. If a tag has been already registered in an address, it is overwritten by the read tag.
- ◆ Click [Project] menu > [Import] > [Tag]. The "Import Tag" dialog box opens.



- 1) Set a tag file name to import. Click the [Browse] button and select a tag file.
- 2) Select a target program.
- All tags: Global devices (M, L, X, Y, SM) of all programs are imported.
- Selected tag: Programs can be individually selected. Only one program can be selected. If you select <Common>, global devices (M, L, X, Y, SM) of all programs are imported. If you select a specific program, local devices (T, C) of that program are imported.
- Select items to import, and then click the [Import] button. When the import is complete, the following dialog box appears.



(5) Line Comment

- This command is used to edit all created line comments in a batch. (for example, when replacing line comments in Japanese to in English). Export the line comment file (*.TXT, *.csv) from a project file, edit it in the text editor, and import it to the project.
- ◆ Click [Project] menu > [Import] > [Line Comment]. The following dialog box opens. Click the [Browse] button.

Import Comme	nt File from Tex	ct File				? 🔀
Look jn:	🚞 Line_Commer	nt	~	G 🖻 🖻		
My Recent Documents	Example3_Com	nment.txt				
Desktop						
My Documents						
My Computer						
	File <u>n</u> ame:	Example3_Comment	t.txt	*		<u>O</u> pen
My Network	Files of <u>type</u> :	Text File (*.txt; *.csv)	*		Cancel

♦ When the import is complete, the following dialog appears.



(6) Initial Value

- An Initial value file (*.CSV) exported from another project file is read and added to the currently open project. If an initial value has already been registered in an address, it is overwritten by the read initial value.
- Click [Project] menu > [Import] > [Initial]. The following dialog box opens. Select an import source file and click the [Open] button.

Import Initial D	ata File							? 🛛
Look <u>i</u> n:	🚞 Init_Val			*	G	0	•	
My Recent Documents	Example3_Initia	alData.csv						
My Documents								
My Computer								
	File <u>n</u> ame:	Example3_In	itialData.csv			*	•	<u>O</u> pen
My Network	Files of type:	CSV File (*.c	sv)			~	•	Cancel

♦ When the import is complete, the following dialog box appears.



(7) Array / Structure

Array/Structure definition in another project is imported. For more details, refer to Appendix 4-5.

(8) Simulation

- Contents of a simulation folder registered in another project file (simulation panel, AFB) are imported. Only StandardV3 files can be selected. If there is a folder that has the same name in the import destination, the name is automatically changed and the import is done.
- Click [Project] menu > [Import] > [Simulation]. The following dialog box appears. Click the [Browse] button and select an import file.





Import Simulati	ion		?×
Look jn:	🚞 PLC_Program	 3 🕸 📂 🛄• 	
My Recent Documents Desktop	Tag Tag_Prj Example1.zpj3 Example2.zpj3		
My Documents			
My Computer			
	File <u>n</u> ame:	Example2.zpj3	<u>]</u> pen
My Network	Files of <u>type</u> :	Project Files (*.zpj3)	ancel

• Files in the simulation folder of the import source are listed. Check items to import and then click the [Import] button.



♦ When the import is complete, the following dialog box appears.



2-4-7 Project Menu - Export

This command is used to export the followings from the currently open project.

- (1) Tag Project, (2) Tag, (3) Line Comment, (4) Initial Value, (5) Cross Reference, (6) Device Information, (7) Ladder Data, (8) Instruction List
- * (8) Instruction List is dedicated to FLEX-PC (T type) users and used for data linkage with CAD manufactured by SINWA Electric Corporation.

(1) Tag Project

Tag and line comment data are exported in the text format (tag in csv file). Exported data can be edited by a text editor or excel.

Click [Project] menu > [Export] > [Tag Project]. The following dialog box opens. Enter a tag project name, and then click the [Save] button.



(2) Tag

- Tag information is exported as a tag file (*.CSV or *.txt) from the currently open project file.
- ◆ Click [Project] > [Export] > [Tag]. The following dialog box opens.

1)	/ ²⁾	
Export Tag		×
 ▲II tags Selected tag Common> Common> Ladder0: (0) Ladder1: (1) Ladder1: (2) FB0: (0) FB1: (1) FCTD: (0) 	Tag File <u>Filename:</u> <u>Browse</u> Option Image: All address Input/Output address <u>Export unasigned address</u> Memory address <u>Export</u> Cancel	3)

- 1) Select a program to export
- All tags: Global devices (M, L, X, Y, SM) of all programs, and local devices (T,C) of each program are exported.
- Selected tag: Programs can be individually selected. Only one program can be selected. If you select <Common>, global devices (M, L, X, Y, SM) of all programs are exported. If you select a specific program, local devices (T, C) of that program are exported.
- 2) Set a tag file name. Click the [Browse] button, select a storage folder, and enter a file name.
- 3) Select target devices.
 - All address: All devices with a tag are exported.
 - Input/Output address: X and Y devices with a tag are exported.
 - Export unassigned address: All the X and Y devices that are defined by system definition are exported.
- Memory address: Devices with a tag except X and Y devices are exported.
- Select items to export, and then click the [Export] button. When the export is complete, the following dialog box appears.



(3) Line Comment

- This command is used to edit all created line comments in a batch. (for example, when replacing line comments in Japanese to in English). Export the line comment file (*.TXT, *.csv) from a project file, edit it in the text editor, and import it to a project.
- Click [Project] menu > [Export] > [Line Comment]. The following dialog box opens. Enter a file name, and then click the [Save] button.

Export Comme	nt File to Text F	ile						? 🗙
Save jn:	🛅 PLC_Program		~	G	1	Þ	•	
My Recent Documents Desktop	Tag_Prj							
My Documents								
	File <u>n</u> ame:	Example1_Comment.txt				*		<u>S</u> ave
My Network	Save as type:	Text File (*.txt; *.csv)				*		Cancel

♦ When the export is complete, the following dialog box appears.



(4) Initial Value

- Initial value information is exported as an initial value file (*.CSV) from the currently open project file.
- Click [Project] menu > [Export] > [Initial Value]. The following dialog box appears. Enter a file name, and then click the [Save] button.

Export Initial D	ata File						? 🔀
Savejn:	🗀 PLC_Program		~	6	1 🖻	•	
My Recent Documents	Tag Tag_Prj						
My Documents							
My Computer							
	File <u>n</u> ame:	Example1_InitialData.csv			*	(<u>S</u> ave
My Network	Save as <u>t</u> ype:	CSV File (*.csv)			*	(Cancel

♦ When the export is complete, the following dialog box appears.



(5) Cross Reference

- Cross reference information is exported as a cross reference file (*.CSV) from the currently open project file.
- Click [Project] menu > [Export] > [Cross reference]. When a cross reference is not created completely, the following dialog appears. Click the [Yes] button.



The following dialog box opens. Select a folder to save a cross reference file, enter a file name, and then click the [Save] button.

Export Cross R	eference					? 🗙
Save jn:	🗀 PLC_Program		• G	ø 1	ب 📰 🕈	
My Recent Documents Desktop	Tag Tag_Prj					
My Documents						
My Computer						
	File <u>n</u> ame:	Example2_CrossReference.csv			*	<u>S</u> ave
My Network	Save as <u>t</u> ype:	CSV File (*.csv)			~	Cancel

♦ When the export is complete, the following dialog box appears.



(6) Device Information

Device information of the currently open project is saved as a file. This information is used for:

- 1) Device information for POD (UG/MONITOUCH series) to share devices with Standard loader.
- * For the POD operations, refer to the manual of POD.
- 2) Device information for Communication middleware.

Note: This device information file can be used in the UG series loader (Type: UG00S-CW) version 3.2.2.1 or later.

◆ Click [Project] > [Export] > [Device Information]. Enter a file name, and then lick the [Save] button.



• Device information files are created. Device information consists of multiple folders and files as shown below.



(7) Ladder Data

Ladder data information used for POD (UG/MONITOUCH series) ladder monitor function is exported as a file.

Click [Project] menu > [Export] > [Ladder Data]. The following dialog box opens. Enter a file name, check a program name to export, and then click the [Export] button.



◆ Ladder data file are created. Ladder data consist of multiple folders and files as shown below.



Program type	Monitor (Export) Yes/No
Standard FB	No
Password protected program	No
ST program	No
AFB	No
Other programs	Yes

2-4-8 Project Menu - Cross Reference

This command is used to create a cross reference of the currently open project.

A cross reference shows the addresses used in the program, tag names corresponding to them, types of read and write, instruction words, program names, and line Nos.

◆ Click [Project] Menu > [Cross Reference] > [Create Cross Reference]. The Cross Reference window opens.

	/ Double-click this cell to sort.									
Cross Re	ross Reference									×
7 🛃						/				
Device	Tag	Access	Instruction	Symbol	Туре	Program	Line No.	Device Pos.	Setting Value]^
X1.0	IN0	Read	LD	-11-	Program	Ladder0	1	1		
X1.2	IN2	Read	AND	- -	Program	Ladder0	1	3		
X1.2	IN2	Read	LD	- -	Program	Ladder0	2	1		
X1.4	IN4	Read	LD	- -	Program	LD1	4	1		
X1.5	IN5	Read	AND	- -	Program	LD1	6	3		
X1.6	IN6	Read	LD	- -	Program	LD1	1	1		
X1.7	IN7	Read	AND	- -	Program	LD3	8	4		
DX1.2		Read	MONE		Program	LD1	1	2		
WX1.1		Read	MOVE		Program	LD1	5	2		
Y2.4	OUT4	Write	ол	-()-	Program	LD1	4	6		
Y2.5	OUT5	Write	OUT	-()-	Program	LD1	7	2		*

Double-click an arbitrary row to display the corresponding line

[Filter] button: Click this button to display the following dialog box. Check items to filter, and enter an address to display with filtering or select an item. And then, click the [OK] button. Only the items meeting the conditions are displayed.

Filter									
☑ Device	• [✓ <u>A</u> ccess	Instruct	tion/Symboli	🗌 Iype	•	Program		OK
MO	•	Write	► -()-	1	Y Program	n 💌	FCT0		Cancel
				,					
Oroco Ref	proneo				•				
									T 2
T E A									
Device	Tag	Access	Instruction	Symbol	Туре	Program	Line No.	Device Pos.	Setting Value
MO	Flicker_Out	Write	олт	-()-	Program	LD1	3	6	
MO	Flicker Out	Write	OUT	-()-	Program	LD3	3	6	

[Update] button: Click this button to update the cross reference display.

[Trace Back] button: When multiple rows in the cross reference are double-clicked, the corresponding circuits are displayed in order. Use this button to return to the previously selected row.

[] [Trace Forward] button: This button has the opposite function of the [Trace Back] button.

2-5 Online Menu

The "Online" menu contains the following commands.

- Communication Setting ⇒ Makes communication setting with the PLC.
- Simulation Mode ⇒ Performs offline simulation of the PLC.
- PLC Operation (Run/Stop, Load) ⇒ Performs various kinds of operations to the PLC.
- Monitor ⇒ Performs online monitoring of the PLC.
- Load the changed program into PLC ⇒ Used when you edit circuits during online operation
- Break Point ⇒ Makes a break point setting.
- Condition Monitor ⇒ Makes a condition monitor setting.
- Sampling Trace ⇒ Makes a sampling trace setting.
- Program Operation ⇒ Enables or disables the programs loaded to PLC
- Task Execution Time Measurement
 Measures time of task execution.
- Data Monitor ⇒ Performs the device monitoring.

The following three commands have been removed in the version V3.0.6.24 because they may cause a fault depending on the usage.

- Read Data ⇒ Reads a device condition saved as a file in the computer to a loader.
- Load Data to PLC ⇒ Transfers the device condition saved as file in the computer to PLC.

<Description>

Only the device memories whose data are being monitored are read from the memory of the PLC by the "Save Data" command. Device memories that are not being monitored are saved as zero.

If the data saved here is written to the PLC by the "Load Data to PLC" command, zero is written to the memory area that is not being monitored. Depending on how the system is operating, your important data may be deleted. For this reason, the above commands have been removed in the version V3.0.6.24.

When you want to save data, alternatively use the SX control utility function described in Appendix 1.

2-5-1 Online Menu - Communication Setting

This command is used to make communication settings with the PLC.

(1) Direct communication with connected PLC

• Click [Online] menu > [Local Device Setting]. The "Communication Setting" dialog box opens. Click the [Setting] button.

Communication Setting			>
	USB Time out: 3000ms Data size: 492byte	<u>S</u> etting	
		S <u>e</u> tting	ar
		Se <u>t</u> ting	ar
		Setti <u>ng</u>	aī
<u>Communication test</u>		En <u>h</u> anced setti	ng
Loader network registration	ationLoa <u>d</u> /Delete	OK Cance	el

◆ The [setting] dialog box opens. Select a type of the communication port.

50	etting		×
	CommunicationPort		
	⊙ <u>U</u> SB	C Communication <u>b</u> oard	
	C COM port	◯ <u>M</u> odem	
	◯ <u>E</u> thernet		
	Setting		
	Only one PL	C can be connected.	
		OK Cancel	

* SPB supports only "COM port."

<In the case of USB>

Select "USB" to connect to a USB port built-in the CPU.

When you install a loader software and use the online tool with a USB for the first time, the requirement screen of the USB driver appears.

The USB river (ScUsb.inf) is stored in "/Driver/MICREXSX", in the Install folder of the loader software.

For more details of USB driver installation, refer to "Appendix 9 USB Driver Installation."

Se	etting		×
	CommunicationPort		
	⊙ <u>U</u> SB	🔿 Communi	cation <u>b</u> oard
	C COM port	O <u>M</u> odem	
	C <u>E</u> thernet		
	Setting		
	Only one	PLC can be connec	ted.
	[ОК	Cancel

<In the case of COM port>

Select "COM port" to connect to a CPU loader port using a dedicated cable by Fuji Electric or to connect via a general purpose communication module.

Set the port number of the loader according to the port number of the computer.

Setting	X	Сом	1 Properties		
CommunicationPort		Po	rt Settings		
⊂ <u>u</u> sb	C Communication <u>b</u> oard				
<u>C</u> OM port	C Modem				
C <u>E</u> thernet			<u>B</u> its per second:	38400	✓
Setting	/		<u>D</u> ata bits:	8	~
COM port: [1 [Enabled]	Port setting		<u>P</u> arity:	Even	~
			<u>S</u> top bits:	1	~
	OK Cancel		<u>F</u> low control:	None	~
				<u>R</u> estore D	efaults
				ОК	Cancel

When connecting to a loader port, you do not need to change the above settings.

* Dedicated cable:

For SPH:

Combination of NP4H-CVU and NP4H-CB2 (USB connection) or Combination of NW0H-CNV and NP4H-CB2 (RS-232C connection) For SPB:

Combination of NP4H-CVU and NW0H-CA3 (USB connection) or Combination of NW0H-CNV and NW0H-CA3 (RS-232C connection)

<In the case of Ethernet>

Select "Ethernet" to connect to the Ethernet port built-in the CPU or connect via an Ethernet module.

Set the IP address and port number of the connection partner.

The default settings are as follows. Partner IP address: 192.168.0.1, Partner port No.: 507.

The order is "Target IP address", a space, and "Target port No."

Example: 192.168.0.1 507 (Integer value)

Se	etting	×
	CommunicationPort	
	C <u>U</u> SB	Communication <u>b</u> oard
	C COM port	◯ <u>M</u> odem
[Setting	
	I <u>P</u> Address: 192.168.0.1.507	
l		
		OK Cancel

<In the case of Modem>

Select "Modem" to connect via a modem. Install the modem driver to be used first. Then select it from the list and enter the telephone number to connect.

Setting		×
CommunicationF	ort	
⊂ <u>u</u> sb	C Communication	<u>b</u> oard
C COM port	Modem	
C <u>E</u> thernet		
Setting		
M <u>o</u> dem:	WAN Miniport (L2TP)	<u>S</u> etting
Phone <u>n</u> umber:	048-548-****	<u>R</u> egister
	⊙ <u>T</u> one C <u>P</u> ulse	
	ОК	Cancel

<In the case of communication board>

Select "communication board" to connect via a board that supports the extended slot of the computer.

Setting	×
CommunicationPort	
⊂ <u>u</u> sb	• Communication board
C COM port	O Modem
◯ <u>E</u> thernet	
Setting	
Communication board type:	FL-net(LAN board)
Parameter:	192 168.250.1
	OK Cancel

Parameter setting of the communication board differs according to the board type as show below.

- 1) SX bus board
- There is no parameter.
- 2) PCI bus P-link board"Communication partner point P station No."Example: 15 (decimal notation)
- PCI bus PE-link board
 "Communication partner point PE station No.", "Own No." Example: 63 0 (decimal notation)
- 4) ISA bus PLC board There is no parameter.
- 5) PCI bus PLC board There is no parameter.
- 6) PCI bus FL-net board
 "Partner IP address", space, "Own IP address"
 Example: 192.168.250.5 192.168.250.1 (decimal notation)
- 7) FL-net board (LAN board)

"Partner IP address", "Own IP address", "A = IP address", "B = IP address"

(Enter a space between each address.)

Example: 192.168.250.5 192.168.250.1 A=192.168.250.1 B=192.168.250.2 (decimal notation)

- * Parameters other than "Partner IP address", "Own IP address" can be omitted.
- * The allowable ranges of the node number (host address) in the "Own IP address" is 1 to 64.
- * Be sure to make "Own IP address" agree with the IP address in the LAN board.
- Note: The LAN board is only supported by NP1L-FL1. NP1L-FL2 and FL3 do not support the LAN board. To connect to NP1L-FL2/FL3, use an FL-net board.
- ◆ When the setting is done, click the [OK] button to return to the previous screen. Click the [OK] button to close the "Communication setting" dialog box.

(2) Loader network communication

<Overview>

In a link system using the P/PE-link module, FL-net module, Ethernet interface module, and general-purpose communication module (RS-485) of MICREX-SX series, you can perform remote operations (e.g. program download/upload, monitor, test functions) from the loader connected with one CPU module to the CPU modules in 3-layer SPH system.

You can also perform remote operations from the loader connected with another CPU module. The maximum number of remote operation routes is two (at the time of simultaneous operation).

In addition, in a simplified CPU link using a communication adapter (RS-485) of SPB series, you can perform remote operations from the loader connected to the basic unit with station No. 0 to another basic unit. (one layer and one route only)

* A loader network using the simplified CPU link is supported by all types and all versions of basic units/communication adapters.

<Applicable versions>

To perform remote operations with a 3-layer 2-route loader network, use a communication module with the following software version.

Module		Version
	SPH300	Software version V38 or later
CPU module	SPH2000/3000	All versions
	SPH200	Software version V37 or later
	P-link module	Software version V33 or later
	PE-link module	Software version V33 or later
Communication	FL-net module	Software version V30 or later
module	Ethernet module	Software version V30 or later
	General-purpose communication module (RS-485)	Software version V30 or later

* Setting of "(1) Direct communication with connected PLC" is necessary even when using loader network communication. The loader network communication setting is explained below.

<Loader network setting>

◆ Click [Online] menu > [Communication Setting]. The "Communication Setting" dialog box opens. Click the [Setting] button.

Communication Sett	ing		×
	USB Time out: 3000ms Data size: 492byte	Setting	
		Setting Olear	
		Settins Clear	
		Setting Clear	
<u>Communication</u>	test	Enhanced setting	
Loader network reg Registration	istration Loa <u>d</u> /Delete	OK Cancel	

The "Setting" dialog box opens. Select a module type to be used, local SX bus station No. (or CPU No.) and SX bus station No. (or address) of the connection partner, and then click the [OK] button.

Setting	
Module type: P Link	~
Sending source	
CPU N <u>u</u> mber:	8
Range: 8 - 15	
Sending destination	
P Link <u>s</u> tation:	1
Range: 00 – 0F	
ОК	Cancel

◆ The following dialog box appears. Click the [OK] button.



The first level setting of the loader network is now complete.
 To access the next level CPU, click the [Setting] button and perform communication settings.

Communication Setti	ng		×
	USB Time out: 11000ms Data size: 200byte	<u>S</u> etting	
	[CPU No:8] = P Link	S <u>e</u> tting Clear	
	(P Link station, I)	Setting	
		Setti <u>ng</u> Clea <u>r</u>	
	lest	Enhanced setting.	
Loader network regi Registration	stration Load/Delete	OK Cancel	

The buttons of loader network setting

Communication Setting			X
USB Time out: Data size:	11000ms 200byte	<u>S</u> etting	
[CPU No:8]	ion:1]	S <u>e</u> tting	Clear
		Setting	Clear
		Setting	Ciea <u>r</u> 2)
<u>Communication test</u> Loader network registration Registration Loag	4) 1/Delete	CK	d setting Cancel
- 1) [Communication test]: Performs communication test in the set loader network.
- When the communication is established successfully, the following dialog box appears.



• When the communication fails, the dialog box shows the route where the communication fails, as shown below.

Communication Set	ting	X
	COM 1 Time out: 11000ms Data size: 200byte	<u>S</u> etting
	[CPU number: 8]	
——————————————————————————————————————	= P Link	S <u>e</u> tting Clear
Please confirm the	loader network setting and the netwo	ork module.
	[P Link station: 01]	
	[CPU number: 9]	
	FL-net(OPCN-2)	Setting Clear
	[FL-net(OPCN-2) station: 02]	
		Setting Clear
<u>Communication</u> te	est	Enhanced setting
Loader network regis Registration	tration Loa <u>d</u> /Delete	OK Cancel

2) [Enhanced setting]: Makes settings of the time out interval of loader network communication and communication data size.

×
ms
byte
el

Set the time out and data size according to the network type to be used. Confirm your network type, and set the following values. You usually do not need to pay attention since the loader automatically sets the optimum values when the network is set.

Network	Timeout (ms)	Data size (byte)
P-link	11,000	200
PE-link	11,000	200
Ethernet	11,000	492
RS485	11,000	492
FL-net	11,000	492
LE-net	11,000	104
Simplified CPU link	11,000	492

3) [Registration]: Registers the setting of loader network communication with a name.

Registration	×
Ragistration name of route informal	tion:
Produce line1	
ОК	Cancel

4) [Load/ Delete]: Loads or deletes the setting of the registered loader network communication.

Load/Delet	e		×
Loader Ne	<u>t</u> work:		
Process lin	ie 1		
Produce li	ne 2		
		1	
	<u>L</u> oad	<u>D</u> elete	Cancel

2-5-2 Online menu - Simulation mode

This command sis used to simulate PLC operation in offline mode. For more details, refer to Appendix 3.

2-5-3 Online menu - PLC Operation (Run/Stop, Load)

This command is used to perform various PLC operations such as Run/Stop PLC, Write/Read Program, and failure diagnosis.



2-5-3-1 PLC operation buttons

The followings explains the functions of the buttons.

(1) Batch operation / Individual operation

• Batch operation: All the CPUs in an SX-bus system (in the same configuration) are controlled.

Check this option to control all the CPUs in a multi CPU system in a batch. [Run], [Initial Run], [Stop], and [Reset] commands are effective.

• Individual operation: One CPU to which the loader is connected is controlled. All the commands are effective.

(2) Stop

This button is used to stop the working CPU. This function is available only when the CPU key SW is set at TERM.

(3) Run

This button is used to start a stopping CPU. This function is available only when the CPU key SW is set at TERM. A CPU in fatal fault cannot be started by this button. The non-retain memory is cleared at start-up.

(4) Initial Run

This button is used to initial-start a stopping CPU. This function is available only when the CPU key SW is set at TERM. A CPU in fatal fault cannot be started by this button.

The difference from "Run" is that not only the non-retain memory but also the retain memory is cleared at start-up. The retain memory is not cleared in normal use. Therefore, this button is disabled by default to avoid using it by mistake. To use this function, click [Tool] menu > [Option]. On the "Options" dialog box, select "Online, and then check "Permit the use of Initial Run."

(5) Reset

This button is used to reset the CPU. The CPU needs to be reset (or switched ON/OFF) when you create a new program and download it to the PLC, or edit system definition and download programs to the PLC. This command is available only when CPU key SW is set at TERM.

*In a redundant system or a multi CPU system, do not perform reset operation when CPU 0 is disconnected.

(6) Load to PLC

This button is used to transfer the contents of the currently open project to the PLC. Be sure to execute conversion before the transfer.

Load to PLC	×
✓ Program	
🔲 Cl <u>e</u> ar retain memory area	
🔲 Cle <u>a</u> r FB/SFB variables	
System definition	
ZipFile	
☑ Zip file	
✓ Program name	
☑ <u>T</u> ag	
☑ Line comment	
System Configuration	
Tag Project	
EB Parameter data	
Mgdule driver	
	_
Loa <u>d</u> to PLC Close	

The "Load to PLC" dialog box consists of the following options. Use the default settings normally. However, to use "Tag Project," "FB Parameter data," and "Module driver," the conditions explained below need to be satisfied.

• Program:

Programs in the project view window. Unassigned programs are not loaded.

Clear retain memory area:

The retain memory in the CPU is cleared. Normally, do not select this.

Clear FB/SFB variable:

Variables held in FB (function block) and SFB (system FB such as a counter FB, or Integral timer FB) are cleared. Normally, do not select this.

In SPH200, this option is disabled since the FB/SFB variables are forcibly cleared by the PLC when the program is loaded to the PLC.

- System definition:
 - System definition in the project view window
- Zip file:

Zipped program name / Tag / Line comment / System configuration are transferred.

Program name: Program name shown in the project view window

- Tag: Device tag
- Line comment: Line comment in a program

System configuration: Module name defined in system definition

- Tag project:
 - A tag project is loaded to the user ROM in the PLC. (Enabled when a user ROM is attached to the CPU.)
- FB parameter data:
 - This option is enabled when a PID FB is used.
- Module driver:
 - This option is enabled when an Ethernet / ADS-net / PC card / LON WORKS module is used.
 - * When you connect the loader to a general-purpose module (NP1L-RS*) and perform the download via it, the module driver cannot be loaded. (A general-purpose module does not support the download of a module driver.)

(7) Load from PLC

This button is used to read the contents of the PLC.

Load from PLC	×
Load From PLC Option ✓ Load in Zip File ○ Zip File ○ Tag Project	
Project Provide the system Configuration information automatically when the system definition is not set in PLO(At the power supply reclosing after a clear system definition or the resource is initialized).	
Load From PLC Close	

The "Load from PLC" dialog box consists of the following options. Use the default settings normally.

Load in ZIP File:

A ZIP file (Program names, tag names, line comments, and system constructions) is read.

Zip file: Check this option to read a zip file from the PLC.

Tag project: Check this option to read a tag project file saved in the user ROM attached to the CPU. (Enabled when a user ROM is attached to the CPU and a tag project is saved in it.)

Project: Check this option to read a zip file stored in a project file (*.Zpj3) saved in the computer.

Reflect Real Structure:

Uncheck this option to read a program from a working system.

For example, when you purchase a new CPU and have not loaded system definition yet, or when you have executed memory clear, no system definition exists in the CPU. If a CPU without system definition is started, the CPU automatically recognizes the modules connected to the SX bus system and creates system definition. To read the contents of the PLC in such a condition, check this option.

(8) Verify with PLC

This button is used to compare the currently open project with the contents of the PLC. "Tag project" is enabled when a user ROM is attached to the CPU.



The verification result is displayed.

Ve	rification				
60	1 🖭 🥥	1	• 🛛 🔹		
	State	Data Type	Current Project	Project CPU0	
\bigcirc	Common	System Definition	System Structure Definition	System Structure Definition	
0	Common	System Definition	System Running Definition	System Running Definition	
0	Common	System Definition	System Digital Output Setting	System Digital Output Setting	
0	Common	System Definition	CPU Running Definition	CPU Running Definition	
0	Common	System Definition	CPU Memory Border Definition	CPU Memory Border Definition	
0	Common	System Definition	I/O Group Definition 1	I/O Group Definition 1	
0	Common	System Definition	I/O Group Definition 2	I/O Group Definition 2	
0	Common	System Definition	I/O Group Definition 3	I/O Group Definition 3	
0	Common	System Definition	Direct I/O Fail-Soft Operation Setting	Direct I/O Fail-Soft Operation Setting	
0	Common	System Definition	Direct I/O HOLD Definition	Direct I/O HOLD Definition	
0	Common	System Definition	Direct I/O Running Mode	Direct I/O Running Mode	
0	Common	System Definition	Prosessor Link 0 Running Definition	Prosessor Link 0 Running Definition	
0	Common	Project	Loadernet_01	CPU0	More >>
•	Modified	Task	Default : Default	Default : Default	More >>
0	Common	Program: (0)	Ladder0	Ladder0	More >>
•	Modified	Circuit	Ladder0 - 3	Ladder0 - 3	More >>
•	Modified	Program: (1)	Ladder1	PG00001	More >>
•	Modified	Circuit	Ladder1 - 3	PG00001 - 3	More >>
•	Modified	FB Instance	Address Allocation	Address Allocation	

The verification result is classified by color.

White: Common Orange: Modified Gray: Not exist

For more details of verification, refer to "2-4-5 Project Menu - Verify."

(9) Clear

This button is used to clear the contents of the PLC.



Select the items you want to clear.

To clear all the contents of the PLC, check "Resource initialization." Even if a password or read only is set, the contents can be cleared.

(10) User ROM

This button has the following three functions: Verify, Security, and Export user ROM File to Text File. This button is enabled when a user ROM is attached to the PLC.

(10) -1 Verify

This command is used to compare the currently open project with the contents of the user ROM attached to the PLC.

User ROM
Verify Security Export user ROM File to Text File Loader Program System Definition Zip File
 ⊘ Zip File ○ Iag Project
<u>V</u> erify Close

The verification result is displayed.

Ver	rification				
67	1 🖭 🔮		• 🍸 🔯		
	State	Data Type	Current Project	Project User ROM	
$\overline{\mathbf{S}}$	Common	System Definition	System Structure Definition	System Structure Definition	
0	Common	System Definition	System Running Definition	System Running Definition	
0	Common	System Definition	System Digital Output Setting	System Digital Output Setting	
0	Common	System Definition	CPU Running Definition	CPU Running Definition	
0	Common	System Definition	CPU Memory Border Definition	CPU Memory Border Definition	
0	Common	System Definition	I/O Group Definition 1	I/O Group Definition 1	
0	Common	System Definition	I/O Group Definition 2	I/O Group Definition 2	
0	Common	System Definition	I/O Group Definition 3	I/O Group Definition 3	
0	Common	System Definition	Direct I/O Fail-Soft Operation Setting	Direct I/O Fail-Soft Operation Setting	
0	Common	System Definition	Direct I/O HOLD Definition	Direct I/O HOLD Definition	
0	Common	System Definition	Direct I/O Running Mode	Direct I/O Running Mode	
0	Common	System Definition	Prosessor Link 0 Running Definition	Prosessor Link 0 Running Definition	
0	Common	Project	Online_32	User ROM	More >>
•	Modified	Task	Default : Default	Default : Default	More >>
0	Common	Program: (0)	Ladder0	Ladder0	More >>
•	Modified	Circuit	Ladder0 - 3	Ladder0 - 3	More >>
•	Modified	Program: (1)	PG00001	Ladder1	More >>
•	Modified	Circuit	PG00001 - 2	Ladder1 - 2	More >>
•	Modified	FB Instance	Address Allocation	Address Allocation	

The verification result is classified by color. White: Common

- Orange: Modified Gray: Not exist

For more details of verification, refer to "2-4-5 Project Menu - Verify."

(10) -2 Security

This command makes the user ROM attached to the PLC read-only.

For more details of read only setting, refer to "2-7-1 Tools Menu - User ROM Utility."

(10) -3 Export user ROM File to Text File

The contents of the file (data) written into the user ROM attached to the PLC by F_WRITE FB are outputted as a text.

- Attach a user ROM card to the CPU module and establish access to the user ROM (UROM_LED lights up).
 - In the following dialog box, set the items below. "User File": Enter the file name in the user ROM.

 - "Text File": Click the [Browse] button and specify the folder to save and the storage file name.

Then, click the [Export] button.

* Up to 20 histories regarding the export source and exported files are stored.

User ROM
Verify Security Export user ROM File to Text File
User ROM User File:
Data01
Destination Text File:
E:\Program Files\Fuji Electric\SX-Progran 🔽 🛛 🛛 🛛 🛛 🛛 🖓
<u>E</u> xport Close

When outputting a text file is complete, the following dialog box appears. To check the content of the text file, click the [Yes] button.

SX-Programmer Standard	
(į)	Exporting from the user ROM file was completeed. Do you want to open the "E:\Program Files\Fuji Electric\SX-Programmer Standard\PLC_Program\data01.TXT" file?
	Yes No

<Text file format to output>

The file format to output is shown below. Use your text editor to show it.



(11) Password

This button is used to set a password.

The password has the following two functions.

1) To set a program as read only

2) To set access level, and limit each operation (Run/Stop, Load, Edit working program) depending on the set access level. For more details, refer to the "Appendix 5."

(11) Calendar

This button is used to show the calendar build-in PLC and make settings of it.



When you open the "Calendar" dialog box, the current date and time of the PLC is displayed.

Click on the part of "year/month/day/hour/minute/second," the display is inverted. Enter a value or click the up and down button on the right to select a value, and then click the [Set] button. The date and time is set in the PLC. Click the [Synchronizes with PC] button to set the date and time in synchronization with your computer.

Even if the PLC is disconnected, this date and time is retained and updated by the PLC battery. The setting range is 1970/01/01 00:00:00 to 2069/12/31 23:59:59.

(13) Redundancy Control

This button is used to replace a CPU to be connected and switch between a working CPU and a standby CPU in a redundant system.

Redundancy Control	
Connected CPU	S <u>w</u> itch Close

(14) Execution time

This button is used to measure the execution time and execution cycle of a program. For more details, refer to "2-5-11 Task execution time measurement."

2-5-3-2 Failure Diagnosis button

When you click this button, the "Failure diagnosis" dialog box opens. The failure diagnosis function displays the failure status of the PLC.

Resource(CPU0)			
Stop : Fatal failure			
System construction error(*)		Eailure diagnosis	
TERM	UROM		
💿 <u>B</u> atch opera	ation	OI	ndividual operation
Stop			Initial run
Run	Reset		Reset
Loa <u>d</u> to PL	Load to PLC Load from		.oad fro <u>m</u> PLC
Verify with F	Verify with PLC		Clear
User ROM	1	Password	
C <u>a</u> lendar		Redundancy control	
Close			
	Ĺ	ļ	

Failure diagnosis				
Selection User definition composition	All module System RAS	Power s	upply determination Bus transmis	sion
System configuration CPU : CPU-0 : High Performance CP Transformation COM : CPU-8 : P Link(normal drive) : Direct I/0 : SX Station-1 : Ry Output Direct I/0 : SX Station-1 : Ry Output	Level Contents	<u>R</u> AS history	Current RAS	_
(∰ Direct I/U : SX Station-2 : DC/AC Inp	[Resource information] -Stop -Fatal failure Application er -> System definition e -> System constru -Can be fail-soft operation & -Processor bus master CPU -SX bus master CPU [Resource SW information]	ror(*) error(*) cition error(*) cindividual reset.		
	-Rotary SW CPU No. : 0 -There is User ROM installa -key State :TERM [Resource information in co -CPU0 Fatal failure, drop ou	ation. nfiguration] ut(*)		~
	<u>I</u> ext Retrieval			Retrjeval
File save File view File delete	Check Configuration	ailure analysis		<u>H</u> elp

(1) Display overview

The "Failure diagnosis" dialog box consists of the system configuration display section and the diagnostic information display section.

The system configuration display section shows in which module a failure occurred in visual form.

The diagnostic information display section shows failure information in detail.

The display contents are refreshed (updated) automatically at fixed intervals.

Configuration display selecti	on History information selection
Failure diagnosis	
Composition : User definition composition I	All module Power off Ethernet Information System RAS Fatal failure Bus transmission
CPU : CPU-0 : SPH2000-256E(Fata POS : SX Station-1 : High Speed Cc	Contents : RAS history Current RAS
System configuration display	-Fatal failure Application error(*) -> System definition error(*) -> System construction error(*) -Auto running mode -Can be fail-soft operation & individual reset. Processor bus master CPU -SX bus master CPU
•	Find text : Find
File save File view File delete Che	eck Configuration Failure analysis Close Help
RAS information file operation	[Failure analysis] button
	[Check configuration] button Performs a text search in the [Contents] box.

- System configuration display section ⇒ Displays the system configuration in a tree form. A mark is displayed on the icon at failure positions. (Fatal fault: , Nonfatal fault: , Fatal and nonfatal faults: .
- Diagnostic information display section ⇒ Displays the system RAS and detailed RAS as text data.
- Configuration display selection ⇒ Choose "Bus connection composition" or "User definition composition." The default setting is "User definition composition."
- History information selection ⇒ Choose "Current RAS", "1 previous generation", "2 previous generations", or "3 previous generations." The default setting is "Current RAS."
- [File save] ⇒ Saves the RAS information file.
- [File view] ⇒ Displays the RAS information file.
- [File delete] ⇒ Deletes the RAS information file.
- [Check configuration]
- Checks whether the module configuration registered in the system definition matches the actual configuration and indicates the mismatch items.
- [Failure analysis]
 Analyzes the status of the PLC system and displays error description, location and remedies.
- [Help] ⇒ Displays Help of the failure diagnostic function.

(2) System configuration display section

The system configuration display section has the following two modes, selectable from the "Configuration" combobox.

1) User definition composition

System configuration information that is set in the system definition and then loaded to the PLC by the user is displayed in a tree form.

Data is displayed by loading the system configuration information from the CPU.

2) SX Bus connection composition

Actual configuration of modules connected to the SX bus is loaded from the CPU and displayed in a tree form. Only modules directly connected to the SX bus are displayed in order of the SX bus station number. For the CPU and processor link module, the SX station number and the CPU number are displayed.

Configuration display selection

Composition : User definition composition 💌 👘	All module	Power off	Ethernet Information
_	System RAS	Fatal failure	Bus transmission
 ☐ ∰ System configuration ☐ CPU : CPU-0 : SPH2000-256E(Fata ☐ POS : SX Station-1 : High Speed Cc 	Contents :	RAS history	Current RAS
System configuration display	-Stop -Stop -Fatal failure Application -> System definition -> System cons -Auto running mode -Can be fail-soft operation -Processor bus master CP -SX bus master CPU (Resource SW informatio -Rotary SW CPU No.: 0 -key State :TERM (Resource information in -CPU0 Fatal failure, drop	error(*) n error(*) truction error(*) n & individual reset. PU n] configuration] out(*)	
	-MAC Address :00-40-1A	-11-5F-88	
	Find text :		✓ Find

<Display specifications>

- If a system fault is detected, a mark corresponding to the degree of the fault is displayed on the icon.
- (Example: Fatal fault: 🕵 Nonfatal fault: 👩 Fatal and nonfatal faults: 👧
- Icon display for modules is the same as that for the system definition.
- "Base board" and "Power supply" are not displayed.
- The default setting of the configuration display selection is "User definition composition." If "User definition composition" does not exist (if the system definition has not yet been downloaded), "SX bus connection composition" is displayed.
- At the time of initial display, the CPU module (CPU number: 00) is selected.
- If communication is disconnected during RAS information display, a blank is displayed.

(3) Diagnostic information display section

The failure diagnostic display section displays detailed fault information for the module selected in the system configuration display section.

Bus transmission
Current RAS
<u> </u>
information display
AS, detailed RAS)
_

<Display specifications>

- The display contents are grouped by tabs. The items of each tab depends on the selected module.
- The starting tab is "System RAS," which displays the system RAS information in the CPU module (CPU number: 00) at the time of initial display.
- The tabs are displayed in one or two rows depending on the module.
- If communication is disconnected during RAS information display, a message saying "Communication error" appears.
- "Current RAS", "1 previous generations", "2 previous generations", or "3 previous generations" is selected depending on the RAS history. The default setting is "Current RAS."

<History display>

- When the previous RAS ("1 previous generation", "2 previous generations", or "3 previous generations") is selected as RAS history, the fault history data is loaded from the CPU and then displayed.
- If there is no history data (all 0s), the following display results.
- <Message data display items>
 - RAS with "message + value": Same display as the case where there is history data.
 - RAS with "message only": "No data" is displayed.
 - <Binary data display items>

Displays all 0s.

<Search function>

- The text search combobox and the search start button are provided at the bottom of the diagnostic information display section, allowing text search for the contents currently displayed in the diagnostic information display section.
- The search start position is the row at the current cursor position in the diagnostic information display section. When the cursor is not displayed, it is the top position.
- The search direction is Downward only. The cursor move to the row containing a matched character string.
- Each item name of the selected tab is automatically inserted in the "Text Retrieval" list box, making it easier to jump to each item.
- When search character strings are entered, up to five search character strings are memorized, allowing you to perform search again using a previously used search character string even after activation of failure diagnosis next time. When the number of search character strings exceeds five, the oldest one is deleted.

(4) RAS information file operation

The information in the Failure diagnosis dialog can be saved in a disk file. The RAS information file can be displayed and deleted. Each operation can be performed using each file operation button in the Failure diagnosis dialog box.

1) File save

This button is used to save the data displayed in the Failure diagnosis dialog in a file.

- ◆ Click the [File save] button on the "Failure diagnosis" dialog box. The "Save RAS File" dialog box opens.
- Specify the target location and each item and then click the [Save] button. The data are saved in the specified file.

Save in: 🥃 (C:)	💌 🖻 🧕	1 🖻 🔳
D300win My Documents Other Program Files Project Windows		
File <u>n</u> ame: Res_dia	g	<u>S</u> ave
Save as type: RAS file	(*.ras)	Cancel
Preservation item-		
System config	uration information	
• AI	\bigcirc <u>U</u> ser definition \bigcirc SX bus connected by the set of the set	ction compositio
🔽 Diagnosis deta	ils	
All <u>m</u> odules	\mathbb{C} Selection module \mathbb{C} Only the disp	olay dat
Dump list of sy	stem memory	Help
-		

<Preservation item>

Specify the data to be saved using "System configuration information", "Diagnosis details", and "Dump list of system memory." By default, "User definition" is selected for "System configuration information" and "Selection module" is selected for "Diagnosis details".

- System configuration information
 - The contents in the system configuration display section are saved. Select "All," "User definition," or "SX bus connection composition."
- Diagnosis details
 - The contents in the diagnostic information display section are saved. Select "All modules," "Selection module," or "Only the display data."
- Dump list of system memory
 - System memory data are saved as hexadecimal text data.

2) File view

- This button is used to display the contents of a RAS information file.
- ♦ Click the [File view] button in the "Failure diagnosis" dialog box. The "View RAS file" dialog box opens.
- Specify a target RAS information file and then click the [View] button. The specified RAS information is displayed.

View RAS file
Look jn: 🖃 (C:)
D300win Res_diag My Documents Other Program Files Project Windows
, File <u>n</u> ame: Res_diag <u>V</u> iew
Files of type: RAS file(".ras)
View RAS file
RAS file name: C:\Res_diag.RAS
BAS information:
IRAS information file) Resource name: Resource File save the date: 2003/08/05 17:09:05
***** System configuration information *****
[User definition composition] System configuration +CPU : CPU-00 : High Performance CPU117(normal drive) : NP1PS-117 +Direct I/0 : SX Station-01 : DC/AC Input 16points(normal drive) : NP1X1606-W +Direct I/0 : SX Station-02 : Sink Output 16points(normal drive) : NP1Y16T09P6
[SX bus connection composition] System configuration +Direct I/D : SX Station-01 : *Digital Input 16points(normal drive) +Direct I/D : SX Station-02 : *Digital Output 16points(normal drive) +CPU : CPU-00 : High Performance CPU117(normal drive) : NP1PS-117
***** Diagnosis details information *****
Qlose

3) File delete

This button is used to delete a RAS information file.

- ♦ Click the [File delete] button in the "Failure diagnosis" dialog box. The "Delete RAS file" dialog box opens.
- Specify a target RAS information file and then click the [Delete] button. The specified RAS information file is deleted.

Delete RAS f	ile			?×
Look jn: 🧰	(C:)	•	E 💆	
D300win My Docum Dther Program Fi Project Windows	ients les			
File <u>n</u> ame:	Res_diag			<u>D</u> elete
Files of type:	RAS file(*.ras)		•	Cancel

4) Format of save file

The file name and data formats for RAS information files are shown below. The file name is "****.RAS" (**** is specified by the user) and data are all text data. Data are saved in order of the configuration information data and the diagnostic information data.

<Save data>

System configuration type	"SX bus connection composition" or "User definition"
Configuration information data	Tree information title "** tree information **" Row 1 data Row 2 data : : Last row data
Diagnostic information data (for each tab information)	Diagnostic information title "** Diagnostic Information **" RAS history (Current, 1 previous generation, 2 previous generations, and 3 previous generations) 1st tab name Data in the 1st tab 2nd tab name Data in the 2nd tab : Last tab name Data in the last tab

(5) Configuration check function

If the system configuration registered in the system definition does not agree with the actual configuration, a fatal fault occurs in the system, which cannot start to run. In this case, a "System configuration error" message is displayed on the system RAS. To operate the SX system normally, it is necessary to match the system definition with the actual configuration.

- Click the [Check Configuration] button on the "Failure diagnosis" dialog box. The "Check Configuration" dialog box opens.
- On the dialog box, the contents of the module registration in the system definition and the actual configuration are displayed. If there is a mismatch between them, the mismatch spot is displayed in red.

Failure diagnosis	×
Composition : User definition composition I	All module Power off Ethernet Information System RAS Fatal failure Bus transmission
POS : SX Station-1 : High Speed Cc	Contents : RAS history Current RAS [Resource information] -Stop -Fatal failure. Application error(") -System definition error(") -Auto running mode -Can be fail-soft operation & individual resetProcessor bus master CPU -SX bus master CPU (Resource SW information] -Rotary SW CPU No. : 0 -key State :TERM [Resource information in configuration] -CPU0 Fatal failure, drop out(")
	[Network Information] -MAC Address :00-40-1A-11-5F-B8 Find text : Find
File save File view File delete Check	Configuration Failure analysis Close Help



* The above example shows that a module that has not been registered in the system definition exists in the actual configuration.

<Differences of SX bus station numbers between user definition composition and bus connection composition>

If the SPH system is reset when a system configuration error occurs due to a configuration definition mistake or module failure, etc., numbers beginning with 1 are assigned to the SX bus stations in their connected order on "bus connection composition" box. Note that if the CPU or power supply is reset due to a system configuration error after arbitrary SX bus station numbers are set as shown in the figure below, the SX bus station numbers of "user definition composition" do not match those of "bus connection composition".

In the example below, different SX bus station numbers are displayed as follows:

DC/AC input 16 points Relay output 16 points Sink-type output 16 points Ethernet module

User definition composition: 10 ↔ Bus connection composition: 1 User definition composition: 20 ↔ Bus connection composition: 2 User definition composition: 30 ↔ Bus connection composition: 3

User definition composition: 1 ↔ Bus connection composition: 4



<Measures>

- 1) To match "user definition composition" with "bus connection composition", it is recommended to assign SX bus station numbers in their connected order.
- 2) Even if an error occurs in the system during operation, "user definition composition" matches "bus connection composition" until the system is reset. Perform failure diagnosis before resetting the system.

(6) Failure analysis function

This function automatically analyzes the status of the PLC system from the system memory and RAS information in the CPU and displays the error description, cause, remedies and location. Note: This function can be used only with SPH300 series of CPUs.

1) Example of displaying failure analysis results

🔁 Failure analysis	<u>-o×</u>
	Close
Failures were detected as follows	
The system configuration definition is different from Battery error. (Decrease in voltage Or no battery)	n an actual configuration.
	Error description display area All the errors detected in the PLC system are displayed. By clicking each error description, the remedies, fatal failure information and failure position of the error are displayed.
Check the following items	
 Please confirm the system configuration again to 2. Is the SX bus number of the module with the SX Is the type of the mounted base board the same 4. Please confirm the setting of the SX bus number 	Remedy display area The probable causes and remedies of the error selected on the "error description display area" are displayed.
Fatal Failure	
System definition error. SX bus module group type not mat System definition SX station number 2	Fatal failure information display area If the error is a fatal failure, its name, cause and time of occurrence are displayed. If the error is a nonfatal failure, this area is not displayed.
System defini Module type OxO2	tion Real configuration 0x04
Fatal Failure Failure Position	.::
Click the tab to change over the window.	
Failure Position	
User Definition System Configuration CPU : CPU-0 : High Performance CPU32 : NP Direct I/0 : SX Station-1 : DC/AC Input 16point Direct I/0 : SX Station-2 : Sink Output 16point Direct I/0 : SX Station-3 : AC100 Input 8points	Substant Connection System Configuration CPU : SX Station-254(CPU-0) : High Performs Direct I/0 : SX Station-1 : *Digital Input 16poir Direct I/0 : SX Station-2 : *Digital Output 32pc Failure position display area The failure position is displayed.

2) Display specifications of the failure analysis screen

◆ Click the [Failure analysis] button to perform failure analysis and display the result.

	[Resource information] -Stop -Fatal failure Application error(") -> System definition error(") -> System construction error(") -Auto running mode -Can be fail-soft operation & individual reset. -Processor bus master CPU -SX bus master CPU (Resource SW information] -Rotary SW CPU No. : 0 -key State :TERM (Resource information in configuration] -CPU0 Fatal failure, drop out(")
	[Network Information] -MAC Address :00-40-1A-11-5F-B8
File save File view File delete Check	Configuration Failure analysis Close Help

Failure analysis Failures were detected as follows The system configuration definition is different from	If two or more errors occur at the same time, description of all the errors are displayed in the "error description display area." In the "Remedy display area" and "Fatal failure information/failure position display area," information about the currently selected error is displayed.
Battery error. (Decrease in voltage,Or no battery)	
🕫 Failure analysis	
	Close
Check the following items Failures were detected as follow	s
1. Please confirm the syst The system configurat	ion definition is different from an actual configuration.
2. Is the SX bus number of Battery error. (Decreased)	se in voltage,Or no battery)
3. Is the type of the mount	
4. Please confirm the setti	
	\checkmark
Fatal Failure	
System definiti Check the following items	
1 Please confirm mo	inting the battery
SX bus module group 2. Please exchange it	or a new battery when abnormality occurs even if it is mounted normal
	,,
System definition SX	
) (
Module type Failure Position	
日 西 Sustem Configuration	
	h Performance CPU32 : NP1PS-32
	ation-1 : DC/AC Input 16points : NP1X1606-W
Fatal Failure Failure Position	ation-2 : Sink Output 16points : NP1Y16T09P6
Analysis done.	ation-3 : AUTUU Input 8points : NPTXU8TU
	/

Note 1: If two or more fatal failures occur, only the description of the first detected error is displayed on the "fatal failure" tab window.

<Display specifications of the failure analysis screen>

1) Icon

lcon	Description	
٢	Fatal failure has occurred.	
٠	Nonfatal failure has occurred.	
Q!	Both fatal and nonfatal failures have occurred.	
1	Set as "no equipment" in the system definition.	

2) Display color

Display color and example	Description
Backgorund color: yellow, Text color: black	This module is disconnected. (or fatal failure has occured.)
Backgorund color: yellow, Text color: black Direct I/0 : SX Station-2 : Sink Output 16points : NP1Y16T09P6	This module is registered in the system definition, however, does not exist in the actual configuration.
Backgorund color: gray, Text color: blue Direct I/0 : SX Station-2 : *Digital Output 32points	This module exists in the actual configuration, however, is not registered in the system definition.

3) Automatic execution of failure analysis

If an error occurs in the system, failure analysis can be automatically executed by simply clicking the [Failure diagnosis] button.

Resource(CPU0)							
	Stop : Fatal failure						
System construc	tion error(*)		<u>F</u> ailure diagnosis			
TERM	UROM						
💿 <u>B</u> atch opera	tion	OI	ndividu	al operation			
Stop	Stop		I <u>n</u> itial run				
Run		Reset					
Load to PLO		Load from PLC		m PLC			
Verify with P	LC	Clear					
User ROM	User ROM		Password				
C <u>a</u> lendar		Rec	Jundano	cy control			
Close							



		_
		1
		∽
~	、 <i>、</i>	/
	\sim	

🔊 Failure analysis		
Failures were detected as follows		
The system configuration defi	nition is different from an actu	al configuration.
Check the following items		
1. Please confirm the system	configuration again by [Check	configuration] in the failure dia 🛃
 Is the SX bus number of the 3. Is the type of the mounted 	e module with the SX buse nu base board the same as the ba	mber (POD, servo, I/O termina ase board in the svstem definiti
4. Please confirm the setting (of the SX bus number of the n	nodule with the SX bus number
	modules been turned on?	
Fatal Failure		
System definition	error	2009-08-12-00:45:37.000
System definition	CIIOI	
Number of SX bus mod	dule error	
Number of connect	System definition 4	Real configuration
Mander of connect	1	_
		~
Fatal Failure Failure Position		
Analysis done.		.:

<How to set>

Click [Tool] menu > [Option]. The "Options" dialog box opens.
 Select "Online" from the category, and check "Show the failure analysis automatically."

Category	
Lategory: General Directories Project Online Conversion Backup	PLC Operation Image: Show the failure analysis automatically Image: Permit the use of Initial Run Monitor Image: Verify before the monitor is started Load to PLC Image: Permit load to PLC only the program Image: Permit load to PLC only the program Load the changed program into PLC Image: Show the confirmation before download to PLC Load from PLC Automatic import of the Ex.FB Import automatically Import automatically Import without a confirmation message automatically
	Import without a confirmation message automatically

2-5-4 Online - Monitor

This command is used to monitor the PLC online. During online monitoring, you can check the ON/OFF status of PLC contacts and coils, and the usage of the device memory.

Ladde	r 0* PG0000	1							-	×
1		M1							M10	^
		-3 _ L								
	м10 —][—									
	тО							441ms		
2							TON	TO	5000ms-	
з	т0] [M20	м24						M20	-
	тО	M20								
4	E		J			🕑 When	the F1 key is pu	shed, the guidan	ce is displayed.	

* During the monitoring, you cannot edit the program by default. To edit a program that is being monitored, click [Tool] menu > [Option]. Then, on the "Options" dialog box, select "Online" from the category, and check "Allow editing of being monitored."

2-5-5 Online menu- Load the changed program into PLC

This command is used change a PLC program partly online (online program change function). This function is available when you open the same project as the PLC and make a change to the program. Only the changed program is loaded to the PLC. A program can be changed either when the PLC is working or stopped. The CPU key SW must be set at TERM.

SX-Prog	rammer Standard	X
₹	Do you wish to load the changed program into PL Care should be taken when downloading. This could couse PLC to stop through a program e	C? error.
	Neither the tag data nor the line comment are do	wnloaded on this function.
	Yes No	
	$\overline{\Box}$	
SX-Prog	rammer Standard 🛛 🛛 🕅	
2	Load Changed Program to PLC was completed.	
\checkmark	Do you start the monitoring?	
	Yes <u>N</u> o	

If you have performed any of the following operations, the "Load the changed program into PLC" command cannot be used.

- Changing the system definition
- Changing the task property
- Adding/removing the task
- Adding a program to the task
- Adding an unassigned program to the task
- Moving a program under the task to Unassigned Programs
- Changing a program name
- Changing a program number
- Changing a function block number
- Adding/changing/removing a function block parameter
- Deleting a program
- Deleting a function block
- Adding/changing/deleting an initial value
- Importing an initial value
- Adding/changing/deleting Array, Structure definition

Note 1: When you execute the "Load the changed program into PLC" command for SPH300 CPU, an available program space of 8192 or more steps is required in the CPU.

When you execute the "Load the changed program into PLC" command for SPH200 CPU, an available program space of 4096 or more steps is required in the CPU.

2-5-6 Online menu - Data modify

This command is used to modify data memory of the PLC online. Data memory can be modified either when the PLC is working or stopped. The "Data modify" command has the following two functions: [Data modify] and [Force ON/OFF].

• [Data modify]:

This function is mainly used to change the internal memory data.

Input address data cannot be changed by this command.

Output address data can be changed by this command. However, this command can be executed only once. When the CPU is working and the output address is used as a coil or specified as a transfer destination in the program, it is overwritten by program operation. This is also true for the internal memory.

Example of data modification (Word)

Example of data modification (Bit)

Data Modify	X
м	10
⊙ ON	O OFF
Set	Close

Data Modify		X
	WL100	
Value : 150		
<range can<="" td="" that=""><td><u>S</u>et</td><td>Close</td></range>	<u>S</u> et	Close
-32767 - 65535 H0000 - HFFFF		

• [Force On/Off], [Forcible setting cancel], [Forcible setting all cancel]:

These commands are used to forcibly set ON or OFF an I/O memory, or cancel the forcible ON/OFF setting. The status of the forcible ON/OFF is cancelled by canceling operation from the loader, turning ON/OFF the CPU power, and resetting the CPU. It is not canceled by stopping and starting the CPU.

Forcible ON/OFF setting of the internal memory is not possible.

Example of Forcible setting

Force Set	
×1	.0
⊙ ON	O OFF
<u>S</u> et	Close

- * SPB, Board (SPB) does not support the force On/Off function.
- * In SPH300, if you check "ON" for "Compulsion setting hold state," the forcible ON/OFF setting is not canceled by turning ON/ OFF the CPU power or resetting the CPU. To cancel it, the canceling operation from the loader is necessary.

CPU parameter		
CPU parameter CPU running definition Memory allocation setting 1/0 group setting Fail-so Watch Dog Timer setting Default Specify WDT time 4095 ms Bunning specification at power on RUN=Run/TERM=Run RUN=Run/TERM=Last State RUN=Stop/TERM=Stop Compulsion setting hold state OFF(Not hold) (Using it with <ctrl> + <alt> +</alt></ctrl> (F12> key becomes possible. 	ft operation setting	
User ROM run	<u> </u>	Cancel <u>H</u> elp

Data type	Input range	Input example
BIT (BOOL)	ON, OFF	ON, OFF
INT	-32768 to 32767	INT#123, 123
DINT	-2147483648 to 214748647	INT#123, 123456
UINT	0 to 65535	UINT#123
UDINT	0 to 4294967295	UDINT#123456, 123456
REAL	$-2^{128} < N \le -2^{-126}, 0, 2^{-126} \le N \le 2^{128}$	1.23, 1.3E-5
TIME	0ms to 4294967295ms 0ms to 49d17h2m47s295ms	TIME#10s, 10000
DATE	1970-01-01 to 2106-02-07	2000-12-31, DATE#2005-04-01
TOD	0:00:00 to 23:59:59	17:15:00, TOD#12:12:12
DT	1970-01-01 to 2106-02-07-6:28:15	2005-2-14-12:23:00, DT#2005-11-03-00:10:03
STRING	Impossible to input	-
WORD	H0000 to HFFF	H1234
DWORD	H00000000 to HFFFFFFF	H12345678

<Data format to be entered into new value>

2-5-7 Online- Break Point

The break point function is used to stop execution of the PLC under specified conditions. There are two types of break points: [Break point] and [Condition break point]. In SPH200/300, only one point can be set (either of the two types of break points). In SPH2000/3000, up to 32 points can be set (total of the two types of break points). After stopping the PLC, you can execute the program step by step using "Step Execute" function. You can also restart the program from the stop position.

To use the break point function, set the CPU key switch at TERM, and load the program to the PLC if it has been changed after connected online.

When you perform any of the following operations, the break point is canceled.

- Stopping the PLC (SPH300 only)
- Setting the CPU key switch to any position other than TERM
- Turning ON/OFF the CPU power or resetting the CPU

<Functions of break point>

Function Sp		Specification	SPH200 /300	SPH2000 /3000
Multi-point	breakpoint	Up to 32 points of break points can be set for one project.	х	>
Logical con condition	ncatenation of break stop	For one device, up to 4 points of break stop conditions by a specified value of data can be concatenated with AND or OR.	х	>
Break point		After an instruction set as the breakpoint is executed.	~	>
Condition break point	Bit (BOOL) data match (=1, =0)	=1: When the specified bit (BOOL) data is turned ON=0: When the specified bit (BOOL) data is turned OFF	~	→ *
	Rising/falling edge of bit (BOOL) data	Rising edge: When the specified bit (BOOL) data is changed from OFF to ON. Falling edge: When the specified bit (BOOL) data is changed from ON to OFF.	~	✓ *
	Data comparison match	When the specified data meets the specified conditions Comparison conditions (=, <>, <, >, <=, >=)	~	✓ *
	Reading/writing to data (READ/WRITE)	After reading to the specified data After writing to the specified data	~	Х

* When a specified device is executed, a judgment on the condition is made.

<The buttons concerned with Break Point>

The buttons concerned with break points are shown below.



• [Break Point]:

This button is used to set a break point for the instruction at the cursor position.

• [Condition Break Point]:

This button is used to set a break point for the address at the cursor position with a condition.

• [Step Execute]:

This button is used to execute the program stopped by the break point step by step. FB contents are not executed step by step, but in a normal way.

• [Step in to function block]:

This button is used to execute the program stopped by the break point step by step. FB contents are also executed step by step.

• [Execute from the stopping direction]:

This button is used to restart the program stopped by the break point from the stop position.

• [Break point window]:

This button is used to open the "Breakpoints" window.

<Break Point>

A break point targets instruction positions. The cursor position at the time of execution of this function becomes a break point. The instruction specified as a break point changes its back color to pink to indicate the break point.

Place the program window into a monitoring state and select a device to be set as a break point. Then, click [Online] > [Break point] > [Break point] to set a break point (the background color is pink.). Program execution will be stopped at the break point. (the background color is turned into yellow)



<Condition break point>

Devices that can be set as a trigger point is the I/O memory, standard memory, retain memory, system memory, user FB memory, and system FB memory (T, C, TR).

Place the program window into a monitoring state and select a device to be set as a break point. Then, click [Online] menu > [Break point] > [Condition break point]. The following dialog box opens. Select a stop condition, and then click the [Set] button to set the condition break point.

<Bit (BOOL) data>

Condition Breakpoint		X
	M20	
<u>B</u> reak Condtion : <u>C</u> ompare Data :	Rising	~
	<u>S</u> et	Close

Select stop condition from the following: =1, =0, rising or falling

<Word/double-word data>

Condition Breakp	oint	
	WM150	
Break Condtion :	=	~
<u>C</u> ompare Data :	1234	
	Set Close	
<range be="" can="" se<br="" that="">-32767 - 65535 H0000 - HFFFF M01655337</range>	et>	^
WM0WM65533		_
DM0DM65532		
L0L8091F		
WL0WL8091		
DL0DL8090		
SNOSN511F		
WSRUWSR511 DCRODCR510		~
05807-058510		

Select stop condition from the following:

=, <>, <, >, <=, or >=.

As comparable data, 10 digits, 16 digits, word address, or double word address shown on the list can be set .

You can check the registration status of break points on the "Breakpoints" window.


<Condition break point for SPH2000/3000>

In SPH2000/3000, when a device at the specified line position is executed and it is set as a stop condition, the execution is stopped. Even if there are many same devices (M0) as shown below, the break condition is that M0 is ON when the specified line position "Line Number 5 - 1" is executed.



Breakpoints		
🗙 📡 🖾 D- D- 🖅 👘		
Position	Condition	
🛃 Ladder1 Line Number 5 - 1	M0 = 1	

<Logical concatenation of break points> (for SPH2000/3000 only)

In SPH2000/3000, up to four points of break stop conditions by a specified value of data can be concatenated with AND or OR for one variable.

<Concatenation setting example>

The following explains how to set a break condition to stop the program when the device "WM2" is 1000 or 2000<=WM2<=3000.

◆ First, set the condition of "WM50=1000", "WM50>=2000", and "WM50<=3000".

Breakpoints	
🗙 👰 🍒 D- D- 🖅 🦳	
Position	Condition
📃 Ladder1 Line Number 7 - 2	WM50 = 1000
📃 Ladder1 Line Number 7 - 2	WM50 >= 2000
🔽 Ladder1 Line Number 7 - 2	WM50 <= 3000

◆ Link "WM50>=2000" and "WM50<=3000" by AND condition.

Click "WM50>=2000" and "WM50<=3000" while pressing the <Ctrl> key. While selecting these two click the [AND] button.

Breakpoints	$1 \sim 10^{-10}$
🗙 🙊 🖾 🕞 🖸 🖃 👘	
Position AND	button tion
Ladder1 Line Number 7 - 2	WM50 = 1000
📃 Ladder1 Line Number 7 - 2	WM50 >= 2000
🔽 Ladder1 Line Number 7 - 2	WM50 <= 3000

◆ "WM50>=2000" and "WM50<=3000" are linked by AND condition.

Breakpoints	
🗙 📡 🍒 D- D- 🖅 🦳	
Position	Condition
📃 Ladder1 Line Number 7 - 2	WM50 = 1000
📃 Ladder1 Line Number 7 - 2	WM50 >= 2000
🔽 Ladder1 Line Number 7 - 2	WM50 <= 3000
Ladder1 Line Number 7 - 2	(WM50 >= 2000 AND WM50 <= 3000)

♦ Link ("WM50>=2000" and "WM50<=3000") and "WM50=1000" by OR condition. Click ("WM50>=2000" and "WM50<=3000") and "WM50=1000" while pressing the <Ctrl> key. While selecting these two, click the [OR] button.

Breakpoints		
🗙 👰 🖪 🗈 🖸 🖅		
Position	OR button	n
📃 Ladder1 Line Number 7 -	2 WM50 = 1	1000
📃 Ladder1 Line Number 7 -	2 WM50 >=	: 2000
🔽 Ladder1 Line Number 7 -	2 WM50 <=	: 3000
📃 Ladder1 Line Number 7 -	2 (WM50 >	= 2000 AND WM50 <= 3000)

♦ ("WM50>=2000" and "WM50<=3000") and "WM50=1000" are linked by OR condition. Check the box of this line.

Breakpoints	9 X
🗙 📡 🍒 D- D- 🛃 🦳	
Position	Condition
📃 Ladder1 Line Number 7 - 2	WM50 = 1000
📃 Ladder1 Line Number 7 - 2	WM50 >= 2000
🔽 Ladder1 Line Number 7 - 2	WM50 <= 3000
📃 Ladder1 Line Number 7 - 2	(WM50 >= 2000 AND WM50 <= 3000)
📃 Ladder1 Line Number 7 - 2	(WM50 = 1000 OR (WM50 >= 2000 AND WM50 <= 3000))

◆ The following dialog box appears. Click the [Yes] button.



The break point is set.

Breakpoints	$1 \sim 10^{-10}$
🗙 👰 盾 D- D- 🖅 🦳	
Position	Condition
📃 Ladder1 Line Number 7 - 2	WM50 = 1000
📃 Ladder1 Line Number 7 - 2	WM50 >= 2000
📃 Ladder1 Line Number 7 - 2	WM50 <= 3000
📃 Ladder1 Line Number 7 - 2	(WM50 >= 2000 AND WM50 <= 3000)
🔽 Ladder1 Line Number 7 - 2	(WM50 = 1000 OR (WM50 >= 2000 AND WM50 <= 3000))

<Canceling break point>

To cancel a break point, uncheck the box on the "Breakpoints" window.

Breakpoints		
🗙 📡 🍒 Ð- Ð- 🖅 🦳		
Position	Condition	
🔽 Ladder1 Line Number 5 - 1	M0 = 0	
		$\overline{\langle}$
		•
Breakpoints		
🗙 👰 🔏 D- D- 🖅 🦳		
Position	Condition	
Ladder1 Line Number 5 - 1	M0 = 0	

<Step Execute>

This function is used to execute a program in units of instructions, starting from the break point. There are two types of step execute buttons.



[Step in to function block]: By clicking button, instructions of a program are executed one by one. When a user FB is on step execute position, the FB contents are also executed one by one.

<Execute from the stop position>

This function is used to restart execution of a program stopped by a break point from the stop position. The program restarts from the current condition.

When the break point is not canceled and the break condition is met, the program is stopped again.

2-5-8 Online - condition monitor

The condition monitor function is used to capture up to 512 points of devices based on the specified trigger point condition. Although the monitoring is stopped, the program continues working. Register an address to capture first, otherwise, condition monitor results cannot be displayed.

To use the condition monitor function, set the CPU key switch at TERM, and load the program to the PLC if it has been changed after connected online.

When you perform any of the following operations, the condition monitor is canceled.

- Setting the CPU key switch to any position other than TERM
- Turning ON/OFF the CPU power or resetting the CPU
- Stopping the monitoring.
- Switching between working and standby CPUs.

<Available monitoring stop conditions>

Function		Specification		SPH2000 /3000
Multi-point	condition monitoring stop	For one project, up to 32 points of condition monitoring stop points can be specified.		~
Logical concatenation of monitoring stop conditions		For one device, up to 4 points of monitoring stop conditions by a specified value of data can be concatenated with AND or OR.		>
	Program address stop	After an instruction set as the breakpoint is executed.	х	>
Monitoring stop condition	Bit (BOOL) data match (=1, =0)	=1: When the specified bit (BOOL) data is turned ON=0: When the specified bit (BOOL) data is turned OFF	х	✓ *
	Rising/falling edge of bit (BOOL) data	Rising edge: When the specified bit (BOOL) data is changed from OFF to ON. Falling edge: When the specified bit (BOOL) data is changed from ON to OFF.	~	✓ *
	Data comparison match	When the specified data meets the specified conditions Comparison conditions (=, <>, <, >, <=, >=)	х	✓ *

* When a specified device is executed, a judgment on the condition is made.

<The buttons concerned with condition monitor>

The buttons concerned with condition monitor are shown below.



- [Execute condition monitor]:
 - This button is used to execute condition monitor.
- [Finish condition monitor]:
 - This button is used to exit from condition monitor.
- [Stop on the cursor position]:
 - This button is used to set a trigger of condition monitor at the cursor position.
- [Condition stop]:
 - This button is used to set a condition for the address at the cursor position and stop by the condition.
- [Monitor device registration]:
 - This button is used to register a device to monitor during the condition stop.
- [Condition monitor window]:
 - This button is used to open the "Condition Monitor" window.

Follow the procedure below to execute condition monitor.

- 1) Monitor device registration
- 2) Trigger setting (Finish on the cursor position, or condition stop)
- 3) Condition monitor execution

<Monitor device registration>

Up to 512 points of devices can be registered.

Place the program window into a monitoring state and select a device to register.
 Click [Online] menu > [Condition monitor] > [Register device], and then the monitor device is registered.

Condition Moni	itor		д . х
X 🖗 🎼	D D 🗐		
Trigger Point	Monitor Device		
Variable		Instance	
🗹 DM22		RESOURCE:DEFAULT:Ladder2	
🗹 м20		RESOURCE:DEFAULT:Ladder2	
🗹 WM40		RESOURCE:DEFAULT:Ladder2	
🗹 WM50		RESOURCE:DEFAULT:Ladder2	

<Stop on the cursor position>

This button is used to make settings so that the monitoring is stopped when the instruction at the cursor position is executed.

Place the program window into a monitoring state and select a device to stop monitoring.
 Click [Online] > [Condition monitor] > [Trigger setting] > [Cursor Position Stop]. The monitor stop device is set.

Condition Moni	tor 🗸 🖓 🖓	¢
X 🖗 🎉	D D =	
Trigger Point	Monitor Device	
Position	Condition	1
🗹 Ladder2 L	ine Number 4 - 3	

<Condition Stop>

The device which can be set as condition stop is I/O memory, standard memory, retain memory, system memory, user FB memory, and system FB memory (T, C, TR).

Place the program window into a monitoring state and select a device to stop monitoring.
 Click [Online] menu > [Condition monitor] > [Trigger setting] > [Condition stop]. Then, the condition stop is set.

<Bit (BOOL) data>

Set Condition Monitor Trigger		
	M21	
Break Condtion : Compare Data :	Rising	~
	Set Close	

Select stop condition from following: =1, =0, rising or falling

address shown on the list can be set .

<Word/double-word data>

Set Condition Mo	nitor Trigger	
	WM50	
Break Condtion : Compare Data :	= 1234	~
	<u>S</u> et C	lose
<range be="" can="" s<br="" that="">-32767 - 65535 HOOOO - HFFFF MOM655337 WMOW655333 DMODM65533 DMODM65532 LO180418</range>	et>	
NLO		
DSM0DSM510		<u>×</u>

Select stop condition from the following: =, <>, <, >, <= or >= As comparable data, 10 digits, 16 digits, word address, or double-word

You can check the registration status of condition stop on the "Breakpoints" window.

Condition Moni	torenanceanceance	
X 🖗 🎉	Ð Ð 🛃	
Trigger Point	Monitor Device	
Position		Condition
🗹 Ladder2 L	ine Number 2 - 1	M21 Rising
🗹 Ladder2 L	ine Number 5 - 2	WM50 = 1234

* With SPH2000/3000, up to 32 trigger points can be specified. In addition, as with break points, up to 4 triggers can be logically connected for one device. Follow the same procedure used for break points.

<Condition monitor execution>

Place the program window into a monitoring state, and then click [Online] menu > [Condition monitor] > [Condition monitor execute]. The condition monitor is set on waiting for a trigger. When the trigger is approved, the monitoring is stopped.



* When the monitoring is stopped, the status (ON/OFF, device data) of the devices registered for condition monitor is only shown. The status of other devices is not displayed.

<Condition monitor stop>

While the condition monitor is working, to finish the condition monitor and return to the normal monitor, click [Online] menu > [Condition monitor] > [Terminate condition monitor].

2-5-9 Online - Sampling Trace

This function is used to sample and display the status of a specified device (memory address). Note: The sampling trace function is supported by the following CPUs.

- NP1PS-117, NP1PS-117R and NP1PS-74R: software version V61 or later
 - NP1PS-245R: software version V64 or later SPH2000/3000: all versions

<Devices for sampling trace>

The following device can be specified as a sampling device.

	Bit	Word	Double word
Input memory	х	wx	DX
Output memory	Y	WY	DY
Non-retain memory	м	WM	DM
Retain memory	L	WL	DL
System memory	SM	WSM	DSM
Timer	т	-	т
Counter	С	С	-

<Number of points which can be registered>

Up to 32 points of devices can be registered for sampling trace, counting a bit, a word, and a double word as one point.

<Operating procedure>

(1) To register sampling device

Click [Online] menu > [Sampling trace] > [Sampling trace]. The [Sampling trace] dialog box opens. First, specify a device for the sampling trace. Right-click on the area surrounded by a dashed line shown below, and select [Add sample target]



* The devices M, L, and SM can be registered on this dialog box. For other devices, X, Y, T, and C, refer to <Registration procedure during online monitor> explained below.

The address entry box is displayed on the bottom. Enter a device address to sample, and press the <Enter> key. Then, the tag entry box appears. Enter a tag name, and press the <Enter> key. (The tag names is optional.) This tag is different from the tag entered on a program and used only for sampling trace. The list to select the data type appears. Select the data type and press the <Enter> key.



The device for sampling trace is registered. Following the above procedure, add and register other devices for sampling as many as you need.

🖂 Sampling Tra	ce			
i 🛅 💕 • 📓 • I	3	📃 Show	with Tag	
Name of data	Date and time	Sample target	Data type	
		DM2	DINT	
			PPPPPPP	·····
			PPPPPPP	·····
		•		
	Total sample count 0 <= 50	Address		
Sampling settings	Graph view settings			
Trigger condition	on Ad <u>v</u> a	anced Sampled when	Total sample number: 16384 <= 16384	Connect the PLC Execute
		Ostantian (€ Scan end)	0 Irigger point:	Carron cattinger
×		O Period of:	ms	Lonnic securitys
				<u>H</u> eset

* When you trigger sampling trance by the status change of a device, also register the device. When using a manual trigger, the registration is not necessary.

<Notes on registration of a sampling trace device>

The devices M, L, and SM can be registered even offline. You need to register other devices, X, Y, T, and C during online monitor. In addition, the address of the device must be used by a program. Registration procedure during online monitor is explained below.

<Registration procedure during online monitor>

Place the cursor on a device to register as a sampling trace during online monitor, right-click on it, and then select "Register Device to Sampling Trace" from the menu.



(2) Trigger condition setting

 Check a device to set for trigger condition. Check "Trigger condition" and select a device address and condition from the list. (This setting is not necessary when using a manual trigger)

🔤 Sampling Trace	
🖥 📬 • 📮 • 🖹 👘	Show with Tag
Name of data Date and time	Sample target Data type
	DM2 DINT
	M40 BOOL
	Y3.0 BOOL
	CO INT
	M50 BOOL
/	4
/_	
/	
/	
Total sample count 0 <= 50	Address
Sampling settings Graph view settings	
Trigger condition	anced Sampled when Total sam
	Scan and 0 Tri
M50 🗸 Rising Eda 🗸	
<u></u>	

Only one trigger condition can be set.

With SPH2000/3000, up to 4 points of conditions can be combined by AND, OR condition.

<Trigger conditions>

Function		Specification		SPH2000 /3000
Logical concatenation of trigger conditions		For one device, up to 4 points of sampling start conditions by a specified value of data can be concatenated with AND or OR.		~
Bit (BOOL) data match (=1, =0)		=1: When the specified bit (BOOL) data is turned ON=0: When the specified bit (BOOL) data is turned OFF		~
Trigger condition	Rising/falling edge of bit (BOOL) data	Rising edge: When the specified bit (BOOL) data is changed from OFF to ON. Falling edge: When the specified bit (BOOL) data is changed from ON to OFF.	~	~
Data comparison match		When the specified data meets the specified conditions Comparison conditions (=, <>, <, >, <=, >=)	~	~

<Comparison data>

When the trigger condition is specified only with a comparison operational expression (only with word/double-word data), set a comparison data in the comparison data field based on the following table.

Data type	Input range	Input example	Display example after input
BIT (BOOL)	0,1	Cannot be input.	-
INT	-32768 to 32767	INT#123, 123	INT#123 (INT# is prefixed.)
DINT	-2147483648 to 2147483647	DINT#100, 100	DINT#1000 (DINT# is prefixed.)
UINT	0 to 65535	UINT#1000, 1000	UINT#1000 (UINT# is prefixed.)
UDINT	0 to 4294967295	UDINT#1000, 1000	UDINT#1000 (UDINT# is prefixed.)
REAL	Single-precision floating decimal point	REAL#10, 10.0, 1.3E-05	10.0, 1.3E-05 (REAL# is omitted.)
TIME	0ms to 49d17h2m47s295ms (4294967295ms)	TIME#10s, 10s, 1s500ms, 10000ms	10000ms (All values are expressed in millisecond.)
DATE	01-01-1970 to 02-07-2106	DATE#2003-2-1, 2003-02-14	2003-02-14 (DATE# is omitted.)
TOD	0:00:00 to 23:59:59	TOD#17:00:00, 17:00:00	17:00:00 (TOD# is omitted.)
DT	01-01-1970 0:00:00 to 02-07-2106 6:28:15	DT#2003-02-09-4:00:00, 2003-02-09-04:00:00	2003-02-09-4:00:00 (DT# is omitted.)
STRING	-	Cannot be input.	-
WORD	0000 to FFFF	H0000, H1234, HABCD, 0, 1234, ABCD	ABCD (H is omitted.)
DWORD	00000000 to FFFFFFF	H00000000, H12345678, HABCDEF10, 0, 12345678, ABCDEF10	ABCDEF10 (H is omitted.)

* Input values are automatically changed depending on the data type as shown in "Display example after input" in the list above.

<How to cancel trigger condition>

To cancel a trigger condition, follow the procedure below.

♦ Select a blank from the address list of Trigger condition.

🖾 Sampling Tra	ice			
: 🛅 💣 • 📓 •	1		[Show with Tag
Name of data	Date and time		Sample target	Data type
			DM2	DINT
			M40	BOOL
			Y3.0	BOOL
			C0	INT
			M50	BOOL
			٠	
	Total sample count	0 <= 50	Address	×
Sampling settings	Graph view settings			
Tringer and the		<u> </u>		
 I rigger conditi 	on	Advanc	Sampled when	l otal san
			Scan end	
M50 🗸	Rising Edg 💙		O Period of:	ms
МЫ	μ			
E MOU				
			7	
		\sim	/	

♦ Uncheck the box.

🖾 Sampling Tr	ace			
i 📅 🚰 • 📓 -		P		Show with Tag
Name of data	Date and time		Sample target DM2 M40 Y3.0 C0 M50	Data type DINT BOOL BOOL INT B
Sampling settings	Total sample count Graph view settings	0 <= 50	Address	Total san 0 In

♦ The trigger is canceled.

🖂 Sampling Tr	ace			
i 🛅 💕 • 📓 •	F] Show <u>w</u> ith Tag
Name of data	Date and time		Sample target	Data type
			DM2	DINT
			M40	BOOL
			Y3.0	BOOL
			C0	INT
			M50	BOOL
			•	
	Total sample count	0 <= 50	Address	×
Sampling settings	Graph view settings			
Trigger condit	ion	Advar	Sampled when Sampled when Scan end Period of:	ms

<How to set multi-point trigger condition>

You can set multiple trigger conditions and trigger by combination of AND, OR condition. This is called multi-trigger. Only SPH2000/3000 support this function.

• Check the address to set for the target of multi-point trigger. Check "Data condition," and click the [Advanced] button.

🖾 Sampling Trace			
i 🛅 💕 • 🗐 - 🗵	6		Show <u>w</u> ith Tag
Name of data Date and time		Sample target	Data type
		DM2	DINT
		M40	BOOL
		Y3.0	BOOL
		M50	BOOL
		(MOO	DOOL
		•	
	0 . 50	Address	X
I otal sample count	U <= 50	Address	^
Sampling settings Graph view settings			
Trigger condition	Advanc	sed Sampled when	Total san
		Scan end	0 Tri
✓		O Berind of	
<u></u>			

The "Advanced setting" dialog box opens. Select a trigger condition and "Linkage logic" (AND/OR), and then click the [OK] button.

Advanced setting	X
	_
M50 Y Rising Edg Y	
⊙ AND ○ OR	
M40 💉 Falling Edc 🗸	
O AND O OR	
CO 💙 >= 💙 INT#10	0
DM2 💌 <= 💌 DINT#150	0
M50 Rising Edge AND M40 Falling Edge OR C0 >= INT#100 AND DM2 <= DINT#1500	
OK Cancel	

◆ The multi-point trigger condition is set.

Name of data Date and time Sample target Data type ✓ DM2 DINT ✓ M40 BOOL Y30 BOOL Y30 </th <th>Sampling Trace</th> <th></th> <th></th> <th></th>	Sampling Trace			
Name of data Date and time Sample target Data type ✓ DM2 DNT ØODL ✓ M40 BODL Y3.0 BODL ✓ CO INT ✓ Y3.0 BODL ✓ CO INT ✓ ✓ Y3.0 BODL ✓ CO INT ✓ ✓ ✓ ✓ ✓ ✓ M50 BODL ✓ ✓ ✓ ✓ ✓ ✓ ✓	🖥 💕 + 📓 + 🖹	1	[Show with Tag
✓ DM2 DINT ✓ M40 BOOL ✓ Y3.0 BOOL ✓ CO INT ✓ M50 BOOL	Name of data Date and time		Sample target	Data type
✓ M40 BOOL Y3.0 BOOL Y3.0 BOOL Y3.0 BOOL Y0.0 NT Y0.0 BOOL Y0.0			DM2	DINT
Y3.0 BOOL Y3.0 <td></td> <td></td> <td>M40</td> <td>BOOL</td>			M40	BOOL
Image: Constraint of the second of the s			Y3.0	BOOL
Image: Second times and the second times and			🗹 C0	INT
Total sample count 0 <= 50			M50	BOOL
Total sample count 0 <= 50				
Total sample count 0 <=50 Address × Sampling settings Trigger conglition M50 Rising Edge AND M40 Falling Edge 0R C0 >= INT#100 M50 Rising Edge AND M40 Falling Edge 0R C0 >= INT#100 Period of: ms				
Total sample count 0 <= 50 Address × Sampling settings ✓ Trigger condition M50 Rising Edge AND M40 Falling Edge 0R C0 >= INT#100 M50 Rising Edge AND M40 Falling Edge 0R C0 >= INT#100 Period of: ms				
Total sample count 0 <= 50				
Total sample count 0 <= 50				
Total sample count 0 <= 50				
Total sample count 0 <= 50			1	
Total sample count 0 <= 50				
Total sample count 0 <= 50				
Total sample count 0 <= 50				
Total sample count 0 <= 50				
Total sample count 0 <= 50				
Total sample count 0 <= 50				
Total sample count 0 <= 50				
Total sample count 0 <= 50				
Total sample count 0 <= 50				
Total sample count 0 <= 50				
Total sample count 0 <= 50				
Total sample count 0 <= 50				
Sampling settings Graph view settings Image: Construction of the settings Advanced M50 Rising Edge AND M40 Falling Edge OR C0>= INT#100 Sampled when AND DM2 <= DINT#1500	Tatal approla count	0 <- 50	Address	X
Sampling settings Graph view settings Image: Condition Advanced M50 Rising Edge AND M40 Falling Edge OR C0 >= INT#100 Sampled when Image: Condition Scan end Image: Condition Period of:	i otal sample count	U <=)U	Address	
✓ Trigger condition Advanced M50 Rising Edge AND M40 Falling Edge OR C0 >= INT#100 Sampled when Scan end Scan end Period of: ms	Sampling settings Graph view settings			
M50 Rising Edge AND M40 Falling Edge 0R C0 >= INT#100 AND DM2 <= DINT#1500	Trigger condition	Advanc	ed Countral 1	Total san
AND DM2 <= DINT#1500		Auvanc	Sampled when	
AND DM2 <= DINT#1500	M50 Rising Edge AND M40 Falling Edge (OR CO>=INT#	100 💿 <u>S</u> can end	
	AND DM2 <= DINT#1500		O Period of:	ms 🗸
	L			

(3) Trace condition setting

Set the sample timing, total number of samples, and trigger points as trace conditions.

Same of data Date and time Name of data Date and time V DM2 V DM2 V M40 BODL V V3.0 BODL V M50 V V V V V V V V V V V V V V V V V V <t< th=""><th colspan="11">🖾 Sampling Trace</th></t<>	🖾 Sampling Trace										
Name of data Date and time Sample target Data type DM2 DINT M40 BOOL Y3.0 BOOL Y0.0 Y0.0 Y0.0 Y0.0 Y0.0 Y0.0 Y0.0 Y0.0 Y0.0 Y0.0 Y0.0 Y0.0											
M40 BOOL Y3.0 BOOL Y6.0 INT Y6.0 BOOL Y7.0 Y7.0 Y7.0	ŦĦ										
M40 BOOL Y3.0 Y3.0 Y3.0 Y3.0 Y3.0 Y3.0 Y3.0 Y3.0 Y3.0 Y3.0 Y3.0											
Y3.0 BOOL YCO INT M50 BOOL YCO INT YCO INT YCO BOOL YCO INT YCO BOOL YCO YCO Y	+										
C0 INT M50 B00L M50 B00L M50 B00L M50 M50 M50 <td< th=""><th></th></td<>											
M50 BOOL											
	+										
	*										
	+										
Total sample count 0 <= 50 Address ×	+										
Sampling settings Graph view settings											
Trigger condition Advanced Sampled when Total sample number: 500 <= 3276											
Scan end O Irigger point: I Comm. settings Manual trig	TE										
Mou rising Log M Period of: ms 247											

<Sampled when: the sample timing>

- [Scan end]: Sampling is performed when every scanning (default task) is done.
- [Period of]: Sampling is performed in the set cycle. The setting range is 1 to 32000ms (0.5ms * N), and you can specify the value that is an integral multiple of SX bus takt.

<Total sample number: total number of samples>

Set the total number of samples. A value equal to or greater than 3 in the range displayed on the right can be set. The value displayed on the right changes depending on the number of sampling devices.

<Trigger point>

Move the slide bar horizontally to set a trigger point. The value displayed on the screen is the sampling data number to download before operating trigger. When using a manual trigger, this setting is disabled. (The trigger point is fixed to 0.)

(4) Sampling trace execution

<Manual trigger>

◆ Click the [Connect the PLC] button, and then the [Manual trigger] button.

🖾 Sampling Tr	ace [48E_Data10.swfa]	soo nananana	n an			
i 🗗 💕 • 🗐 •	Y	(P)		Show <u>w</u> ith Tag	NP1PM-48E Online	
Name of data	Date and time		Sample target	Data type		
Sample-1	2009/08/12 16:25:29		✓ DM2	DINT		
			M40	BOOL		
			Y3.0	BOOL		
			🔽 C0	INT		
			M50	BOOL		
					_	
					—	
					• • • • • • • • • • • • • • • • • • • •	
	Total sample count 1 <	= 50	Address	>	<	
Sampling settings	Graph view settings				T + + + + F + + + + + + + + + + + + + + + + + + +	
Trigger condit	tion	Advance	Sampled when	Total sa	mple <u>n</u> umber: 3276 <= 3276	Connect the PLC
			Scan end		rigger point:	Comm. settings Manual trigger
			O <u>P</u> eriod of:	ms	0	<u>R</u> eset

◆ The message saying "Triggered !" appears, and sampling starts.

🖾 Sampling Trac	e [48E_Data10.swfa]					
i 🛅 💕 • 🗐 • [] 👘		Show with Tag	NP1PM-48E	Triggered !)
Name of data	Date and time	Sample target	Data type			
Name of data	Date and time 2009/08/12 16:25:29	Sample target V DM2 V M40 Y3.0 V C0 V M50 V M50	Data type DINT BOOL BOOL INT BOOL			
Concline on Min	Total sample count T <= 50	Address				
Sampling settings	iraph view settings					
I rigger condition	Adv	anced Sample	d when Total	sample <u>n</u> umber: 3276 <= 3	3276 Conne	ect the PLC
	V	O Sca	in end	Engger point.	Comr	m. settings Manual trigger
				0		<u>R</u> eset

▲	When the compline i	ie dona tha	massaga chang	nnihea'''' of sa	Reading of	eamnlina data ie etart	Δd
•	which the sampling i		message change	co to ricauling	. Itcauling of	Sampling uala is slart	cu.

Sampling Tr	aco [48E_Data10_curfa]							
	E	1		Show with Tag	NP1PM-48E	Reading	(******	
Name of data	Data and time		Causta tauast	Data was				
	Date and time		Sample target	Data type				
Sample-I	2009/08/12 16:25:29		M DM2	DINI				
			M4U	BUUL	-	* *		••
			Y3.U	BUUL				
				INT				
			M50	BUUL	_	*		•
					—			
					-			• •
					_			
								•
			(
								•
						****		• • • • •
						****		• •
								• • • • • • •
	Total sample count 1 <=	50	Address	;	×			
Sampling settings	Graph view settings							
Trigger condit	ion	Ad <u>v</u> anc	ed Sampled when	Total sa	ample <u>n</u> umber: 3276	<= 3276	Connect the PLC	<u>E</u> xecute
~			O Scan end O Period of		rigger point:		Comm. settings	anual trigger
					0			<u>R</u> eset

• When the reading of sampling data is done, the message changes to "Online." Sampling data is shown as a graph.

🖾 Sampling Tra	ce [48E_Data10.swfa]				$\mathbf{\times}$					
! 🛅 💕 • 🖬 • [Y		🔲 Sł	now <u>w</u> ith Tag	NP1PM-48E Online						
Name of data	Date and time		Sample target	Data type		Ŧ					
🔲 Sample-1	2009/08/12 16:25:29		DM2	DINT							
Sample-2	2009/08/12 16:26:22		M40	BOOL							
			Y3.0	BOOL							
			CO CO	INT							
			M50	BOOL							
	Total sample count 2 <	= 50	Address								
Sampling settings	Sampling settings Graph view settings										
Trigger conditio	n	Advanc	ed Sampled when	Totals	sample number: 3276 <= 3276						
_			Sampled wrigh	0		-					
~				_ n	Comm. settings Manual trigger						
					0 Beset						

<Condition trigger>

♦ Click the [Connect the PLC] button, and then the [Execute] button.

🖂 Sampling Trace [48E_Data10.swfa]											
! 🛅 💕 - 🗐 - 🚺	-	7	🗌 Sho	ow <u>w</u> ith Tag	NP1PM-48E	Online					
Name of data	Date and time 2009/08/12 16:25:29 2009/08/12 16:26:22 2009/08/12 16:26:22		Sample target DM2 M40 Y3.0 CO M50 Sample target M50 Sample target M50 Sample target Sample target S	Data type Data type DINT BOOL BOOL INT BOOL INT BOOL							
	Total sample count 2 <= 5	0	Address		× • •						
Sampling settings	iraph view settings										
M50	✓ Trigger condition Advanced Sampled when Total sample number: 3276 <= 3276 € Connect the PLC Execute M50 ♥ Bising Edg ♥ ●										
L					1650		l	<u>R</u> eset			

◆ The message saying "Waiting to be triggered" appears.

🖾 Sampling Trac	ce [48E_Data10.swfa]							
i 🛅 💕 • 🗐 • [3		📃 Sho	w <u>w</u> ith Tag	NP1PM-48E	Waiting to be triggere	ed	
Name of data	Date and time		Sample target	Data type				
🔲 Sample-1	2009/08/12 16:25:29		DM2	DINT				
Sample-2	2009/08/12 16:26:22		🗹 M40	BOOL		++		
			Y3.0	BOOL				
			C0	INT				
			M50	BOOL				
							1 / /	
					· · · · ·		V . V .	
						++		
					• • • • • • • • • • • • • • • • • • •	+	+ + + + + + + + + + + + + + + + + + + +	
	Total sample count 2 <=	- 50	Address			++	+ + + + + + + + + + + + + + + + + + + +	
Compling optimes								
Sampling secongs	araph view settings							
🗹 Trigger conditio	n 🗌	Advance	d Sampled when	Total san	ple <u>n</u> umber: 327	6 <= 3276	Connect the PLC	Execute
	_		Scan end	0 Iri	gger point:			Manual trigger
M50 🔽	Rising Edg 🐱		O Period of:	ms			Comm. settings	manual nyyer
L					1650]		<u>R</u> eset

♦ When the trigger condition is approved, the message saying "Triggered !" appears. Sampling is started.

🖾 Sampling Trac	🖂 Sampling Trace [48E_Data10.swfa]											
! 🗊 💕 - 🖬 - 🖪]	7	🔲 Sha	ow <u>w</u> ith Tag	NP1PM-48E	Triggered !						
Name of data	Date and time		Sample target	Data type								
🔲 Sample-1	2009/08/12 16:25:29		DM2	DINT								
Sample-2	2009/08/12 16:26:22		M40	BOOL								
			Y3.0	BOOL								
			🗹 C0	INT								
			M50	BOOL	• • •	•	*					
		_										
Compling collings	Total sample count 2 <= 50 Address X											
Sampling seconds	raph view settings											
✓ Trigger condition Advanced M50 ✓ Rising Edg ✓ ✓ Eeriod of: ms ✓ Total sample number: 3276 <= 3276 ✓ Igger point: I ✓ Eeriod of: ms ✓ 1650 Eeset												

♦ When the sampling is done, the message changes to "Reading." Reading of sampling data is started.

🖾 Sampling Tra	ce [48E_Data10.swfa]							
i 🗗 💕 • 🗐 • [9	1	Show	v <u>w</u> ith Tag	NP1PM-48E	Reading	(*********	
Name of data Sample-1 Sample-2	Date and time 2009/08/12 16:25:29 2009/08/12 16:26:22		Show Sample target ✓ DM2 ✓ M40 ✓ Y3.0 ✓ C0 ✓ M50	with Tag Data type DINT BOOL BOOL INT BOOL INT BOOL INT BOOL INT BOOL INT BOOL INT	NP1PM-48E	Reading		
	Total sample count 2 <= 50		Address		×	• •	· · ·	
Sampling settings (Graph view settings							
Trigger conditio	n Ad	vanced	Sampled when Scan end Period of:	ms	imple <u>n</u> umber: 3276 rigger point: I 1650	<= 3276	Connect the PLC	<u>Execute</u> Aanual trigger <u>R</u> eset

♦ When the reading of sampling data is done, the message changes to "Online," and the sampling data is shown as a graph.

🖾 Sampling Trac	e [48E_Data10.swfa]								
i 🗊 💕 • 📓 • 📔			🗖 Sł	iow <u>w</u> ith Tag	NP1PM-48E Online				
Name of data Sample-1 Sample-2 Sample-3	Date and time 2009/08/12 16:25:29 2009/08/12 16:26:22 2009/08/12 16:30:14		 SH Sample target ✓ DM2 ✓ M40 Y3.0 ✓ C0 ✓ M50 	ow with Tag Data type DINT BOOL BOOL INT BOOL INT BOOL INT BOOL INT BOOL INT BOOL INT	NP1PM-48E Online				
Sampling settings	Total sample count 3 <:	= 50	Address		×	• • • • •			
Y Trigger condition Advanced Sampled when Sampled when Socan end Scan end Period of: ms Total sample number: 3276 <= 3276 Connect the PLC Execute M50 Period of: ms Encoder Escon Escon Beset Escon									

(5) Displaying the result of a sampling trace

The screen displaying the result of a sampling trace is as follows.

icons					
,	Sampling data list				
vfa]					
X	🗖 S	how <u>w</u> ith Tag	NP1PM-48E	Online	
9 2 4 3 <= 50	Sample target DM2 M40 Y3.0 CO M50 Address	Data type DINT BOOL BOOL INT BOOL BOOL			
Advanc	Sampled when Sampled when Sampled when Scan end Period of:	ms Total s	ample <u>n</u> umber: 3276 <= 32 Irigger point: I	76 Connect the PLC	Execute Manual trigger <u>R</u> eset
	Vfa] 9 2 4 3 <= 50 Advance	Sampling data list	Sampling data list Vfa Sample target Data type DM2 DM2 DINT M40 BOOL Y3.0 BOOL Y5.0	Sampling data list	Sampling data list

<Saving data Icons>



- [New]: This button is used to clear a sampling trace setting and a data list of sampling.
- [Open]: This button is used to open a file saved by "Save" or "Create setting file." (Either file is Extension. swfa)
- [Save]: This button is used to save the data of sampling data list, and the setting of sampling trace. (Extension. swfa)
- [Create setting file]: This button is used to save the setting of sampling trace.

<Sampling data list>

Every time when sampling trace is completed, temporary data is created. This data can be created up to 50. When exceeding 50, sampling trace cannot be done. To avoid that, delete it by using the key as needed.

<Save sampling data as csv>

Sampling data can be saved as csv. Check data to save as csv in the sampling data list, right-click it, and then select "Export as CSV file" from the menu.

🖾 Sampling Trace [48E_Data10.swfa]								
i 🛅 🚅 + 🛃 + 🖹								
Name of data Date and time								
🗹 Sample-1		2009/	/08/12 16:25:29					
🗹 Sample-2		2009/08/12 16:26:22						
Same - 2		2000 200 212 1 C-20-1 A						
	Rena	me	F2					
	<u>D</u> elet	e	Del					
	Delet	e aļļ	-					
Export as CSV file								

<Graph view settings>

Click the [Graph view settings] tab. The "graph view settings" screen is displayed. Click the device to change settings. To show or hide the graph, check or uncheck the box of the device.

🖾 Sampling Trac	ce [48E_Data10.swfa]				
i 🖥 💕 • 🖬 • 🛙	3 💣		Show <u>w</u> ith Tag	NP1PM-48E Onli	ne
Name of data	Date and time	1 🗹 DM2	0.000		
Sample-1	2009/08/12 16:25:29	2 🔽 M40	0.000		
Sample-2	2009/08/12 16:26:22	2 2 20	0.000		
Image: State S	2003/00/12 10:30:14	3 🕑 13.0	0.000		
		4 🗹 LU	0.000		
		5 🗹 M50	0.000		
		6			
		7			
		8			
		9			
		10			
		11			
		12			
		12			
		13			
		14			
		15			
		16			
		17			
		18			
		19			
	Total sample count 3 <= 50		<u> </u>		
Sampling settings	araph view settings				
<u> </u>		V10		<u>Horizontal</u>	or
M50	▼ ▼ 0.5	5 👌 /div 🔔 📑		100 🍨 /div 🖪	Measure
				—— "∠ero level check	" ICON

• [Vertical]: You can adjust the fineness of scale on the vertical axis and specify the color of the graph.

• [Horizontal]: You can adjust the fineness of the scale on the horizontal axis.

• [Cursor]: Move the vertical cursor on the graph and click the [Measure] button. The value of the coordinate is displayed.

2-5-10 Online - Program Operation

This command is used to select and perform one or more programs assigned in one resource (CPU module). Debugging work can be done for each program using this function.

- Note: The program operation function cannot be used during execution of other test functions (break point, step execution, condition monitor). However, other test functions can be used after execution of the program operation function. Before using this function, execute [Online] menu > [Monitor] to place the program window into a monitoring state.
- Click [Online] menu > [Program operation]. The [Program Operation] dialog box opens. The programs whose box is checked are valid. Uncheck the box of the program to be invalid, and click the [OK] button.

Program Operation			
Program Information: Program Name Uadder0 PG00001 Ladder1 Ladder2	Task Name Default Default Default Default	Task Type Default Default Default Default	OK Cancel <u>S</u> elect All <u>D</u> eselect All
ON the check box to enable	the program.		

Note: The invalid program is canceled when the power of the CPU module is reset (OFF to ON). All programs become valid, and all programs assigned to the resource start to work.

2-5-11 Online - Task execution time measurement

This command is used to display the execution time of all working tasks, and the current/minimum/maximum value of the execution cycle. (Unit: μ s)

Task Exec	Task Execution Time Measurement 🛛 🕹 🕹									
👸 (micro s										
ES0/ES1	TaskName	TaskType	Current Time	Min Time	Max Time	Current Cycle	Min Cycle	Max Cycle		
-	Default	Default	27	26	93	1000	975	1026		

Current time / Min time / Max time: These are the execution times of the program.

Current cycle / Min cycle / Max cycle: These are the cycles where the program is performed. The program is executed in synchronization with the bus tact; It is same as scan time.

The target of Min time, Max time, Min cycle, and Max cycle is a period from the execution of "task execution time measurement" to the present.

2-5-12 Online - Data monitor

This command is used to monitor PLC devices.

◆ Click [Online] menu > [Data monitor] > [Data monitor 1]. The data monitor screen opens.

* Up to four data monitor screens can be opened: Data Monitor 1 to 4

Data Monitor 1						• ×
💘 🦊 🏠 🐺 🏠		<none></none>	- 🖬 🖣	e 📑 🕌		
Tag	F	0 F	o	DEC	HEX DATA	^
	Data Monitor 1	Data Monitor 1	Data Monitor 1 Image: Constraint of the second s	Data Monitor 1	Data Monitor 1 Data Monitor 1 Image: Control of the state of the s	Data Monitor 1 Image: Construction of the second

Place the cursor on the address row, enter [X1.0], and then press the <Enter> key. The status of X1.0 is displayed. (A value of 0 indicates ON; a value of 1 indicates OFF.)

Ladder0	Data Monitor 1						• ×
i 🦛 🚛 🗙	🗱 🕸 🏦 🦊	16 🖬 🚺	<none></none>	- 🖬 🖣	n 📴 🎬		
Address	Tag	F	0 F	0	DEC	HEX DATA	^
X1.0	_			0		0	

• Enter an addresses to monitor by following the above procedure.



- * The following addresses can be monitored. Check the status of timers and counters on the program screen.
- Bit address: X, Y, M, L, SM, S, ENO
- Word address: WX, WY, WM, WL, WSM, WS
- Double word address: DX, DY, DM, DL, DSM

Icons on the data monitor screen

- [Display next address]: Displays an address added +1 to the address below the cursor.
- [I] [Display data fill]: Displays continuous addresses starting from the address below the cursor.
- [Clear data]: Deletes an address below the cursor.
- [Clear all data]: Deletes all displayed addresses.
- [Bit ON]: Executes Overwrite ON for bit.
- [Bit OFF]: Executes Overwrite OFF for bit.
- Force ON]: Executes Force ON for bit. The target is the area of X, Y.
- [Force OFF]: Executes Force OFF for bit. The target is the area of X, Y.
- [Force reset]: Resets Force ON/OFF.
- [] [Force setting detail]: Displays the status of Force ON/OFF as a list.
- [Save data display setting]: Saves data display setting specified by the user.

2-6 Conversion menu

The "Conversion" menu contains the following commands:

- Conversion \Rightarrow Converts only the changed part of a program. The conversion time is short compared with that "Conversion All" command. Use this command to make the conversion time shorter when you make a small program change to a program.
- Conversion All ⇒ Converts the whole program. Usually use this command.
- * Do not use the "Conversion" and "Conversion All" commands when you change a program online. If you execute either, a machine code (code for PLC operation) is created.

2-6-1 Conversion menu - Conversion / Conversion All

These commands are used to convert programs.

The syntax of a program and the consistency of I/O and addresses set in the system definition are checked, and then program data to load to the PLC (machine code) is created. Make sure to execute "Conversion" or "Conversion All" before loading a program to the PLC.

Click [Conversion] menu > [Conversion] or [Conversion All]. The program is converted. Whether the conversion is completed normally is indicated in the status bar on the bottom of the screen.

<When conversion is normally completed>

When the status bar shows "Error : 0," the conversion is normally completed. If warning is not 0, see the contents of the warning and check whether the system has any problem.



When the conversion is normally completed, information on the program such as program steps, the number of timers/counters used can be checked on the "Information" window. (If the conversion is failed, this window does not appear.)

Informatio	Information 4 X										
	Program Name	Program Type	Step	User FB	Edge	Counter	Timer	Add up timer	Other FB	Instance nests	
Resource											
	Ladder0	Program	39 step	0	0	0	1	0	0	-	
	Ladder1	Program	41 step	0	0	0	1	0	0	-	
Total											
		Program : 2	80 step	0	0	0	2	0	0	0	
		Function block : 0									
		Function : 0									

<When conversion is abnormally completed>

If the program has some errors, the "Error" window appears as shown below. The program cannot be converted and needs to be corrected. Double-click the row of the explanation part, and the corresponding line is displayed.

Error				ч.
Туре	Explanation	Program Name	Circuit No./Line No.	Device No.
8	'X3.0' is address out of range.Please confirm the IO constitution of the system definition.	Ladder0	1	1
2	'Y2.12' is address out of range.Please confirm the IO constitution of the system definition.	Ladder0	3	6
👩 Erroi	🕝 📝 Information			
Error : 2	, Warning : 0	0.1K		
2-6-2 Conversion menu - ST Syntax Check

This command is used to check the syntax of a program created in ST language. An active program is checked.



2-6-3 Conversion menu - Program Check

This command is used to check the syntax of the whole program. No machine code is created. Use this command to check the syntax of a program before changing it online. ST syntax is also checked.

2-7 Tools menu

The "Tools" menu contains the following commands:

- Address Assignment ⇒ Creates the address conversion rule to convert a program for MICREX-F or FLEX-PC to SX.
- SX Control Utility ⇒ Starts SX Control Utility software.
- Shortcut key \Rightarrow Changes the assignment of shortcut keys.
- Customize Instruction Jog
 Changes the Instruction Jog.

2-7-1 Tools menu – User ROM Utility

This command is used to initialize a user ROM (CF card), or read and write a program. Connect a user ROM to the computer using a commercial card reader and writer.

◆ Click [Tool] menu > [User ROM utility]. The following dialog box opens.

User ROM Utility	
Load to User ROM Load from User ROM Verify with Source(Loader) Program System Definition Zip file Program Name Iag Line Comment System Configuration Tag project	User ROM Maintenance Security Destination(User ROM) Drive: K:
	Logd to User ROM Close

Operation items of a user ROM are as follows:

- Load to User ROM: Transfers a program from the loader to a user ROM.
- · Load from User ROM: Transfers a program from a user ROM to the loader
- Verify with User ROM: Compares the currently open program with a program in a user ROM.
- Maintenance: Initializes a user ROM.
- Security: Sets a password on a user ROM

(1) Download to User ROM

This function transfers a program from the loader to a user ROM.

Check items to download (usually check all items.), select a drive to download (a drive to which the user ROM is assigned), and then click the [Load to User ROM] button.

User ROM Utility			
Load to User ROM Load from User ROM Verify with Source(Loader) Program System Definition Zip file Program Name Iag Line Comment System Configuration Tag project	User ROM Maintenance Security Destination(User ROM)		
Logd to User ROM Close			

◆ The confirmation dialog box appears. Click the [OK] button.



◆ The dialog box showing download completion appears. Click the [OK] button.



*Only one program can be saved in a user ROM.

(2) Load from User ROM

This function transfers a program saved in the user ROM to the loader.

Select the transfer source drive (the drive to which the use ROM is assigned), and then click the [Load from User ROM] button.

User ROM Utility	×
Load to User ROM Load from User ROM Verify with User ROM Maintenance Security User ROM Drive: K: C Load in Zip File	
Load from User ROM Close	5

◆ The confirmation dialog box appears. Click the [OK] button.

SX-Programmer Standard 🛛 🔀		
?	Do you wish to load the project from user ROM?	
	OK Cancel	

◆ The dialog box showing loading completion appears. Click the [OK] button.



(3) Verify with User ROM

This function compares a loader program with a program of a user ROM.

Check items (usually check all items.) to verify, select the drive of the use ROM (the driver to which the user ROM is assigned), and then click the [Verify with User ROM] button.

Jser ROM Utility Load to User ROM Load from User ROM Verify w Loader ✓ Program ✓ System Definition	with User RC	M Maintenance Security Jser ROM Drive: K:
		Verify with User ROM Close

◆ The confirmation dialog box appears. Click the [OK] button.



◆ The verification result is displayed.

Ve	rification				Į X
80	1 🖻 🔮		• 🍸 💈		
	State	Data Type	Current Project	Project User ROM	
9	Common	System Definition	System Structure Definition	System Structure Definition	
0	Common	System Definition	System Running Definition	System Running Definition	
0	Common	System Definition	System Digital Output Setting	System Digital Output Setting	
0	Common	System Definition	CPU Running Definition	CPU Running Definition	
0	Common	System Definition	CPU Memory Border Definition	CPU Memory Border Definition	
0	Common	System Definition	SRM Band Ratio Definition	SRM Band Ratio Definition	
0	Common	System Definition	CPU Running Definition 2	CPU Running Definition 2	
0	Common	System Definition	I/O Group Definition 1	I/O Group Definition 1	
0	Common	System Definition	I/O Group Definition 2	I/O Group Definition 2	
0	Common	System Definition	I/O Group Definition 3	I/O Group Definition 3	
0	Common	System Definition	Direct I/O Fail-Soft Operation Setting	Direct I/O Fail-Soft Operation Setting	
0	Common	System Definition	Remote I/O Master 0 Fail-Soft Operation Setting	Remote I/O Master 0 Fail-Soft Operation Setting	
0	Common	System Definition	Ethernet Definition	Ethernet Definition	
0	Common	System Definition	Direct I/O HOLD Definition	Direct I/O HOLD Definition	
0	Common	System Definition	Direct I/O Running Mode	Direct I/O Running Mode	
0	Common	System Definition	Remort I/O Master 0 Running Definition	Remort I/O Master 0 Running Definition	
0	Common	Project	Project1	User ROM	More >>
•	Modified	Task	DEFAULT : Default	Default : Default	More >>
•	Modified	Program: (0)	PG00000	Ladder0	More >>
•	Modified	Circuit	PG00000 - 2	Ladder0 - 2	More >>
•	Modified	FB Instance	Address Allocation	Address Allocation	

The verification result is classified by color. White : Common Orange : Modified Gray : Not exist Explanation of Icons



Icon	Explanation	
System Definition	Used to show/hide "System definition" in the "Data Type" column.	
Programs	Used to show/hide "Circuit" in the "Data Type" column.	
Common	Used to show/hide "Common" in the "State" column.	
Modify	Used to show/hide "Modified" in the "State" column.	
Filter line strings	Used to enter a filter keyword.	
Filter	Enter a filter keyword, and then click this button to filter the list. Only the items that includes the entered keyword are shown. Click this button again to cancel the filter.	
Update the latest status	Used to verify one more time	

* To check mismatched lines, follow the same procedure as in project verification. Refer to "2-4-5 Project Menu - Verify" for more details.

(4) Maintenance

This function formats a user ROM, clears projects in the user ROM and sets a password. Select the drive of the user ROM and click the operation item button.

User ROM Utility
Load to User ROM Load from User ROM Verify with User ROM Maintenance Security User ROM
Close

(4)-1 Format

This function formats the user ROM. When you execute formatting, the contents in the user ROM are deleted all, and the CPU creates a folder and file to recognize programs.

- * When using SPH300 software version earlier than V59, the OS of the computer used for formatting must be Windows 2000. A user ROM formatted by Windows XP or Vista computer cannot be recognized.
- Select the drive of the user ROM (the drive to which the user ROM is assigned), and then click the [Format] button. The warning dialog box appears. Confirm the contents and click the [OK] button to proceed to the next screen.



• The "Format" dialog box appears. Confirm the contents and click the [Start] button to proceed to the next screen.

Format	?×
Cagacity:	
30.9 MB	*
<u>F</u> ile system	
FAT	*
Allocation unit size	
Default allocation size	~
Volume <u>l</u> abel	
- Format options	
Quick Format	
Enable Compression	
Create an <u>M</u> S-DOS startup disk	
<u></u>	lose

When using SPH 300, select "FAT" for File system.

◆ The warning message appears. Confirm the contents and click the [OK] button to start formatting.

Format	
1	WARNING: Formatting will erase ALL data on this disk. To format the disk, click OK. To quit, click CANCEL.
	OK Cancel

♦ When the formatting is completed, the following dialog box appears.



(4)-2 Clear

This function clears a program saved in a user ROM.

♦ Select the items to clear, and click the [Clear] button.

Clear 🔀	
Clear target(User ROM)	
Program	
System definition	
Zip File)	
<u></u> Close	

♦ When the program is cleared, the following dialog box appears.



(4)-3 Password

This function sets a password on a user ROM. If a password is set, the password is required to access to the user ROM. (The password is not required to format the user ROM. If the user ROM is formatted, both the program and password are cleared.)

<New registration of password>

Click the [Registration] button on the following dialog box.

Password	X
Please input password:	Registration
	hange
* Input password with 6 - 32 characters.	R <u>e</u> lase
ОК	Cancel

◆ The password entry dialog box appears. Enter a password, and then click the [OK] button.

egistration	
Input registration password:	

Check and input registration password:	

- * The password must be between 6 and 32 alphanumeric characters and symbols (+, -, =, /).
- The password is set.



<Entering the password>

To access (read/write/verify/clear/set as Read only) the user ROM where a password is set, you need to enter the password in the following dialog box.

• Enter the password in the following dialog box, and then click the "[OK] button.

Password	
Please input password:	Registration
*****	Change
* Input password with 6 - 32 characters.	R <u>e</u> lase
ОК	Cancel

* If you enter a wrong password and try to access to the user ROM, the following message appears.

SX-Prog	rammer Standard 🛛 🛛 🔀	
1	The password is not corresponding. Please input password by 'Maintenance'.	
	ОК	

<Changing the password>

This function changes the password registered for the user ROM to new one.

• Enter the registered password and a new password, and then click the [OK] button.

Change	
Input password registerd already:	

Input new password:	

Check and input new password:	

* Input password with 6 - 32 characters.	
ОК	Cancel

◆ The password is changed.



<Canceling the password>

This function cancels the password registered for the user ROM.

Click the [Cancel] button on the following dialog box.

Password	\mathbf{X}
Please input password:	Registration
	Change
* Input password with 6 - 32 characters.	R <u>e</u> lase
ок	Cancel

The password entry dialog box appears. Enter the password, and click [OK].

Release	
Input password registerd already:	_

* Input password with 6 - 32 characters.	
OK	Cancel

◆ The password is canceled.



(5) Security

This function sets read only for the user ROM.

Select the drive of the user ROM (the drive to which the user ROM is assigned), and check "Read only." The dialog box to set a password appears. Enter a password, and then click the [OK] button.

ser ROM U	tility					
Load to Use	r ROM	Load from User ROM	Verify with User ROM	Maintenance	Security	
User ROM	1					
<u>D</u> rive:	К:	~				
	ad only					
	Allow t	o write by F_WRITE.				
						Close

* The password must be between 6 and 32 alphanumeric characters and symbols (+, -, =, /).

ReadOnly	
Please set the password to turn on the read only attribute. Read Only Password: ***** Password Confirmation: ***** * Input password with 6 - 32 characters. Allow to write by F_WRITE OK Ca	ancel
SX-Programmer Standard	Even when "Read only" is set, data writing by application program (F_WRITE) is permitted by checking this box.

To permit writing to the user ROM, uncheck "Read only," and cancel the password.

oad to User ROM	oad from User ROM.	Verify with Us	er ROM Maii	ntenance Se	curity	
-User ROM						
Duve: K:	•					
Read only]					
Allow to	write by F_WRITE.					
1						

 $\overline{\Box}$

ReadOnly	×
Please set the password to turn off the read only a	ttribute.
Read Only Password:	

* Input password with 6 - 32 characters.	
ок	Cancel
$\overline{\nabla}$	
SX-Programmer Standard 🛛 🛛 🔀	
The read only attribute was turned off.	
ОК	

2-7-2 Tools menu - Address Assignment

This command is used to define the address assignment rule to convert MICREX-F or FLEX-PC programs. For more details, refer to the user's manual "Replacement Manual MICREX-F to MICREX-SX <Convert> (FEH038)."

2-7-3 Tools menu - SX Control Utility

This command is used to start the SX Control Utility software. For more details, refer to Appendix 1.

2-7-4 Tool Menu- Shortcut key

You can customize shortcut keys that are assigned to each menu of the loader. For the shortcut keys, the combinations as shown below can be used.

(None)	F11
Shift	Ins, Del
Ctrl	A to Z, F1 to F3, F5, F7 to F12, Ins, Del, -
Alt	A to Z, F1 to F3, F5, F7 to F12, Ins, Del, -
Ctrl + Alt	A to Z, F1 to F12
Ctrl + Shift	A to Z, F1 to F12

* When the shortcut key you select has been already assigned to a function, and if you assign the key to another function, the originally assigned function has no shortcut key function.

<Setting a shortcut key>

Set a shortcut key following the procedure below.

◆ Select a command to register from the "Command" list.

Edit		\odot	
Command	Shortcut Key		Control Key:
Undo	Ctrl+Z		Ctrl
Redo	Ctrl+Y		Shortout Keur
Cut	Ctrl+X		Shoreda Key.
Сору	Ctrl+C		[None]
Paste	Ctrl+V		Utrl+A CHL D
Find	Ctrl+F		Cm+B
Find Output Device	Ctrl+Alt+F		CH+C
Find Next			Ctrl+E
Find Instructions			Ctrl+E
Replace			Ctrl+G
Go to Line	Ctrl+G		Ctrl+H
Insert Row	Shift+Ins		
Delete Row	Shift+Del	~	
Default			

Select a "control key" to use, select a shortcut key from the list, and then click the [Apply] button.

Shortcut Key		
<u>C</u> ommand:		
Edit		~
Command	Shortcut Key	Control Key:
Undo	Ctrl+Z	🚺 (Ctrl+Shift 🛛 🗸)
Redo	Ctrl+Y	Shortout Keur
Cut	Ctrl+X	Shoncut Key.
Сору	Ctrl+C	(None)
Paste	Ctrl+V	Ltrl+Shift+A
Find	Ctrl+F	Child Children C
Find Output Device	Ctrl+Alt+F	Ctrl+Shift+D
Find Next		CtrlaShiftaE
Find Instructions		Ctrl+Shift+E
Replace		Ctrl+Shift+G
Go to Line	Ctrl+G	Ctrl+Shift+H
Insert Row	Shift+Ins	
Delete Row	Shift+Del	
<u>D</u> efault	~	
Save to File	Load from File	OK Cancel

A shortcut key is set.

Edit		*		
Command	Shortcut Kev	~	Control Key:	
Undo	Ctrl+Z		Ctrl+Shift	~
Redo	Ctrl+Y		Shortcut <u>K</u> ey:	
Conv	Ctrl+C		(None)	~
Paste	Ctrl+V		Ctrl+Shift+A	
Find	Ctrl+F		Ctrl+Shift+B	
Find Output Device	Ctrl+Alt+F		Ctrl+Shift+C	
Find Nevt	Ctrl+Shift+E		Ctrl+Shift+D	
Find Instructions	Cartonact		Ctrl+Shift+E	
Benlace			Chirchint+F	
Gataline	Ctd+G		CHUSHING	~
Insert Bow	Shift+Ins		Cul+Shilt+H	
Delete Row	Shift+Del	~		
	0.11		ų	
	0.11		(

<Deleting a shortcut key> To delete a shortcut key, select a command, and then click the key.

Edit		~	
Command	Shortcut Key		Control Key:
Undo	Ctrl+Z		(None)
Redo	Ctrl+Y		Charley & Kaw
Cut	Ctrl+X		Shortcut Ney.
Сору	Ctrl+C		(None)
Paste	Ctrl+V		F11
Find	Ctrl+F		
Find Output Device	Ctrl+Alt+F		
Find Next	Ctrl+Shift+F		
Find Instructions			
Replace			
Go to Line	Ctrl+G		
Insert Row	Shift+Ins		
Delete Row	Shift+Del	~	Apply
	0.11		
<u>D</u> efault			

 \square

t Key Control Key: (None) Shortcut Key: [None] [None]
(None) Shortcut <u>Key:</u> (None)
Shortcut <u>Key:</u> (None)
(None)
(None)
611
F
l 🗸 Apply

<Saving/reading a shortcut key> This function is used to save the shortcut key setting as a file or read the saved setting.

o .		Control Keur
Command	Shortcut Key	
New project	Ctrl+N	(None)
Based on an existing project		Shortcut Kev:
Open	Ctrl+O	(Marra)
Close		[None]
Save	Ctrl+S	FII
Save As		
Page Setup		
Print	Ctrl+P	
Print Preview		
Exit		
		Apply

* Shortcut key settings saved by Standard loader V2 cannot be used in Standard loader V3.

The table below shows the	predetermined shortcut keys.
---------------------------	------------------------------

New Project Ctrl + N Open Ctrl + O Save Ctrl + S Print Ctrl + P Undo Ctrl + Z Redo Ctrl + Y Cut Ctrl + X Copy Ctrl + C Paste Ctrl + V Find Ctrl + F FindOutput Device Ctrl + Alt + F Insert Row Shift + Ins Delete Row Shift + Del Insert Column Ctrl + F1 Find Result Ctrl + F2 Cross Reference Window Ctrl + F2 Output View Ctrl + F1 Find Result Ctrl + F2 Cross Reference Window Ctrl + F3 Output Window Ctrl + F3 Output Window Ctrl + F4 Trace Back Cress Reference Ctrl + R Trace Back Cress Reference Ctrl + F10 Monitor Ctrl + F10 Monitor Ctrl + F10 Monitor Ctrl + F10 Monitor Ctrl + F10 Monitor <th>Function</th> <th>Shortcut Key</th>	Function	Shortcut Key
Open Ctrl + O Save Ctrl + S Print Ctrl + P Undo Ctrl + Z Redo Ctrl + Y Cut Ctrl + X Copy Ctrl + C Paste Ctrl + V Find Ctrl + F FindOutput Device Ctrl + Alt + F Insert Row Shift + Ins Delete Row Shift + Del Insert Column Ctrl + F1 Find Result Ctrl + F2 Cross Reference Window Ctrl + F3 Output Window Ctrl + F3 Output Window Ctrl + F6 Error Window Ctrl + F7 Information Window Ctrl + F7 Information Window Ctrl + F8 Make Cross Reference Ctrl + R Trace Back Cress Reference Ctrl + Shift + - PLC Operation Ctrl + F10 Monitor Ctrl + F10 Monitor Ctrl + F9 Sampling Trace Alt + R Breakpoints Window Ctrl + F9	New Project	Ctrl + N
SaveCtrl + SPrintCtrl + PUndoCtrl + ZRedoCtrl + YCutCtrl + XCopyCtrl + CPasteCtrl + VFindCtrl + FFind Output DeviceCtrl + Alt + FInsert RowShift + InsDelete RowShift + DelInsert ColumnCtrl + F1Find ResultCtrl + F2Cross Reference WindowCtrl + F3Output WindowCtrl + F5Error WindowCtrl + F7Information WindowCtrl + F8Make Cross ReferenceCtrl + RTrace Back Cress ReferenceCtrl + F10MonitorCtrl + F10MonitorCtrl + F10MonitorCtrl + F10MonitorCtrl + F10MonitorCtrl + F10Sampling TraceCtrl + F9Sampling TraceCtrl + F11Syntax CheckCtrl + F11	Open	Ctrl + O
PrintCtrl + PUndoCtrl + ZRedoCtrl + YCutCtrl + XCopyCtrl + CPasteCtrl + VFindCtrl + FFind Output DeviceCtrl + Alt + FInsert RowShift + InsDelete RowShift + DelInsert ColumnCtrl + F1Find ResultCtrl + F2Cross Reference WindowCtrl + F3Output WindowCtrl + F3Output WindowCtrl + F7Information WindowCtrl + F8Make Cross ReferenceCtrl + RTrace Back Cress ReferenceCtrl + F10MonitorCtrl + F10MonitorCtrl + F10MonitorCtrl + F10MonitorCtrl + F10MonitorCtrl + F10MonitorCtrl + F10Sampling TraceCtrl + F9Sampling TraceCtrl + F1Task Execution Time MeasurementCtrl + F11Syntax CheckCtrl + F11	Save	Ctrl + S
Undo Ctrl + Z Redo Ctrl + Y Cut Ctrl + X Copy Ctrl + C Paste Ctrl + V Find Ctrl + F Find Output Device Ctrl + Alt + F Insert Row Shift + Ins Delete Row Shift + Del Insert Column Ctrl + F1 Find Result Ctrl + F2 Cross Reference Window Ctrl + F2 Cross Reference Window Ctrl + F3 Output Window Ctrl + F3 Output Window Ctrl + F7 Information Window Ctrl + F8 Make Cross Reference Ctrl + R Trace Back Cress Reference Ctrl + - Trace Forward Cross Reference Ctrl + F10 Monitor Ctrl + F10 Monitor Ctrl + F10 Data Modify Alt + D Forcible Reset Alt + R Breakpoints Window Ctrl + F9 Sampling Trace Ctrl + T Task Execution Time Measurement Ctrl + F11	Print	Ctrl + P
RedoCtrl + YCutCtrl + XCopyCtrl + CPasteCtrl + VFindCtrl + FFind Output DeviceCtrl + Alt + FInsert RowShift + InsDelete RowShift + DelInsert ColumnCtrl + F1Project ViewCtrl + F1Find ResultCtrl + F2Cross Reference WindowCtrl + F3Output WindowCtrl + F3Output WindowCtrl + F7Information WindowCtrl + F8Make Cross ReferenceCtrl + RTrace Back Cress ReferenceCtrl + Shift + -PLC OperationCtrl + F10MonitorCtrl + F10Data ModifyAlt + DForcible On/OffAlt + SForcible ResetAlt + RBreakpoints WindowCtrl + F9Sampling TraceCtrl + F1Task Execution Time MeasurementCtrl + F1Syntax CheckCtrl + F11	Undo	Ctrl + Z
CutCtrl + XCopyCtrl + CPasteCtrl + VFindCtrl + FFind Output DeviceCtrl + Alt + FInsert RowShift + InsDelete RowShift + DelInsert ColumnCtrl + InsDelete ColumnCtrl + DelProject ViewCtrl + F1Find ResultCtrl + F2Cross Reference WindowCtrl + F3Output WindowCtrl + F5Error WindowCtrl + F7Information WindowCtrl + F8Make Cross ReferenceCtrl + F1Trace Back Cress ReferenceCtrl + Shift + -PLC OperationCtrl + MData ModifyAlt + DForcible On/OffAlt + SForcible ResetAlt + RBreakpoints WindowCtrl + F9Sampling TraceCtrl + F1Ctrl + F9Sampling TraceCtrl + F1Syntax CheckCtrl + F11	Redo	Ctrl + Y
CopyCtrl + CPasteCtrl + VFindCtrl + FFind Output DeviceCtrl + Alt + FInsert RowShift + InsDelete RowShift + DelInsert ColumnCtrl + NsDelete ColumnCtrl + DelProject ViewCtrl + F1Find ResultCtrl + F2Cross Reference WindowCtrl + F3Output WindowCtrl + F5Error WindowCtrl + F7Information WindowCtrl + F8Make Cross ReferenceCtrl + F8Make Cross ReferenceCtrl + F10Trace Back Cress ReferenceCtrl + F10MonitorCtrl + F10MonitorCtrl + Shift + -PLC OperationCtrl + SForcible On/OffAlt + SForcible ResetAlt + RBreakpoints WindowCtrl + F9Sampling TraceCtrl + TTask Execution Time MeasurementCtrl + F11Syntax CheckCtrl + F11	Cut	Ctrl + X
PasteCtrl + VFindCtrl + FFind Output DeviceCtrl + Alt + FInsert RowShift + InsDelete RowShift + DelInsert ColumnCtrl + InsDelete ColumnCtrl + DelProject ViewCtrl + F1Find ResultCtrl + F2Cross Reference WindowCtrl + F3Output WindowCtrl + F5Error WindowCtrl + F7Information WindowCtrl + F8Make Cross ReferenceCtrl + RTrace Back Cress ReferenceCtrl + NPLC OperationCtrl + F10MonitorCtrl + F10Data ModifyAlt + DForcible ResetAlt + RBreakpoints WindowCtrl + F9Sampling TraceCtrl + F11Syntax CheckCtrl + F11	Сору	Ctrl + C
FindCtrl + FFind Output DeviceCtrl + Alt + FInsert RowShift + InsDelete RowShift + DelInsert ColumnCtrl + InsDelete ColumnCtrl + DelProject ViewCtrl + F1Find ResultCtrl + F2Cross Reference WindowCtrl + F3Output WindowCtrl + F5Error WindowCtrl + F7Information WindowCtrl + F8Make Cross ReferenceCtrl + RTrace Back Cress ReferenceCtrl + Shift + -PLC OperationCtrl + F10MonitorCtrl + F10Data ModifyAlt + DForcible On/OffAlt + SForcible ResetAlt + RBreakpoints WindowCtrl + F9Sampling TraceCtrl + F11Syntax CheckCtrl + F11	Paste	Ctrl + V
Find Output DeviceCtrl + Alt + FInsert RowShift + InsDelete RowShift + DelInsert ColumnCtrl + InsDelete ColumnCtrl + DelProject ViewCtrl + F1Find ResultCtrl + F2Cross Reference WindowCtrl + F3Output WindowCtrl + F5Error WindowCtrl + F8Make Cross ReferenceCtrl + F8Make Cross ReferenceCtrl + F1Trace Back Cress ReferenceCtrl + S1PLC OperationCtrl + F10MonitorCtrl + F10Data ModifyAlt + DForcible On/OffAlt + SForcible ResetAlt + RBreakpoints WindowCtrl + F9Sampling TraceCtrl + F1ConversionF11Syntax CheckCtrl + F11	Find	Ctrl + F
Insert RowShift + InsDelete RowShift + DelInsert ColumnCtrl + InsDelete ColumnCtrl + DelProject ViewCtrl + F1Find ResultCtrl + F2Cross Reference WindowCtrl + F3Output WindowCtrl + F5Error WindowCtrl + F7Information WindowCtrl + F8Make Cross ReferenceCtrl + F8Make Cross ReferenceCtrl + RTrace Back Cress ReferenceCtrl + Shift + -PLC OperationCtrl + F10MonitorCtrl + F10Data ModifyAlt + DForcible On/OffAlt + SForcible ResetAlt + RBreakpoints WindowCtrl + F9Sampling TraceCtrl + T1Task Execution Time MeasurementCtrl + F11	Find Output Device	Ctrl + Alt + F
Delete RowShift + DelInsert ColumnCtrl + InsDelete ColumnCtrl + DelProject ViewCtrl + F1Find ResultCtrl + F2Cross Reference WindowCtrl + F3Output WindowCtrl + F5Error WindowCtrl + F7Information WindowCtrl + F8Make Cross ReferenceCtrl + RTrace Back Cress ReferenceCtrl + NPLC OperationCtrl + F10MonitorCtrl + F10Data ModifyAlt + DForcible On/OffAlt + SForcible ResetAlt + RBreakpoints WindowCtrl + TTask Execution Time MeasurementCtrl + EConversionF11Syntax CheckCtrl + F11	Insert Row	Shift + Ins
Insert ColumnCtrl + InsDelete ColumnCtrl + DelProject ViewCtrl + F1Find ResultCtrl + F2Cross Reference WindowCtrl + F3Output WindowCtrl + F5Error WindowCtrl + F7Information WindowCtrl + F8Make Cross ReferenceCtrl + RTrace Back Cress ReferenceCtrl + -Trace Forward Cross ReferenceCtrl + Shift + -PLC OperationCtrl + F10MonitorCtrl + MData ModifyAlt + DForcible On/OffAlt + RBreakpoints WindowCtrl + F9Sampling TraceCtrl + TTask Execution Time MeasurementCtrl + EConversionF11Syntax CheckCtrl + F11	Delete Row	Shift + Del
Delete ColumnCtrl + DelProject ViewCtrl + F1Find ResultCtrl + F2Cross Reference WindowCtrl + F3Output WindowCtrl + F5Error WindowCtrl + F7Information WindowCtrl + F8Make Cross ReferenceCtrl + RTrace Back Cress ReferenceCtrl + -Trace Forward Cross ReferenceCtrl + Shift + -PLC OperationCtrl + F10MonitorCtrl + F10Data ModifyAlt + DForcible On/OffAlt + SForcible ResetAlt + RBreakpoints WindowCtrl + F9Sampling TraceCtrl + TTask Execution Time MeasurementCtrl + EConversionF11Syntax CheckCtrl + F11	Insert Column	Ctrl + Ins
Project ViewCtrl + F1Find ResultCtrl + F2Cross Reference WindowCtrl + F3Output WindowCtrl + F5Error WindowCtrl + F7Information WindowCtrl + F8Make Cross ReferenceCtrl + RTrace Back Cress ReferenceCtrl + -Trace Forward Cross ReferenceCtrl + Shift + -PLC OperationCtrl + F10MonitorCtrl + MData ModifyAlt + DForcible On/OffAlt + SForcible ResetAlt + RBreakpoints WindowCtrl + F9Sampling TraceCtrl + TTask Execution Time MeasurementCtrl + EConversionF11Syntax CheckCtrl + F11	Delete Column	Ctrl + Del
Find ResultCtrl + F2Cross Reference WindowCtrl + F3Output WindowCtrl + F5Error WindowCtrl + F7Information WindowCtrl + F8Make Cross ReferenceCtrl + RTrace Back Cress ReferenceCtrl + -Trace Forward Cross ReferenceCtrl + Shift + -PLC OperationCtrl + F10MonitorCtrl + MData ModifyAlt + DForcible On/OffAlt + SForcible ResetAlt + RBreakpoints WindowCtrl + F9Sampling TraceCtrl + TTask Execution Time MeasurementCtrl + EConversionF11Syntax CheckCtrl + F11	Project View	Ctrl + F1
Cross Reference WindowCtrl + F3Output WindowCtrl + F5Error WindowCtrl + F7Information WindowCtrl + F8Make Cross ReferenceCtrl + RTrace Back Cress ReferenceCtrl + -Trace Forward Cross ReferenceCtrl + Shift + -PLC OperationCtrl + F10MonitorCtrl + MData ModifyAlt + DForcible On/OffAlt + SForcible ResetAlt + RBreakpoints WindowCtrl + F9Sampling TraceCtrl + TTask Execution Time MeasurementCtrl + EConversionF11Syntax CheckCtrl + F11	Find Result	Ctrl + F2
Output WindowCtrl + F5Error WindowCtrl + F7Information WindowCtrl + F8Make Cross ReferenceCtrl + RTrace Back Cress ReferenceCtrl + -Trace Forward Cross ReferenceCtrl + Shift + -PLC OperationCtrl + F10MonitorCtrl + MData ModifyAlt + DForcible On/OffAlt + SForcible ResetAlt + RBreakpoints WindowCtrl + F9Sampling TraceCtrl + TTask Execution Time MeasurementCtrl + EConversionF11Syntax CheckCtrl + F11	Cross Reference Window	Ctrl + F3
Error WindowCtrl + F7Information WindowCtrl + F8Make Cross ReferenceCtrl + RTrace Back Cress ReferenceCtrl + -Trace Forward Cross ReferenceCtrl + Shift + -PLC OperationCtrl + F10MonitorCtrl + MData ModifyAlt + DForcible On/OffAlt + SForcible ResetAlt + RBreakpoints WindowCtrl + F9Sampling TraceCtrl + TTask Execution Time MeasurementCtrl + EConversionF11Syntax CheckCtrl + F11	Output Window	Ctrl + F5
Information WindowCtrl + F8Make Cross ReferenceCtrl + RTrace Back Cress ReferenceCtrl + -Trace Forward Cross ReferenceCtrl + Shift + -PLC OperationCtrl + F10MonitorCtrl + MData ModifyAlt + DForcible On/OffAlt + SForcible ResetAlt + RBreakpoints WindowCtrl + F9Sampling TraceCtrl + TTask Execution Time MeasurementCtrl + EConversionF11Syntax CheckCtrl + F11	Error Window	Ctrl + F7
Make Cross ReferenceCtrl + RTrace Back Cress ReferenceCtrl + -Trace Forward Cross ReferenceCtrl + Shift + -PLC OperationCtrl + F10MonitorCtrl + MData ModifyAlt + DForcible On/OffAlt + SForcible ResetAlt + RBreakpoints WindowCtrl + F9Sampling TraceCtrl + TTask Execution Time MeasurementCtrl + EConversionF11Syntax CheckCtrl + F11	Information Window	Ctrl + F8
Trace Back Cress ReferenceCtrl + -Trace Forward Cross ReferenceCtrl + Shift + -PLC OperationCtrl + F10MonitorCtrl + MData ModifyAlt + DForcible On/OffAlt + SForcible ResetAlt + RBreakpoints WindowCtrl + F9Sampling TraceCtrl + TTask Execution Time MeasurementCtrl + EConversionF11Syntax CheckCtrl + F11	Make Cross Reference	Ctrl + R
Trace Forward Cross ReferenceCtrl + Shift + -PLC OperationCtrl + F10MonitorCtrl + MData ModifyAlt + DForcible On/OffAlt + SForcible ResetAlt + RBreakpoints WindowCtrl + F9Sampling TraceCtrl + TTask Execution Time MeasurementCtrl + EConversionF11Syntax CheckCtrl + F11	Trace Back Cress Reference	Ctrl + -
PLC OperationCtrl + F10MonitorCtrl + MData ModifyAlt + DForcible On/OffAlt + SForcible ResetAlt + RBreakpoints WindowCtrl + F9Sampling TraceCtrl + TTask Execution Time MeasurementCtrl + EConversionF11Syntax CheckCtrl + F11	Trace Forward Cross Reference	Ctrl + Shift + -
MonitorCtrl + MData ModifyAlt + DForcible On/OffAlt + SForcible ResetAlt + RBreakpoints WindowCtrl + F9Sampling TraceCtrl + TTask Execution Time MeasurementCtrl + EConversionF11Syntax CheckCtrl + F11	PLC Operation	Ctrl + F10
Data ModifyAlt + DForcible On/OffAlt + SForcible ResetAlt + RBreakpoints WindowCtrl + F9Sampling TraceCtrl + TTask Execution Time MeasurementCtrl + EConversionF11Syntax CheckCtrl + F11	Monitor	Ctrl + M
Forcible On/OffAlt + SForcible ResetAlt + RBreakpoints WindowCtrl + F9Sampling TraceCtrl + TTask Execution Time MeasurementCtrl + EConversionF11Syntax CheckCtrl + F11	Data Modify	Alt + D
Forcible ResetAlt + RBreakpoints WindowCtrl + F9Sampling TraceCtrl + TTask Execution Time MeasurementCtrl + EConversionF11Syntax CheckCtrl + F11	Forcible On/Off	Alt + S
Breakpoints WindowCtrl + F9Sampling TraceCtrl + TTask Execution Time MeasurementCtrl + EConversionF11Syntax CheckCtrl + F11	Forcible Reset	Alt + R
Sampling TraceCtrl + TTask Execution Time MeasurementCtrl + EConversionF11Syntax CheckCtrl + F11	Breakpoints Window	Ctrl + F9
Task Execution Time MeasurementCtrl + EConversionF11Syntax CheckCtrl + F11	Sampling Trace	Ctrl + T
Conversion F11 Syntax Check Ctrl + F11	Task Execution Time Measurement	Ctrl + E
Syntax Check Ctrl + F11	Conversion	F11
	Syntax Check	Ctrl + F11

2-7-5 Tool Menu- Customize Instruction Jog

This command is used to customize the "Instruction Jog" bar.

◆ Click [Tools] > [Customize Instruction Jog]. The following dialog box opens.

Customize In	struct	ion Jog										X
	Instructi	ion <u>J</u> og:										
	View	Group		F2	F3	F4	F5	F6	F7	F8	F9	
		Contact/Outpu	ıt(1)	LD	LDI	LD+	LD-	OUT	SET	RST	USERFB	
		Contact/Outpu	ıt(2)	LD+	LD-	NOT	OUTI	OUT+	OUT-	OUTSC		
Down		Contact/Outpu	ıt(3)	LD (OR)	LDI (OR)	LD+(OR)	LD- (OR)	OUT (OR)	SET (OR)	RST (OR)		
	 Image: A set of the set of the	Timer/Counter		TON	TOF	TMB	TP	CTU	CTD	MR	RCT	
Add Bow		Transfer		MOVE	BMOVE	BDMPX	BMPX	FMOVE	LMOVE	XCH	NEG	
Add Tow		Arithmetic		ADD	SUB	MUL	DIV	ABS	SIN	COS	TAN	
Delete		Conversion		LD>	LD>=	LD=	LD<>	LD<=	SHL	SHR		
Row		Logical		AND_AW	OR_AW	XOR_B	XOR_AW	NOT_AW				
	Apply Delete Assortment: Instruction List: All Instruction Description Contact/Dutput Transfer ABS Absolute value of signed integer Atimetic ABS_R Absolute value of real number							E Branch]		<u>D</u> efault	
	Transfer ABS Arithmetic ABS_R Arithmetic ADS Logical ADC Compare ADCO String ADD Time ADD_T_T Timer/Counter ADD_R System FB ADD_T_T Others ADD_T_T			Ad Ad Ad DT_T Ad R Ad T_T Ad	dutate the and of d 32-bit integer w d 32-bit integer w dition two numbe ds DT and TIME dition two real nu ds TIME ds TOD, and TIM	nne nith carry nith carry and out r imber IF	(put the c			ОК	Cancel	

• Up: Selected group moves up.

• Down: Selected group moves down.

• Add Row: New group is added.

- Delete Row : Selected group deleted.
- Apply: Selected instruction is applied. Alternatively, you can select instruction and double-click it.
- Delete: Selected instruction is deleted. Alternatively, you can select instruction and press the [Del] key.
- Branch: Contact or Coil instruction is changed with branch (OR).

• Default: Goes back to the default setting.

<How to make new group>

◆ Click the [Add Row] button. A new group is added. Enter a group name.

	Instruction	ion Jog:	E2	E2	EA	EE	L EC	E7	E0	E9
	View		10	F3	F4	FJ ID	PO		FO	F3
<u>U</u> р		Contact/Dutput(T)	LD		LD+	LD-	001	SEI	RSI	USERFB
		Contact/Uutput(2)	LD+	LD-	NUT	UUII	001+	001.	UUTSC	
Down		Contact/Output(3)	LD (OR)	LDI (OR)	LD+(OR)	LD- (OR)	OUT (OR)	SET (OR)	RST (OR)	
		Timer/Counter	TON	TOF	TMB	TP	СТИ	CTD	MB	RCT
Add Bow		Transfer	MOVE	BMOVE	BDMPX	BMPX	FMOVE	LMOVE	XCH	NEG
		Arithmetic	ADD	SUB	MUL	DIV	ABS	SIN	COS	TAN
Delete		Conversion	LD>	LD>=	LD=	LD<>	LD<=	SHL	SHR	
Row		Logical	AND_AW	OR_AW	XOR_B	XOR_AW	NOT_AW			
		Communication								
								ו		
	Assortn	ment: Instruct	ion List:	Apply (Delete		⊤ <u>B</u> ranch]		<u>D</u> efault

Assign [R_READ] to [F2] key. Select [R_READ] from the Instruction list, and double-click it or click the [Apply] button. [R_READ] is assigned to the [F2] key.

stomize lı	nstruct	ion Jog								
	Instructi	ion <u>J</u> og:								
	View	Group	F2	F3	F4	F5	F6	F7	F8	F9
	~	Contact/Output	t(1) LD	LDI	LD+	LD-	OUT	SET	RST	USERFB
	V	Contact/Output	t(2) LD+	LD-	NOT	OUTI	OUT+	OUT-	OUTSC	
Down	~	Contact/Output	t(3) LD (OR)	LDI (OR)	LD+(OR)	LD- (OR)	OUT (OR)	SET (OR)	RST (OR)	
	~	Timer/Counter	TON	TOF	TMB	TP	CTU	CTD	MR	RCT
	V	Transfer	MOVE	BMOVE	BDMPX	BMPX	FMOVE	LMOVE	XCH	NEG
Add <u>R</u> ow	V	Arithmetic	ADD	SUB	MUL	DIV	ABS	SIN	COS	TAN
Dalata	V	Conversion	LD>	LD>=	LD=	LD<>	LD<=	SHL	SHR	
R <u>o</u> w	 Image: A set of the set of the	Logical	AND_AW	OR_AW	XOR_B	XOR_AW	NOT_AW			
	V	Communication	R_READ							
	Assort	ment:	Instruction List:	Apply	D <u>e</u> lete		⊤ <u>B</u> ranch]		<u>D</u> efault
	All Contai Progra Transf Arithm Conve Logica Compa String Time Time System	ct/Output am fer estic arsion al are /Counter m FB	Instruction C M_OPEN S. M_RECEIVE R M_SEND S. PULSE_CNT C. PULSE_OUT O PWM O (F_READ R R_TRIG W R_WRITE W BEAD R BEAD R	Description et up the destinat eceives message ends message to ounts a specified utputs a specified utputs a pulse tra eads data in direc frites data in direc frites data in direc						

♦ Using the same procedure, assign other function keys.

Customize In	struct	ion Jog										X
	Instructi	ion <u>J</u> og:										
	View	Group		F2	F3	F4	F5	F6	F7	F8	F9	
	 Image: A start of the start of	Contact/Outpu	t(1)	LD	LDI	LD+	LD-	OUT	SET	RST	USERFB	
	✓	Contact/Outpu	t(2)	LD+	LD-	NOT	OUTI	OUT+	OUT-	OUTSC		
Down	 Image: A set of the set of the	Contact/Outpu	t(3)	LD (OR)	LDI (OR)	LD+ (OR)	LD- (OR)	OUT (OR)	SET (OR)	RST (OR)		
	 Image: A start of the start of	Timer/Counter		TON	TOF	TMB	TP	CTU	CTD	MB	RCT	
	 Image: A start of the start of	Transfer		MOVE	BMOVE	BDMPX	BMPX	FMOVE	LMOVE	XCH	NEG	
Add Tow	✓	Arithmetic		ADD	SUB	MUL	DIV	ABS	SIN	COS	TAN	
Delete	 Image: A set of the set of the	Conversion		LD>	LD>=	LD=	LD<>	LD<=	SHL	SHR		
Row	 Image: A set of the set of the	Logical		AND_AW	OR_AW	XOR_B	XOR_AW	NOT_AW				
	 Image: A start of the start of	Communication	ı	R_READ	R_WRITE	M_OPEN	M_SEND	M_RECEIVE				
				A	pply C	elete		E Branch			Default	
	Assort	nont:	Instruct	ion List								
	All	nent.	Instruct	ion List. Intion De	soriation							
	Conta	ct/Output	MOF	PEN Set	up the destination	on module with v	which me					
	Progra Transf	am fer	M_RE	CEIVE Red	ceives message	from a destinatio	n module					
	Arithm	etic	M_SE	ND Ser FONT Cou	nds message to a upto a specified r	a destination mod	dule spec					
	Logica	al	PULS	E_OUT Out	puts a specified	pulse train at a sp pulse train at a s	pecified					
	Compa	are	PWM	Out	puts a pulse trair	n, whose On stal	te period 📄					
	String		R_RE	AD Rea	ads data in direct	t addressing mod	de from a					
	Timer/	/Counter	B WF	RITE Wri	tes data in direct	addressing mod	le from a					
	Syster	n FB	READ	_B Rea	ads variables of o	different resource	e within t 🧹			OK	Cancel	
	Uthers	\$	READ	IW Rea	ads variables of r	different resource	e within t 🔛					

* Default Group name and function key setting can also be changed.

2-7-6 Tools - Option

This command executes the option settings of the loader shown below.

- Online
 Sets online operations.
- Conversion
 Sets operations of conversion.
- Backup ⇔ Sets backup operations.
- System Definition
 Sets operations for system definition registration

(1) General

You can make general settings of the loader.

Options		×
<u>C</u> ategory:		
General Directories Project Online Conversion Backup System Definition	Language (*): Address display mode (*): MICREX-F ▼ Last project is opened at the time of starting. (*) <u>Reset the window layout (*)</u>	
	(*) Requires restart	
	OK Cancel	

· Language:

You can change the language of the loader. Choose Japanese or English.

• Address display mode:

If MICREX-F is selected, word addresses are expressed in decimal.

If FLEX-PC is selected, word addresses are expressed in hexadecimal.

- Last project is opened at the time of starting: If this option is checked, the last opened project is opened when the loader is started.
- Reset the window layout:
- The following items of the window layout are initialized. Sub window size and layout in the main window. Tool bar layout

(2) Directory

You can make settings of the file to open by default.

Options	×
<u>Category:</u> General Directories Project Online Conversion Backup System Definition	Projects: Ladder Library: Program Import: Click these buttons and set
	the folder to open by default.
	OK Cancel

(3) Project

You can make settings of projects.

Options		×
Options Qategory: General Directories Project Online Conversion Backup System Definition	 Hide protected programs on the project view Support non compressed project file Hide program name in the caption 	×
	OK Cancel	_

· Hide protected programs on the project view:

Check this option to hide protected programs (where a password is set by executing [Project] Menu > [Security] > [Protection Programs])

Support non compressed project file:

Usually, a project is saved as a compressed type file (*.Zpj3). If this option is checked, you can also choose non compressed type (*.Spj3 file and folders) when saving a project.

When you use a PID expansion FB and set parameters, you need to choose non compressed type.

• Hide program name in the caption:

Choose whether or not to display a program name in the caption.



(4) Online

You can make settings of online operations.

Options		×
Options Category: General Directories Project Online Conversion Backup System Definition	PLC Operation Show the failure analysis automatically Permit the use of Initial Run Monitor Verify before the monitor is started	_
	Allow editing of being monitored Monitor is started automatically after load program Load to PLC Permit load to PLC only the program Initial setting Load the changed program into PLC Show the confirmation before download to PLC Permit to download Zip file Load from PLC Permit to provide the provide the Tip file	_ _
	Automatic import of the Ex.FB © Don't import automatically © Import automatically © Import without a confirmation message automatically OK Cancel	

• Show the failure analysis automatically:

When you open the failure diagnosis window, the failure analysis screen automatically opens if the PLC detects an error. Only SPH300 supports this function.

- Permit the use of Initial Run: "Initial Run" of the "PLC operation" command is enabled. Note that the retain memory is cleared when "Initial Run" is executed.
- Verify before the monitor is started:
 Before monitoring the PLC, the leader

Before monitoring the PLC, the loader program is compared with the PLC program.

- Allow editing of being monitored:
 A program can be edited during the monitoring. Instead, force setting operation of contacts and coils that can be made by double-click is disabled. To make force setting, use the right-click menu.
- Monitor is started automatically after load program: After a program is loaded (all program transfer), monitoring is automatically started.
- Permit load to PLC only the program:

When a program is loaded to the PLC, the program and system definition are usually loaded in combination. If this option is checked, only a program can be loaded. When you change the system definition, make sure to load both the program and system definition.

- Show the confirmation before download to PLC: When [Load the changed program into PLC] is executed, the confirmation dialog is shown.
- Permit to download Zip file:

When [Load the changed program into PLC] is executed, a Zip file (tag and program name information) is also loaded to the PLC.

• Restore the project name based on the Zip file:

Select whether or not to read the project name when a program is read from the PLC.

Project name	
SX-Programmer Standard - MachineB	[Online] [Ladder0]
File Edit View Project Online Co	nversion <u>T</u> ools <u>W</u> indow <u>H</u> elp
🛅 • 📂 • 🔜 🏄 🕰 X 🗈 🛍 A	A 이 언 🎬 🖾 🗟 🖀 🚰 🚰 📾 🤜 📖 📖 🜉 📖 🍦 💭 🌉
Project View - 👎 🗙	Instruction Jog 🛛 🕹 🗸
Project 'MachineB'	Contact/Output(1) 🛟 ⊣ ⊣ ⊣/⊢ ⊣↑⊢ ⊣↓⊢ -()− -(S)− -(R)− U
Elesource (CPU0): NP1PM-48E	F2 F3 F4 F5 F6 F7 F8
	Ladder0 🗸 🗸
Default: Default Ladder0: (0) Ladder1: (1) Unassigned Programs	X1.5 X1.1 THO TZ.0 Image: Contract of the second se
Simulation	Datg ut0 Timer0 Ti_sety I 3
File Defines	Image: state
0.1K	Online Run

• Automatic import of the Ex. FB:

When standard expansion FBs or CSV interface FBs are used in the PLC or user ROM card, select whether or not to import them automatically.

- [Don't import automatically]: Import is not performed automatically.
- [Import automatically]: The import confirmation message is shown, and then import is performed automatically.
- [Import without a confirmation message automatically]: Import is performed automatically without a confirmation message.

(5) Conversion

You can make setting of conversion operations.

Options			×
<u>C</u> ategory:			
General Directories	<u>P</u> rogram size:	Maximum 💌	
Project Online	<u>F</u> B instance size:	Maximum 💌	
Conversion Backup	Permit the use of ste	o control	
System Definition	The area for the last a step control area.	100 words of the retain memory area is set as	
	The <u>d</u> uplication of the	timer / counter assumes it warning	
	🗌 Display a <u>c</u> onfirmation	n when running the conversion	
	🔲 D <u>i</u> sable the conversio	n and conversion all	
		OK Cancel	

• Program size:

Set the size of a program.

• FB instance size:

Set the data size of a user function block.

If the size set here is exceeded, an error occurs when the [Conversion] command is executed.

When "Maximum" is selected, the program and FB instance sizes are checked according to the maximum size of the target CPU.

The table below shows the maximum size of each CPU.

Series	Туре	Program size	FB instance size
SPH2000	NP1PH-08	4000 *4	2048
	NP1PH-16	4090	4096
SPH300	NP1PS-32/32R	- 8192 *2	4096 *3
	NP1PS-74/74R		
	NP1PS-117/117R		
	NP1PS-245R		4096
SPH2000	NP1PM-48R/48E	16384	16384 *4
	NP1PM-256E/256H	16384	16384
SPH3000 SPH3000MM	NP1PU-048E/128E/256E NP1PU2-048E/256E	16384	16384
SPB	NW0P20/NW0P30	2048	
	NW0P40/NW0P60	4096	
Board (SPB)	NW3P08-41C	8192	256
	NW3P16-42C		
	NW3P32-42C		

*1 When the CPU version is earlier than V**30, the maximum size is 2048.

*2 When the CPU version is earlier than V**62, the maximum size is 4096.

*3 When the CPU version is earlier than V**63, the maximum size is 256.

*4 When the CPU version is earlier than V**02, the maximum size is 4096.

• Permit use of step control:

Check this option to use SC (step control) instructions. In this case, the last 100 words of the retain memory (WL) is used for SC.

 The duplication of the timer / counter assumes it warning: If timer/counter coil addresses are overlapped in the same program instance, it is handled as a warning. If this option is unchecked, it is handled as an error.

 Display a confirmation when running the conversion: When you execute [Conversion] menu > [Conversion] or [Conversion All], the following message to confirm that "Load the changed program into PLC" command is disabled is displayed.



• Disable the conversion and conversion all:

The [Conversion] and [Conversion All] commands are disabled.

(6) Backup

You can make settings of backup operations.

Options	×
Options <u>Category:</u> General Directories Project Online Conversion Backup System Definition	Backup project when load from PLC or load the changed program into PLC AutoSave Interval Go Minute Quantity (1-99): 10 Backup folder: D¥My Documents¥Fuji Electric¥SX-Programmer Standard Browse
	OK Cancel

• Backup project when load from PLC or load the changed program into PLC:

The project is automatically backed up when "Load from PLC" or "Load the changed program into PLC" is executed.

In addition, when "Load the changed program into PLC" is executed, changed contents are saved as a log.

AutoSave

The currently open program is automatically saved at certain intervals. You can set the interval between 1 to 99 minutes.

<Default save folder>

<My Document>/Fuji Electric/SX-Programmer Standard The save folder can be changed.

<File name>

-UPLC001.Zpj3 (When "Load from PLC") -DPLC001.Zpj3 (When "Load the changed program into PLC") -DL001.Log (Log file) -AUTO_SAVE001.zpj3 (AutoSave file)

The number prefixed to a file name is incremented like 001, 002, 003 by every saving. The file with the largest number is the oldest. "001" is the latest file.

"Quantity (1-99)" specifies the number of backup files. If the number of backup files exceeds this value, the oldest file is deleted.

(7) System Definition

You can make setting of operations for system definition registration.

If "Select the last insert module" is checked, the same type module that you inserted last time is automatically displayed when inserting a module in the system definition. This function is convenient to define multiple same type modules. If unchecked, the module at the top of the list is displayed when inserting a module.

Options		×
<u>C</u> ategory:		
General Directories Project Online Conversion Backup System Definition	Select the last insert module	
1	OK Cancel	

2-8 Window menu

In the [Window] menu, select a program or function block to bring to the front of other windows that are currently opened. Alternatively, you can click the tab.



2-9 Help menu

The "Help" menu contains the following commands:

- About ⇒ Shows the version of the loader.
In the system definition, set entire system operations, register modules to be used under the configuration, and set parameters.

3-1 System Definition of SPH Series

The following items are specified in the system definition of SPH series.



3-1-1 Registering Modules

(1) Module registration

With the MICREX-SX, you need to register all the modules to be used under one configuration. The following explains module registration procedures using the sample system configuration below.

<Sample system configuration>

Empty slot (reserved for future installation of modules)



◆ Double-click "System Definition" in the project tree. The system definition screen opens.



Change the base board to a 8-slot base that is actually used. Select the base board, and then click the [Properties] button. The "Module property" dialog appears.



Select "NP1BS-08 8slots Base" from the [Outline specification] list box, and then click the [OK] button. The base board changes to the 8-slot base.



Register modules sequentially from the left of a base board. Since a power supply and a CPU module are registered by default, register the 16-point input module. To register (add) the module below the CPU module, select the CPU module, and then click the [Insert] button. The "Module insert" dialog box opens.



Select the module (NP1X1606-W DC/AC Input 16points) according to the actual configuration. For the SX bus station No., any number from 1 to 238 can be specified. However, in general, 1, 2, 3, ... are assigned from the one on the right of the CPU module in order. Select a module, and then click the [OK] button. The module is registered.



Register modules in the same manner. If you want to mount a module in the future and leave the slot unused as shown in the system configuration, specify the SX bus station number and the module to be mounted in the same manner as other modules, check "No equipment," and then click the [OK] button.

X bus station No.: Circu 4 Module attribute type	uit No.:	Name: Ry Output 16points	OK
4 式 🗾		Ry Output 16points	
Module attribute type			
		- Outline specification:	Uancel
Baseboard unit type m	odule	Type Outline specification	Parameter
C Individual type module		NP1Y64U09P1 Source Output 64points	
C Block type module		NP1Y06S SSR Output 6points	нер
C Board type module		NP1Y08R-04 Ry Output 8points NP1Y16R-08 Ry Output 16points	
		NP1Y32T09P1-A Pulse Sink Output 32poin	- insert position-
Module group type	0.5		
C CPU	C Function	Tupe	S Addition
Processor link Direct L/0		NP1Y16R-08	🔽 No equipme
C 1/0 master	C Beseboard	Consumed current(mA):	
C Slave	C Optical link	176	
C Remote I/0	C Other		
o equipment] button	[No equipment batch se	tting] button	
File Edit Vie	efinition [No equi	pment batch release] button	
System	structure item properties pts Base : NP1B5-08	-	
	CPU : CPU-0 : Resource : NP1P	-22 5-117	
	Direct I/O : SX station No1 : D	C/AC Input 16points : NP1X1606-W	
	Direct I/O : SX station No2 : D Direct I/O : SX station No3 : Si	C Input 32points : NP1X3206-W ink Output 16points : NP1Y16T09P6	
	Direct I/O : SX station No4 : R	y Output 16points : NP1Y16R-08	
	The module is register	red with "No equipment" mark.	

* No equipment setting of modules/units registered in the system definition can be made or canceled in a batch on the system definition screen. To make or cancel the no equipment setting of the entire system, select "System structure," and then click the "[No equipment batch setting] button or [No equipment batch release] button. Likewise, to make or cancel no equipment setting of modules/units on a base board, select the base board, and then click each button. For units connected to a remote I/O master module, select the remote I/O master, and then click each button.

(2) Module parameter setting

The following describes the procedure for setting parameters of MICREX-SX series modules, using input and output modules as an example. Refer to "3-1-2 CPU Parameter Setting" for parameter setting of CPU modules. For other modules, refer to the manual of each individual module.

Select the module for parameter setting on the system definition screen, and then click the [Properties] button. The "Module properties" dialog box appears.

[Properties] button			
System definition			
File Edit View Tool Help			
⊡			
System properties			
🖻 🖷 🛄 8slots Base : NP1B5-08			
Power : AC Power(35W) : NP15-22			
CPU : CPU-0 : Resource : NP1PS-117			
Direct I/O : SX station No1 : DC/AC Input 16p Direct I/O : SX station No2 : DC Joseph 32pain	00Ints : NP1X1606-W		
Direct I/O : 5X station No2 : DC Input 32point	IS : NP1X3200-W Note : NP1X16T09P6		
Direct I/O : SX station No4 : By Output 16poi	nts : NP1Y16R-08		
Direct I/O : SX station No5 : Sink Output 32pc	bints : NP1Y32T09P1		
\checkmark			
		V	
Module properties			
SX bus station No.: Circuit No.:	Name:		
	DC/AC Input 16points		
		Cancel	
Module attribute type	Outline specification:	Click h	ere.
Baseboard unit type module	Type Outline specification 🔺	Parameter	
C Individual type module	NP1X1606-W DC/AC Input 16points		
C Block type module	NP1X1607-W DC Input 16points(DC48 NP1X3206W DC Input 32points	Help	
C block ope module	NP1X6406-W DC Input 64points		
C Board type module	NP1X3206-A High Speed DC Input 32		
Madda areas have	NP1X0810 AC100 Input 8points		
Moaule group type			
C CPU C Function			

Click the [Parameter] button. The parameter setting screen for the module appears.
 The parameter setting screen differs depending on the module type. The following shows the setting screen for the input

module.	
Direct I/O parameter setting	
Bunning mode Digital filter constant setting C Not setting	
Setting Setting value 3ms	Set the input filter time.
Digital filter mode setting O UP/DOWN Reset	
OK Cancel Help	

Set each item and then click the [OK] button to return to the "Module properties" dialog box. Click the [OK] button to complete the registration.

Note: Parameter setting for each module can also be performed at the time of module registration.

<Parameter setting for output module>

Two parameters can be set for the digital output module.

1) HOLD Definition

If the system fails and the CPU module stops, this setting is used to retain the output condition immediately before the failure occurs or retain, while the CPU stops, the output condition immediately before the CPU stops.

2) System DO (Output) Definition

A bit which outputs the operating status of the system regardless of the application can be defined in each configuration. It is set to ON when the entire system is operating normally and OFF if a fatal fault occurs in the system or the system stops. When a nonfatal fault occurs in the system (the system is operating), it is not set to OFF. Only bit 0 of the output module can be set.

<Operating procedure>

- Select the digital output module for parameter setting on the system definition screen and then click the [Properties] button. The "Module properties" dialog box appears.
- ◆ Click the [Parameter] button. The "Direct I/O parameter setting" dialog box appears.

Direct I/O parameter setting	ı X
HOLD Definition	
HOLD Definition © RESET mode © HOLD mode	System digital output definition
	OK Cancel Help

- ◆ To perform HOLD definition, select "HOLD mode."
- To perform System DO definition, check "Select system digital output."
- ◆ After setting parameters, click the [OK] button.

(3) Module deletion

The following describes the procedure for deleting a registered module.

♦ Select a module to be deleted on the system definition screen and the click the [Delete] button.



◆ Click the [Yes] button. The selected module is deleted.

👬 System definition
File Edit View Tool Help
System structure
System properties
🗄 📲 8slots Base : NP1BS-08
Power : AC Power(35W) : NP1S-22
🗄 Direct I/O : SX station No1 : DC/AC Input 16points : NP1X1606-W
🗄 Direct I/O : SX station No2 : DC Input 32points : NP1X3206-W
🔤 🗄 Direct I/O : SX station No3 : Sink Output 16points : NP1Y16T09P6
Direct I/O : SX station No4 : Ry Output 16points : NP1Y16R-08

3-1-2 CPU Parameter Setting

Parameter settings for the CPU module include "CPU running definition", "Memory allocation setting", "I/O group Setting", "Fail-soft operation setting" and "Constant scanning setting (only for SPH2000/3000)".

(1) CPU running definition

Select a CPU on the system definition screen and then click the [Properties] button. The "Module properties" dialog box for the CPU appears.

Module properties			×	
CPU No.: Ci	rcuit No.:	Name[Resource name] :	ок	
	T	Resource		
Module attribute type —		Outline specification:	Cancel	[Parameter
Baseboard unit type	module	Type Outline specification	Parameter	button
C Individual type modu	le	NP1PM-256E SPH2000-256E		
C Block type module		NP1PM-48E SPH2000-48E		
C Board type module		NP1PS-245 High Performance CPU2 NP1PS-117 High Performance CPU1		
Module group type		NP1PS-74 High Performance CPU7 NP1PS-32 High Performance CPU3		
• CPU	C Function			
C Processor link	C Communication	Туре:	_	
C Direct I/O	C Power	NP1PM-48R	No equipment	
C I/O master	C Baseboard	Consumed current(mA):		
C Slave	C Optical link	200		
C Remote I/O	C Other			

 Click the [Parameter] button. The "CPU parameter" dialog box appears. The dialog consists of four tab pages. The "CPU running definition" tab page opens first.

CPU parameter	×
CPU running definition Memory allocation setting 1/0 group setting F. Watch Dog Timer setting C Default	ail-soft operation setting
C Specify WDT time 4035 ms Running specification at power on C RUN=Run/TERM=Run C RUN=Run/TERM=Last State C RUN=Stop/TERM=Stop	
Compulsion setting hold state © OFF(Not hold) © ON(Hold Compulsion setting) With a present model.	Execution band ratio setting Application 6 : 4 System
Constant scanning setting No(Scanning usually) C YES Scan time ms	User ROM run
Note: "CPU parameter" dialog box differs depen because each CPU has the different funct For more details, refer to the user's manu	Inding on the CPU type tions. al "Instruction (FEH588)."

(2) Memory allocation setting

Set the size of the data memory in the CPU module.

The default size of the data memory is predetermined for each CPU module, but you can change the size of individual memory area in 0.5-k word steps as needed. For more details of the memory of individual CPU modules, refer to the user's manual "Instruction (FEH588)."

1) SPH200/300 series

Click the [Memory allocation setting] tab on the [CPU parameter] dialog box. The [Memory allocation setting] tab page opens.

	CPU parameter	×
For SPH300, all the remainder after setting these 3 memory capacities becomes the capacity of non-retain memory. For standard CPU modules, the user can set the capacity of non-retain memory, and the remainder becomes the memory capacity for initial data.	CPU running definition Memory allocation setting I/O group setting Fail-soft operation setting Range of word address Non retain memory 8.0 KW WM0000000 · WM0008189 Retain memory Image KW WL0000000 · WL0003995 User FB memory 4.0 KW System FB memory 16.0 KW	
Edge detection, counter, addition timer and timer can also be set for system FB. The remainder becomes the area for other FBs.	Initial data 320 Default Detail of system FB memory Edge detection 1024 Point x 2W 2048 W Counter 256 Point x 4W 1024 W Additional timer 128 Point x 8W 1024 W Timer 512 Point x 8W 4096 W Other system FB area 8192 W	
	OK Cancel Help	

Enter the size of each memory in the text box, and then click the [OK] button. Click the [Default] button when you want to reset to default values.

2) SPH2000 series (NP1PM-48R/48E)

Click the [Memory allocation setting] tab on the [CPU parameter] dialog box. The [Memory allocation setting] tab page opens. Make the settings for non-retain memory and other types of memory.

	CPU parameter			x
If memory other than non-retain general memory is changed,	CPU running definition Memory allocati Total Size : 96.0 KW	on setting I/O group setting F	Fail-soft operation setting IP-addr	ess/Gateway setting
the non-retain general memory and memory selected via the automatic calculation button become a buffer, increasing or	Memory Size 64.0 KW	64.0 KW	Hange of word address	
decreasing in size.		Auto	Range of word address	
In the example of the right figure	Multi CPU non retain memory:	0.0 KW (C (B)	None	
when the multi-CPU non-retain	Retain memory:	8.0 KW O(F)	WL0000000 - WL0008091	
memory, retain memory, multi-CPU retain memory, or	Multi CPU retain memory:	0.0 KW O (G)	None	Default
user FB memory is changed, the	User FB memory:	8.0 KW C (J)		
the automatic calculation button	System FB memory:	16.0 KW (* (K)		
automatically grows or shrinks.	Initial data: Detail of system FB memory—	3200		
	Edge detection: 1024	Point x 2W 2048 W	Set whether to make	a buffer when
If the number of edge detection, counter, or addition timer points	Counter: 256	Point x 4W 1024 W	changing each memo	ry, etc.
is changed, the system-FB	Additional timer: 128	Point x 8W 1024 W		
shrinks.	Timer: 1512	Point x 8W 4096 W		
		W		
			OK Cano	el Help

Enter the size of each memory in the text box, and then click the [OK] button. Click the [Default] button when you want to reset to default values.

* If inter-CPU memory access is performed using a processor bus on a SPH2000/3000 series multi-CPU system, the following memory area needs to be reserved.

For general memory: memory area must be reserved in multi-CPU non-retain memory. For retain memory: memory area must be reserved in multi-CPU retain memory.

2) SPH2000 series (NP1PM-256E)

 Click the [Memory allocation setting] tab on the "CPU parameter" dialog box. The [Memory allocation setting] tab page opens. Make the settings for non-retain memory and other types of memory.

	CPU parameter	X
If the memory size is changed, the non-retain general memory and memory selected via the automatic calculation button become a buffer, increasing or decreasingin size.	CPU running definition Memory allocati Total Size : 2048.0 KW Memory Size 1664.0 KW Non retain memory:	ion setting I/D group setting Fail-soft operation setting IP-address/Gateway setting Range of word address 1664.0 KW WM0000000 - WM1703933
In the example of the right figure, when the normal memory size, multi-CPU non-retain memory, multi-CPU retain memory, or user FB memory is changed, the system FB memory selected via the automatic calculation button automatically grows or shrinks.	Memory Size Memory Size Multi CPU non retain memory: Multi CPU retain memory: User FB memory: System FB memory: Normal Memory Size Retain memory:	Auto Range of word address 0.0 KW C (B) None 224.0 KW C (G) WL0032768 · WL0262143 64.0 KW C (J) Default 64.0 KW C (K) Default 32.0 - KW KW
In the example of the right figure, when the size of the retain memory, or user FB normal memory is changed, the system FB normal memory selected via the automatic calculation button automatically grows or shrinks.	User FB normal Memory: System FB normal Memory: Initial data:	8.0 KW C (1) 16.0 KW C (2) Detail(4) Detail(4) 3200 A CPU before V06 is used.
		OK Cancel Help

To change the number of edge detection, counter, addition timer or timer points, click the [Detail] button. The "Detail of system FB memory" dialog box opens. By clicking the corresponding tab, display the "Detail of system FB memory" screen or "Detail of system FB normal memory" window.

On this dialog box, change the number of points of each item. When you change the number, the value of "Other system FB area" on the lower part of the screen is changed. Click the [OK] button to complete the setting.

Detail of system FB	8 memo	ry				x
Detail of system FB	memory	Detail of s	ystem F	B norm	al memory	
Edge 🛛	1096	Point x 2W	/ =	8192v	v	
Counter 1	024	Point x 4W	/ =	4096V	v	
Additional Timer 5	512	Point x 8V	/ =	4096V	V	
Timer 2	2048	Point x 8V	/ =	16384	W	
Other system FB a	rea			-	32768W	
	04		Canad	. 1	Hala	
	UK	<u> </u>	Lance		нер	

• Click the [Default] button on the [Memory allocation setting] tab page when you want to reset to default values.

<Note>

With V07 or later software version of NP1PM-256E, the memory arrangement has been changed for high-speed access of the system FB memory.

In the user FB memory and system FB memory, the user FB normal memory and system FB normal memory are accessible at high speed. When using user FBs, the user FB normal memory and system FB normal memory are used first.

Software version of NP1PM-256E	
V06 or earlier	Not supported (conventional mode)
V07 or later	High-speed access supported

When using V6 or earlier software version of NP1PM-256E, check "A CPU before V06 is used." If checked, the following dialog box appears.

Configura	ition
?	A CPU before V06 was specified. O clears a 'User FB normal memory' and 'System FB normal memory'.And, the size set up is added to the 'Retain memory'.
	OK Cancel

◆ Click the [OK] button to complete the setting.

Note: When using V6 or earlier software version of NP1PM-256E, be sure to check this option. Otherwise, programs cannot be loaded to the CPU.

(2) I/O group setting

Specify which task in which CPU controls input/output modules in the configuration.

- This setting is important for the CPU module to access the input and output of the modules.
- * When system definition is finished without I/O group setting, the I/O modules are automatically registered in the default task and a warning message appears.
- ◆ Click the [I/O group setting] tab in the "CPU parameter" dialog box. The "I/O Group Setting" tab page opens.

	Select a task. Only the tasks under	"Tasks" in the project t	ree are displayed.	
CPU parameter			×	
CPU running definition Me	emory allocation setting 1/0 group setting F	ail-soft operation setting	Specify output as refe refer to <input for="" refe<="" th=""/> <th>rence input. For details, rring output value>.</th>	rence input. For details, rring output value>.
Level: <u> DEFAULT</u>				
1/O List:	Input select:	Input for referring output v	value	
Direct I/0 : SX station Direct I/0 : SX station Direct I/0 : SX station Direct I/0 : SX station	n No1 : DC/AC In; n No2 : DC Input (n No3 : Sink Output n No4 : Ry Output <<(R) Output select	Click this butto modules selec	on to register the sted in the I/O List.	
	<u>>>[M]`</u>	Module o For regis	output can be registered tration procedure, refer t	on a point basis. o <output detail="" setting="">.</output>
•	<(N)			
	All cancel	OK	Cancel Help	
Only the modules of registered on the s	occupying the input and output areas system definition screen are displayed	out of the modules d in the "I/O List."		

Select (click) a module from the I/O List and then click the register button. The selected module is registered.

CPU parameter	
CPU running definition Memory allocation setting 1/0 group setting Fail-soft operation setting	
Level: DEFAULT Standard setting	- Registered module
I/O List: Input select: Input for referring output value	
Direct I/D : SX station No1 : DC/AC Input Direct I/D : SX station No2 : DC Input 3 Direct I/D : SX station No3 : Sink Output Direct I/D : SX station No4 : Ry Output (<(R)	
Output select Detail	
>>(M)	

◆ Register all the modules to be controlled and then click the [OK] button.

* It not possible to assign the same output to more than two CPUs or tasks.

<Standard setting>

When only one CPU is registered in the configuration and only the "DEFAULT" task controls I/O, modules can be registered in a batch.

Select "DEFAULT" for Level and then click the [Standard setting] button. The modules are automatically registered to the Input select box and the Output select box.



- Note 1: Modules having input/output area, such as a high-speed counter and a positioning module, need to be registered in both the [Input select] list box and the [Output select] list box.
- Note 2: In a multi-CPU system configuration, to reference output modules registered for other CPU modules, register the output modules in the [Input select] list box. Output modules that have already been registered in the [Output select] list box of another CPU module cannot be registered.

<Output detail setting>

In a multi-CPU system configuration, which CPU controls the module output can be specified on a bit or word basis.

Select a module for "output detail setting" from [Output select] and then click the [Detail] button.

CPU parameter	×
CPU running definition Memory allocation setting 1/0 group setting Fail-soft operation setting	
Level: DEFAULT Standard setting	
1/0 List: Input select: Input for referring output value	
Direct I/O : SX station No1 : DC/AC Input Direct I/O : SX station No2 : DC Input 3 Direct I/O : SX station No3 : Sink Output Direct I/O : SX station No2 : DC Input 32p >>(A) <<(R)	
Output select Detail	
<(N) Direct I/D : SX station No3 : Sink Dutput 1 Direct I/D : SX station No4 : Ry Dutput 16 <<(N)	
All cancel	
OK Cancel Help	

• When the digital output module is selected, the "Port mode IO Detail Setting" dialog box opens.

Port n	ode	10 [)eta	il Sel	ting													×	
Ø₩	F	E	D	С	В	A	9	8	7	6	5	4	3	2	1	0		16 point batch	
1₩	F	E	D	С	В	Α	9	8	7	6	5	4	3	2	1	0		16 point batsh	All bits are selected by default
2₩	F	E	D	С	В	A	9	8	7	6	5	4	3	2	1	0		16 point batch	
3₩	F	E	D	С	В	A	9	8	7	6	5	4	3	2	1	0		16 point batch	
										,	-		Com	1	1		Ц	ala I	
									10	<u>`</u>		_	Can	cel			-	eip	

◆ Click and set OFF the button corresponding to the bit to be controlled by another CPU.

Port m	ode I	0 D	etail	Set	ting	/											×
	-						·		5								
٥w	F	Е	D	С	В	А	9	8	7	6	5	4	3	2	1	0	16 point batch
)								
1₩	F	E	D	С	В	Α	9	8	7	6	5	4	3	2	1	0	16 point batch
<i>a.</i>	E	F	n	C	B	6	9	8	7	6	5	Л	3	2	1	n	16 point batch
299		-			D	\sim	9	0	r	0		7	9	-	'		To point batom
367	F	Е	D	С	В	A	9	8	7	6	5	4	3	2	1	0	16 point batch
0.11																	
									пк		٦.		Cano	el	1		Help
									51								

Note 1: The dialog box displayed when you click the [Detail] button differs according to the selected module.

<When the digital output module with pulse train output is selected>

Detail setting for digital output with pulse
Pulse setting
CH_0, CH_1 Pulse use
CH_2, CH_3 Pulse use
Port output data area setting
0W FEDCBA9876543210 16 point batch
1W F E D C B A 9 8 7 6 5 4 3 2 1 0 16 point batch
OK Cancel Help

<When the analog output module is selected>

00	01	02	03	04	05	06	07	All point batch
08	09	10	11	12	13	14	15	
16	17	18	19	20	21	22	23	
24	25	26	27	28	29	30	31	
32	33	34	35	36	37	38	39	
40	41	42	43	44	45	46	47	
48	49	50	51	52	53	54	55	
56	57	58	59	60	61	62	63	

Note 2: If you select a module that does not support "output detail setting," the dialog box for detail setting does not appear even if you click the [Detail] button.

<Input for referring output value>

In a multi-CPU system configuration, if you want to use the output of an output module used by another CPU as "Input" in an application program of the local CPU, register the bit or word to "Input select" for the I/O group of the local CPU. Note: This function can be used only for an output module that is actually mounted. For output modules registered as "no equipment," the output memory (Y) does not work on a program of the local CPU.

♦ Select the output module to be referenced, click the [>>] button to register it to "Input select".

CPU parameter	×
CPU running definition Memory allocation setting 1/0 g	roup setting Fail-soft operation setting
Level: DEFAULT Stand	ard setting
I/O List:	Input select: Input for referring output value
Direct I/0 : SX station No.1 : DC/AC Inp Direct I/0 : SX station No.2 : DC Input 3 Direct I/0 : SX station No.3 : Sink Output Direct I/0 : SX station No.4 : Ry Output <<(R)	Direct I/O : SX station No3 : Sink Output 1
	Output select Detail

◆ Click the [Input for referring output value] button. The "Port mode IO Detail Setting" dialog box appears.

Port ma	de I	0 D	etai	Set	ting													×	1
ow (F	E	D	С	В	A	9	8	7	6	5	4	3	2	1	0		16 point batch	
1W	F	Ε	D	С	В	A	9	8	7	6	5	4	3	2	1	0		16 point batch	All hits are selected by default
2₩	F	Е	D	С	В	A	9	8	7	6	5	4	3	2	1	0		16 point batch	
3₩/	F	E	D	С	В	A	9	8	7	6	5	4	3	2	1	0		16 point batch	
											1		Can	cel	1		F	lelo (
								_	014				Cari	501		_	-		1

Click and set OFF the button corresponding to the bit without output value reference.

Click the [OK] button.

Note: When referencing analog output or other output values, setting on a word basis is required. In this case, the "Memory mode IO Detail Setting" dialog box appears.

00	01	02	03	04	05	06	07	All point batch
08	09	10	11	12	13	14	15	
16	17	18	19	20	21	22	23	
24	25	26	27	28	29	30	31	
32	33	34	35	36	37	38	39	
40	41	42	43	44	45	46	47	
48	49	50	51	52	53	54	55	
56	57	58	59	60	61	62	63	

(3) Fail-soft operation setting

Even if a failure occurs in a module or unit on the SX bus and remote I/O (such as T-link), operations of other normal modules and units are continued. This operation is referred to as "fail-soft" operation

◆ Click the [Fail-Soft Operation Setting] tab in the "CPU parameter" dialog box. The "Fail-Soft Operation Setting" tab page opens.



Select a module for fail-soft operation setting and then click the [Register] button.



♦ After registering the modules for fail-soft operation setting, click the [OK] button.

Note: For expansion units on a remote I/O, fail-soft operation is registered for each unit. Fail-soft operation cannot be registered in units of modules.

3-1-3 System Property

On the System properties dialog box, "System Running Definition", "Redundancy setting", and "Fail-soft operation setting" can be specified. The following describes the procedure for setting system running definition and fail-soft operation setting.

(1) System running definition

The system running definition includes SX bus tact time setting, configuration check wait time setting, and initialization mode selection.

1) SX bus tact time

The SX bus tact time refers to the interval of data communication with modules (such as an I/O module) connected to the SX bus.

For SX bus tact, select 0.5, 1, 1.5, 2, 2.5, ... 9.5, and 10ms. The default value is 1.0ms.

2) Waiting time for structure check

When the power of the system is turned on, the CPU module starts configuration check of all modules on the SX bus. When all the modules has been activated within the time specified as "Waiting time for structure check", the system starts. When the system consists of multiple bases and the power of each base is turned on at different timing, adjust the tact time with "Waiting time for structure check."

(The default value of "Waiting time for structure check" is 20 seconds. It can be specified within a range from 1 to 180 seconds.)

3) Waiting time mode for structure check

Wait structure agreement : Wait structure matches to actual system until "Waiting time for structure check" time. Wait specified time : Wait until "Waiting time for structure check" time.

* This item is enabled in SPH200/300 only.

4) Initialization method

When the power of the system is turned on, the CPU module is initialized. This setting allows you to specify whether CPU module internal memory diagnosis is performed or not.

5) Start up system without CPU "0"

This setting allows you to specify whether the system is started up when "0" station does not exist in a system such as a redundant system.

 Select "System properties" in the system definition screen and then click the [Properties] button. The "System Running Definition" tab page of the "System properties" dialog box opens.

System properties	X
System Running Definition Redundancy setting Fail-	soft operation setting
SX bus tact: Default value(1.0ms)	Set the SX bus tact time.
Waiting time for structure check: 20 <u>★ (s)</u> Set	the waiting time for structure check.
Select initialization method	Waiting time mode for structure check
 Execute memory diagnosis 	Wait structure agreement
Omit memory diagnosis	C Wait specified time
Start up system without CPU''0'' Select the OFF ON Specify whether to star	e initialization method. t up the system without CPU "0".
	OK Cancel <u>H</u> elp

♦ Set each item and then click the [OK] button.

(2) Fail-soft operation setting

Even if some modules (modules under fail-soft operation, such as a servo module) cannot be powered on at the startup of the MICREX-SX system, the system can start up excluding such modules after the configuration check waiting time has elapsed. In this case, the system starts operation in the nonfatal fault condition.

• Click the [Fail-soft operation setting] tab in the "System properties" dialog box. The "Fail-soft operation setting" tab page opens.

ystem properties		×
System Running Definition Redund	dancy setting Fail-soft operation setting	
Fail-soft start up mode selection		
Fail-soft start up none		
C Partial Fail-soft start up	Start Station No. of fail-soft running 🛛 🚦	
C All Fail-soft start up		
	Extension setting >>	
	OK Cancel	Help

- If there is any device under system fail-soft operation, select "Partial Fail-soft start up" and then enter the SX bus station number from which fail-soft operation is to be started.
- Click the [OK] button.

(3) System redundancy definition

If a failure occurs in a working CPU module, the standby CPU operates to continue PLC system operation. This configuration is referred to as CPU redundancy.

<Overview of redundant system>

1-to-1 redundant system

1-to-1 redundant CPU system has one standby CPU for one working CPU. Each of CPU0-CPU1, CPU2-CPU3, CPU4-CPU5, and CPU6-CPU7 indicates a pair of a working CPU and a standby CPU. Therefore, when building a multi-CPU 1-to-1 redundant system, up to four pairs of CPUs can be installed. The same application program must be downloaded to a working CPU and a standby CPU.

<Example of redundant system configuration>

Generally, the working CPU and standby CPU are mounted on different base boards and other modules to be controlled by the CPU are mounted on another base board, as shown below. If the working CPU fails and the standby CPU starts operation instead, this configuration enables you to replace the failed CPU while the standby CPU is operating.



Note: It is also possible to build a redundant system with an working CPU and a standby CPU mounted on the same base board. In this case, however, the standby CPU module cannot be replaced during system operation.

<System redundancy definition>

1) Module registration

- Register modules and units that are actually mounted in the same manner as usual systems.
- ◆ Register modules according to the actual system configuration, as shown below.





2) System redundancy definition

On the "Redundancy setting" screen of the "System properties" dialog box, select ON or OFF of redundancy and set details of redundancy.

Select "System properties" on the system definition screen and then click the [Properties] button. The "System properties" dialog box appears.



Click the [Redundancy setting] tab on the "System property" dialog box. The "Redundancy setting" tab page opens. Set each item and then click the [OK] button.

System propertie Select	t redundancy ON or OFF.		X
System Bunning Definition	Redundancy setting Fail-soft	operation setting	
		Maka datail a	atting for redundancy
C Redundancy UFF			etting for redundancy.
Redundancy ON			
1:1		Memory copy range	
Working Standby	standby-mode switch	n High No	ormal Retain
CPU0 - CPU1 (C)	O Cold ⊙ Warm □	Yes 0 W(D) 100) w 200 w 1
CPU2 - CPU3 (E)	© Cold C Warm □	Yes 0 W(F) 0	W O W
🔲 CPU4 - CPU5 (G)	⊙ Cold C Warm □	Yes 0 W(I) 0	w 0 w 1
CPU6 - CPU7 (J)	🖸 Cold 🛛 🔿 Warm 🗖	Yes 0 W(K) 0	w 0 w
L			
_ N:1			
CPU0	CPU1 CPU2 CPU3 CPU4 CPU	5 CPU6 CPU7 Standby CPU	Memory module
Group1			
Working(L)		5 6 7 CPU No.(M) None	Station No.(N) None
Group2			
Working(0) 🔲 (1 🗆 2 🗖 3 🗖 4 🗖	5 🔲 6 🔲 7 CPU No.(P) 🛛 None	e ▼ Station No.(Q) None ▼
		OK	. Cancel Help

<Settings for redundancy system>

Settings for 1-to-1 redundant system are shown below. In a 1-to-1 redundant system, which CPU is paired with which one is predetermined and up to four pairs can be specified.



3-1-4 Address inversion setting

This function inverses I/O addresses and P/PE-link bit addresses (0 bit ↔ F bit) displayed in the program or data monitor window.

<Use example 1>

When a MICREX-F series I/O is connected to the SX series T-link and you want to match the bit numbers of the I/O (terminal) with those of the CPU (program).

<Use example 2>

When SX and MICREX-F series are mixed in a P/PE-link system and you want to match the bit addresses viewed from MICREX-F with those in SX.

<Setting example>

On the system definition screen, click [Edit] menu > [Bit Inversion Setting].



The "Bit Inversion Setting" dialog box opens.

When "The background of the device is inversion display." is checked, the device addresses are inversely displayed. In the following example, this option is checked.

• Example of "Bit Inversion Setting" screen of I/O

Check the modules the address of which you want to inverse.

Bit Inversion Setting		×
SX bus I/O P/PE link		
Image: State in the initial initinitial initinitial initial initial initial initial ini		
The background of the device is inversion display.	OK	キャンセル

• Example of "Bit Inversion Setting" screen of P-link

The target is high-speed 1 area. Select block Nos. that you want to inverse assuming that 1 block equals to 32 words. In the following example, the bit memory (M8.0 to M8.31F) of the block 0 (WM8.0 to WM8.31) is inversed.

Bit Inversion Setting	×
SX bus I/O P/PE link	
SX bus I/O P/PE link	High speed bit area Ø Block0 Block1 Block2 Block3 Block5 Block6 Block7 Block8 Block10 Block12 Block13 Block14
The background of the device is inversion display.	 OK キャンセル

• Example of "Bit Inversion Setting" screen of PE-link

The target is high-speed 1 area. Select block Nos. that you want to inverse assuming that 1 block equals to 8 words. In the following example, the bit memory (M9.0 to M9.7F) of the block 0 (WM9.0 to WM9.7) is inversed.

Bit Inversion Setting	×
SX bus I/O P/PE link	
COM : CPU-8 : P Link : NP1L-PL1	High speed bit area
	Block0
	Block 1
	Block2
	Block3
	Block5
	Block6
	Block 12
	Block 14
	Block 15
	Block 17
	Block 18
	Block 19
	Block 20
	Block21
	Rlock 22
▼ The background of the device is inversion display.	<u>OK</u> キャンセル

<Example of address inversion>

When address inversion setting has been made, the target I/O memories and P/PE-link memories are inversely displayed as shown below.

M 0000000 M 0000000 M 00000000 Y001. 001.000F 2 \dashv \vdash -()-Y003 0000 } ſ M008. 0000320 3 -() M009. 000032F -(}

• Example of inversion display of ladder

• Example of inversion display of data monitor

Dat	a Monitor 1				
i e 💷 🕅	X 🗙 🔍	+ + + +	~ <none></none>	- 🖬 📬 🏪	
Addre	ess	Tag	F	0 F	0
X1.	0.F				0
X1.	0.E				0
M 0					0
Y1.	1.F				0
ΥЗ.	0				0
M8.	F				0
Μ8.	320				0
М9.	F				0
м9.	32F				0

<Special notes>

The address inversion function only inverses the display of addresses on the ladder screen and data monitor screen of the loader. Note that the actual memory addresses are not inversed.

	MSB			LSB
Actual bit address	X1.0.F	X1.0.E	 X1.0.1	X1.0.0
Address inversion is not set	X1.0.F	X1.0.E	 X1.0.1	X1.0.0
Address inversion is set	X1.0.0	X1.0.1	 X1.0.E	X1.0.E

Enter actual bit addresses on the ladder screen and data monitor screen.

When you enter a contact address "X1.0.F" for which address inversion is set, "X1.0.0" must be entered actually as shown below.



3-1-5 Bus tact Time check function

This function calculates a bus tact recommendation value in the loader according to the configuration set in the system definition.

♦ On the system definition screen, click [Tool] menu > [Bus tact Time check].

	👬 System definition	
1	File Edit View Tool Help	
	Image: Base of the second se	
	Erren System strug Bus tact Time check	
1	System properties	
1	i ⊡∽∰∰ 11slots Base : NP1BS-11	
	Bower : AC Power(35W) : NP IS-22	
ł		
1	🚽 🖩 Direct I/O:SX station No1:DC Input 64points:NP1X6406-W	
1	— 🖷 Direct I/O: SX station No2 : Sink Output 64points : NP1Y64T09P1	
1	— 🖷 Direct I/O : SX station No3 : High Speed AI 8CH(Voltage) : NP1AXH8V-MR	
	🛄 📕 Direct I/O : SX station No4 : High Speed AO 8CH(Voltage) : NP1AYH8V-MR	
	Check the tact time	

◆ The check result is displayed.

Bı	us tact cycle Time	×
	Recommend bus tact Time[SX bus]:1.0ms Direct I/O points:512 points(Input:256 points,Output:256 points) CPU numbers:1 numbers I/O master numbers:0 numbers Communication module numbers:0 numbers	-
	This recommended bus tact Time, we have calculated direct I/O configuration. There is a p	>
	▲ ▲ ▲ ▲ ▲ ▲ ▲ ▲ ● ▲ ●	1

• Apply ⇒ Applies the check result to the SX bus tact of the system property.

Note: When using a periodic task, make sure that the period time must be a multiple of the bus tact.

- When using the constant scan function, make sure that the set scan time must be a multiple of the bus tact. • OK \Rightarrow Closes the check result window.
- Memo ⇒ Starts the note pad and pastes the check result in it.

3-2 System Definition of SPB Series

The following items are specified in the system definition of SPB series.



* This subsection describes the procedure of setting system definition. For more details of setting items of system definition, refer to the user's manual "Instruction (FEH202)."

3-2-1 Registering Units

(1) Unit registration

With the MICREX-SX, you need to register all the units to be used under one configuration. The following explains module registration procedures using the sample system configuration below.

<Sample system configuration>



◆ Double-click "System Definition" in the project tree. The system definition screen opens.



 Register units sequentially from the right of the basic unit in their connected order. Select the basic unit and then click the [Insert] button. The [Module insert] dialog box opens.



Select the unit (NW0AX04-MR: Analog Input 4CH) according to the actual configuration. Units' station numbers are automatically determined according to their connected order. When you select a unit and then click the [OK] button, the unit is registered.



• Register units in the same manner.

Since only one communication adapter can be connected on the left side of the basic unit in a single SPB system, its station number is fixed to "8".

Module insert			x
Unit station No.: Circuit No.:	Name: RS-232C 1CH		ок
Module attribute type	Outline specification:		Lancel
C Baseboard unit type module	Туре	Outline specification	Parameter
C Individual type module	NW0LA-RS2 NW0LA-RS4	RS-232U 1CH RS-485 1CH	Help
 Block type module 			
C Board type module			- insert position
Module group type	L		C Insert
C Basic Unit C	•	J D	 Addition
C Expansion PIO Unit	Type:		
C Expansion IO Master Unit C	NWULA-RS2		I No equipment
Communication Adaptor	Consumed current(m	Aj:	
o o	1		
0 0			



* The communication adapter is registered at the bottom of the system definition screen regardless of the registered order.

3-2-2 Basic unit parameter setting

The basic unit parameter setting includes five setting items: "CPU running definition," "Memory allocation setting," "I/O group setting," "HI Counter Definition," and "I/O Running mode".

(1) CPU running definition

Select the CPU for parameter setting on the system definition screen and then click the [Properties] button. The "Basic unit parameter" dialog box opens.

The dialog box consists of five tab pages. Click the corresponding tab to open.

The "CPU running definition" status opens first. Set all necessary items.

isic unit parameter	
CPU running definition Memory allocation setting 1/0 group setting	HI Counter Definition 1/0 Running mode
Watch Dog Timer setting © Default © Specify WDT time 4095 ms Running specification at power on Battery less run BIIN=Bury/TEBM=Burn © DEF	I/O status latch function I/O status latch function I/O status latch function Effective LED display at built-in flash memory un-match O Not display
RUN=Run/TERM=Last State O N RUN=Stop/TERM=Stop	© Display
 OFF(Not hold) ON(Hold Compulsion setting) 	
Constant scanning setting	1
ⓒ No(Scanning usually) C YES Scan time □ ms	
	OK Cancel Help

(2) Memory allocation setting

♦ When you click the "Memory allocation setting" tab, the screen opens. Set all necessary items.

CPU running definition Memory allocation setting I/O group setting HI Counter Definition I/O Running mode Range of word address Non retain memory 40 × 64W = 2560W WM000000 · WM0002557 Retain memory 10 × 64W = 1024W WL0000000 · WL0000923 User FB memory 0 × 64W = 4096W Initial data Max 1631 Default Detail of system FB memory 512 Point x 2W Edge detection 512 Point x 2W Counter 128 Point x 8W Timer 256 Point x 8W Other system FB area 512 W	Basic unit parameter
Range of word address Non retain memory 40 × 64W = 2560W WM0000000 · WM0002557 Retain memory 10 × 64W = 1024W WL0000000 · WL0000923 User FB memory 0 × 64W = 0W System FB memory 64 × 64W = 4096W Initial data Max 1631 Default Detail of system FB memory 64 × 64W = 1024 Edge detection 512 Point x 2W 1024 Counter 128 Point x 4W 512 Additional timer 0 Point x 8W 0 Timer 256 Point x 8W 0 Uther system FB area 512 W	CPU running definition Memory allocation setting 1/0 group setting HI Counter Definition 1/0 Running mode
Non retain memory 40 x 64W = 2560W WM0000000 · WM0002557 Retain memory 10 x 64W = 1024W WL0000000 · WL0000323 User FB memory 0 x 64W = 0W System FB memory 64 x 64W = 4096W Initial data Max 1631 Default Detail of system FB memory 512 Point x 2W Edge detection 512 Point x 2W Additional timer 0 Point x 8W Timer 256 Point x 8W Other system FB area 512 W	Range of word address
Retain memory Is x 64W = 1024W WL0000000 · WL0000923 User FB memory 0 x 64W = 0W System FB memory 64 x 64W = 4096W Initial data Max 1631 Default Detail of system FB memory Edge detection 512 Edge detection 512 Point x 2W 1024 W Counter 128 Point x 4W 512 W Additional timer 0 Point x 8W 0 W Timer 256 Point x 8W 2048 W Other system FB area 512 W	Non retain memory 40 x 64W = 2560W WM0000000 · WM0002557
User FB memory 0 x 64W = 0W System FB memory 64 x 64W = 4096W Initial data Max 1631 Default Detail of system FB memory Edge detection 512 Point x 2W 1024 W Counter 128 Point x 4W 512 W Additional timer 0 Point x 8W 0 W Timer 256 Point x 8W 2048 W Other system FB area 512 W	Retain memory IE x 64W = 1024W WL0000000 - WL0000923
System FB memory 64 x 64W = 4096W Initial data Max 1631 Default Detail of system FB memory Edge detection 512 Point x 2W 1024 W Edge detection 512 Point x 4W 512 W Additional timer 0 Point x 8W 0 W Timer 256 Point x 8W 2048 W Other system FB area 512 W	User FB memory 0 x 64W = 0W
Initial data Max 1631 Default Detail of system FB memory Edge detection 512 Point x 2W 1024 W Counter 128 Point x 4W 512 W Additional timer 0 Point x 8W 0 W Timer 256 Point x 8W 2048 W Other system FB area 512 W	System FB memory 64 x 64W = 4096W
Initial data Max 1631 Detail of system FB memory Edge detection 512 Point x 2W 1024 W Counter 128 Point x 4W 512 Additional timer 0 Point x 8W 0 W 0 Timer 256 Point x 8W 2048 Other system FB area 512 W 0	
Detail of system FB memory Edge detection 512 Point x 2W 1024 W Counter 128 Point x 4W 512 W Additional timer 0 Point x 8W 0 W Timer 256 Point x 8W 2048 W Other system FB area 512 W	Initial data Max 1631Default
Edge detection 512 Point x 2W 1024 W Counter 128 Point x 4W 512 W Additional timer 0 Point x 8W 0 W Timer 256 Point x 8W 2048 W Other system FB area 512 W	Detail of system FB memory
Counter 128 Point x 4W 512 W Additional timer 0 Point x 8W 0 W Timer 256 Point x 8W 2048 W Other system FB area 512 W	Edge detection 512 Point x 2W 1024 W
Additional timer 0 Point x 8W 0 W Timer 256 Point x 8W 2048 W Other system FB area 512 W	Counter 128 Point x 4W 512 W
Timer 256 Point x 8W 2048 W Other system FB area 512 W	Additional timer 0 Point x 8W 0 W
Other system FB area 512 W	Timer 256 Point x 8W 2048 W
OK Cancel Help	Other system FB area 512 W
OK Cancel Help	
	OK Cancel Help

(3) I/O group setting

When you click the "I/O group setting" tab, the following screen opens. Each unit registered in the system definition is automatically assigned to "DEFAULT" task. Set all necessary items.

Basic unit parameter			
CPU running definition Memory allocation setting 1/0 group setting HI Counter Definition 1/0 Running mode			
Level: DEFAULT	Standard setting		
I/O List:	Input select: Input for referring output value		
Basic Unit : Unit No0 : Resource : NW(Expansion Unit : Unit No2 : Ry Output *	Basic Unit : Unit No0 : Resource : NW0P4		
	Output select Detail Basic Unit : Unit No0 : Resource : NW/0P4 Expansion Unit : Unit No2 : Ry Output 16p <<(N)		
	All cancel		
	OK Cancel	Help	
(4) High-speed counter setting

When you click the "HI Counter Definition" tab, the following screen opens. Set all necessary items.

Basic unit parameter	
CPU running definition Memory allocation s	etting 1/0 group setting HI Counter Definition 1/0 Running mode
Mode	
 Single phase 	C Two phase
Single phase	
✓ Use channel 0	Scale Pulse + direction
Scale 🛛 🗙 🗖 Auto reset	,
🔽 Use channel 1	
Scale 🛛 🖈 🗖 Auto reset	
	UK Cancel Help

(5) I/O running mode

When you click the "I/O Running mode" tab, the following screen opens. Set all necessary items.

ic unit par	ame	eter																					
PU running	defir	nition	Me	emory	y allo	cation	n set	ting	1/0	grou	ip sel	tting	н	Coun	iter D	efinit	ion	1/0 R	unning	g mod	le		
- Software I	filter	settir	ig—																				
O Not	t setti	ing																					
Set	ting		Set	ting v	/alue	: 3m	IS			•													
- Bemote B	IIN/	STO	P hit	setti	na												_						
nu	F	E	D	С	В	A	9	8	7	6	5	4	3	2	1	0							
000			1		- 		-			-	-		-										
1W	F	E	D	С	В	A	9	8	7	6	5	4	3	2	1	0							
ZW	F	Ε	D	С	В	A	9	8	7	6	5	4	3	2	1	0							
3₩	F	Е	D	С	В	A	9	8	7	6	5	4	3	2	1	0							
	_																						
																ОК		1	Cano	el	1	Help	

After setting each parameter of the basic unit, click the [OK] button to complete the setting.

This section explains the functions associated with print. The print commands are as follows.

- [Page setup]: Sets a page to print a project.
- [Print]: Prints a project.
- [Print preview]: Previews to print a project.
- * 1 Install the printer driver to use the print function
- * 2 It is not possible to print "I/O device list", "Device usage", "Device Cross reference" and "Initial setting list" with this function. To print them, output a text file (csv format) by using the [Export] command in the [Project] menu, and open the file in Excel, and then print it.

4-1 Page Setup

◆ Click [File] menu > [Page Setup]. The following dialog box opens. Set paper size, orientation, margin, etc.

Page Setup	×
	Note and Note of the American Strength of the American Strengthof the American Strength of the American Strength of the American
Paper	
Size:	ter 🔽
Source: Aut	omatically Select
Orientation	Margins (inches)
Portrait	Left: 0.75 <u>Rig</u> ht: 0.75
C Landscape	<u>T</u> op: 0.75 <u>B</u> ottom: 0.75
	OK Cancel

4-2 Print

Click [File] menu > [Print]. The following dialog box opens.
 Choose a printer, print items, the range, and the number, and then click the [OK] button to start printing.

Print		X
Printer Na <u>m</u> e: Microsoft XPS Document	Writer	Property
Print Items	Page	
✓ Program	• <u>A</u> ll	
System <u>D</u> efinetion	O Page appointment	1 <u>F</u> rom
Project Tree		1 <u>T</u> oPage
🔲 Program Property		
AF <u>B</u> Ladder	Font Font <u>N</u> ame	Courier New
detai <u>l</u> s	Font <u>S</u> ize	9
Previ <u>w</u> er		OK Close

(1) Print items

Print items are as follows.

- Program
- System definition
- Project tree
- Project properties
- AFB ladder

If you click the [Detail] button, you can perform the detailed settings.

(1)-1 Program

Items checked in the "Program List" are printed.

Print Item Detail		X
Print <u>I</u> tem		
Program System Definition	Program List	
Project Tree	E Resource	All <u>S</u> et
AFB Ladder	Ladder0: (0)	All <u>R</u> eset
	Ladder 1: (1)	All Pr <u>og</u> ram Set
	Unassigned Programs Function Block	All Unassigne <u>d</u> Program Set
		All Function Block Set
	⊡	All Function Set
		Monochrome Printing
		Protect Line Breakup
		Print Line number in each section
		Include Cross Reference
		C Grid style
		In-circuit style
		Draw Input De <u>v</u> ice
		M Draw Output Device
		Address Rows 1 Row
		Tag Rows Hide
		Display Tag
		OK Cancel

• [Monochrome Printing]:

Forcibly performs monochrome printing of a program. When "black and white" is selected in the printer settings and a program is printed, X and Y addresses, which are displayed in red on the screen, are difficult to see when printed. By selecting "Monochrome Printing," the character color is forcibly changed to black to make a program easier to see when printed.

• [Protect Line Breakup]:

A line is printed on the next page to avoid printing on the current and next pages.

• [Print Line number in each section]:

If this option is unchecked, for line numbers (line number displayed to the left of each row), serial numbers starting with "0" are printed for each program, regardless of "SECTION" instructions. If this option is checked, serial numbers starting with "0" are printed for each part delimited by "SECTION" instruction.

Regardless of whether this option is checked, when there is "SECTION" instructions in a program, the program is delimited by them and each part is automatically printed on different pages.

[Include Cross Reference]:

Adds cross reference to every line and print it. Choose "Grid style" or "In-circuit style."

- [Address Rows] :
 - Select Hide or 1 to 12 Rows.

• [Tag Rows] :

Select Hide or 1 to 12 Rows. By switching between "Display Tag" and "Display Description," description can be printed instead of tags.

<Printing cross reference>

An example of printing cross reference is shown below.

• When "Grid style" is selected and "Print Line number in each section" is unchecked

MachineA	_Prir	nt		Ladder0[0]			1 Page
1	- SECTI	ON 1 —						
Device	Access	Instruction	Symbol	Туре	ES0/ES1	Program	Line No.	Device Pos
N1	Read	SECTION		Program	-	Ladder0	1	1
N1	Read	SECTION		Program	-	Ladder1	1	1
		_		_				
Device	Access	Instruction	Symbol	Туре	ES0/ES1	Program	Line No.	Device Pos
X1.0	Read	LD	- -	Function Block	-	FB0	1	1
X1.0	Read	LD	- -	Function	-	FCT0	1	1
X1.0	Read	LD	- -	Program	-	Ladder0	2	1
X1.1	Read	ANI	- / -	Program	-	Ladder0	2	3
X1.1	Read	LD	- -	Program	-	Ladder1	2	1
Y2.0	Read	OR	- -	Program	-	Ladder0	2	2
Y2.0	Write	OUT	-()-	Program	-	Ladder0	2	4
Y2.0	Read	LD	- -	Program	-	Ladder0	3	1
Y2.0	Read	LD	- -	Program	-	Ladder1	3	1

• When "Grid style" is selected and "Print Line number in each section" is checked

MachineA_Print

Ladder0[0]

1 Page

Y2.0

SECTION 1 0

- SECTION

Device	Access	Instruction	Symbol	Туре	ES0/ES1	Program	Line No.	Device Pos
N1	Read	SECTION		Program	-	Ladder0	N1:0	1
N1	Read	SECTION		Program	-	Ladder1	N1:0	1

1	X1.0	X1.1
'	Y2 0	

Device	Access	Instruction	Symbol	Туре	ES0/ES1	Program	Line No.	Device Pos
X1.0	Read	LD	- -	Function Block	-	FB0	N0:0	1
X1.0	Read	LD	- -	Function	-	FCT0	N0:0	1
X1.0	Read	LD	- -	Program	-	Ladder0	N1:1	1
X1.1	Read	ANI	- / -	Program	-	Ladder0	N1:1	3
X1.1	Read	LD	- -	Program	-	Ladder1	N1:1	1
Y2.0	Read	OR	- -	Program	-	Ladder0	N1:1	2
Y2.0	Write	OUT	-()-	Program	-	Ladder0	N1:1	4
Y2.0	Read	LD	- -	Program	-	Ladder0	N1:2	1
Y2.0	Read	LD	- -	Program	-	Ladder1	/ N1:2	1

In the example above, "N1" indicates the No. of SECTION instruction and a number after ":" indicates line No. in the SECTION. • When "In-circuit style" is selected and "Print Line number in each section" is unchecked



number in the lower row "N1" indicates the No. of SECTION instruction, and a number after ":" indicates line No. in the SECTION.

(1)-2 System definition

There is no setting item for system definition.

Print Item Detail		×
Print <u>I</u> tem		
Program System Definition Project Tree Program Property AFB Ladder	There is not the setting item.	
	OK Cancel	

(1)-3 Project tree



• Calling relationship of Functions / Function Blocks: When using FBs, the interaction between the program and FB is printed.

(1)-4 Program property

The program properties of the items whose box is checked in the "Program List" are printed. The program properties include the following information.

- Program Name
- Program No.
- Type (Kind)
- Use of enable flag (ENO)
- Local device setup information
- Parameter list (only functions and function blocks)
- Array/structure declaration
- Information on memory in function blocks (only function blocks)

Print Item Detail Program System Definition Project Tree Program Property AFB Ladder Una Program List Program Resource Program Re	a am Ladder0: (0) Ladder1: (1) Ladder2: (2) signed Programs tion Block FB0: (0) FB1: (1) tion FCT0: (0)	All Set All Reset All Program Set All Unassigned Program Set All Function Block Set All Function Set	×
			ncel

(1)-5 AFB Ladder

The items checked in the AFB ladder program list are printed.

Print Item Detail		×
Print <u>I</u> tem		
Program System Definition Project Tree Program Property AFB Ladder	Program List Resource AFB L	All <u>S</u> et All <u>R</u> eset
		Monochrome Printing
		Protect Line Breakup Print Line number in each section
		Address Rows
		Tag Rows Hide
·	I	OK Cancel

For these setting items, refer to "(1)-1 Program."

(2) Page (print range)

Choose "All" (print all pages) or "Page appointment" (specify the target range to print). When you choose "Page appointment," use the preview function to confirm the print image.

4-3 Print Preview

◆ Click [File] menu > [Print Preview]. The "Print preview" screen opens.



Icon



- [Print]: Executes printing.
- [Zoom]: Zooms in the preview screen.
- [Consolidation]: Chooses the number of screens from 1/2/3/4/6.
- [Close]: Closes the print preview screen.

4-4 Circuit Print

This function is used to print a program by specifying the print range in units of lines on the screen.

Open a program that you want to print, and drag the circuit No. part on the left side to select the lines. Then, right-click and select "Circuit Print."



• The "Print" dialog box opens. Select a printer, and then click the [OK] button. The selected lines are printed.

Print		×
Printer Na <u>m</u> e: Microsoft XPS Document Writ	ter	Property
Circuit Print C All Circuit C Selected Circuit	Page <u>A</u> II Page appointment	1 Erom
	Font Font <u>N</u> ame Font <u>S</u> ize	Arial V 8 V
Previwer		OK Close

The SX control utility allows MICREX-SX system I/O and internal memory monitoring, data change, and data backup without starting the loader. This utility can also be used for I/O check in a system where no project is downloaded to the CPU module.

Appendix 1-1 Starting SX Control Utility

- Click [Start] of Windows > [All Programs] > [SX-Programmer Standard V3] > [Tools] > [SX Control Utility].
 * Alternatively, you can click [Tools] menu > [SX Control Utility] on the loader.
- ♦ When the SX control utility is started, the following message appears.

SX Control Utility
Same Communication Port cannot be used by other applications while this application is being started.
ОК

Click the [OK] button. The dialog box to confirm reading of the system configuration appears.

SX Contro	ol Utility
2	System configuration is read.
~	System configuration information on PLC is necessary to use this application in an online mode.
	OK Cancel

◆ Click the [OK] button to read the system configuration from the connected CPU module.

SX Contro	ol Utility 🔀					
Reading the system configuration was complete						
~	Does the monitor begin?					
	Yes No					

Click the [Yes] button to display the screen and start monitoring.
 Click the [No] button to display the screen without starting monitoring.

💽 SX Control Utility						
File Data change Find Mode Display Online Tool Help						
Non retain Memory] 🛛 🖯 🗧 🖊 🖊 🖌	off Set ref cur 16 32	± + 0,0 T D	TOD DT 🖽		
🖸 😥 🛛 Monitor run	,					
CPU No. / Address	BIN	DEC(Signed)	HEX	Tin▲		
00 / M 000000	0000 0000 0000 0000	0	0000			
00 / M 0000001	0000 0000 0000 0000	0	0000			
00 / M 0000002	0000 0000 0000 0000	0	0000			
00 / M 0000003	0000 0000 0000 0000	0	0000			
00 / M 0000004	0000 0000 0000 0000	0	0000			
00 / M 0000005	0000 0000 0000 0000	0	0000			
00 / M 0000006	0000 0000 0000 0000	0	0000			
00 / M 0000007	0000 0000 0000 0000	0	0000			
00 / M 0000008	0000 0000 0000 0000	0	0000			
00 / M 0000009	0000 0000 0000 0000	0	0000			
00 / M 0000010	0000 0000 0000 0000	0	0000	•		
I I				•		
Please push F1 to display help.				NUM //		

Note 1: For a CPU module with no system definitions registered, the following message appears. The SX control utility recognizes the I/O modules of the connected system, creates system definitions, and downloads them.

SX Contro	ol Utility 🔀					
	There is no system definition.					
After the system definition is made, it download to P						
	Yes No					

◆ Click the [OK] button to create and download the system definitions to the CPU. Then, the following message appears.



- ♦ Click the [OK] button, reset the CPU, and then use the SX control utility.
- Note 2: If communications with the CPU are not established when the SX control utility is started, the following message appears. In this case, check the connections with the CPU and communication settings for the SX control utility.



Appendix 1-2 SX Control Utility Window

Select the memory type. 4) Monito	or status display Men	u Tool bu	tton
🔣 SX Control Utility			
File Data change Find Mode Displa	ay Online Tool Help	/	
Non retain Memory] 🚺 🗢 😫 🖛 🕫 📩	off s≝ s≝ cus 16 32	± + 0,0 T D TOD DT 🖽)
O 😥 Monitor stop			
CPU No. / Address	BIN	DEC(Signed)	HEX
00 / M 0000000	0000 0000 0000 0000	0	0000
00 / M 0000001	0000 0000 0000 0000	0	0000
00 / M 0000002	0000 0000 0000 0000	0	0000
00 / M 0000003	0000 0000 0000 0000	0	0000
00 / M 0000004	0000 0000 0000 0000	0	0000
007 M 0000005	0000 0000 0000 0000	0	0000
00 / M 0000006	0000 0000 0000 0000	、 0	0000
\007 M 0000007	0000 0000 0000 0000		0000
	4		
Please push F1 to display help.			
1) Mark display area	2) Address display area	3) Data	display area

1) Mark display area

- Displays the mark settings.
- When a mark is set for an address, this area shows a marker (O in light blue).
- Displays the reference input specification for output address. When an output area has been defined as the reference input in I/O group setting of the system definitions, "R" is added to the address.

2) Address display area

Displays the addresses in the CPU memory in the order of CPU numbers and addresses. If the corresponding address has not been registered to an I/O group, it is not displayed. Modules registered as "no equipment" are displayed regardless of whether the I/O group setting is made, however, the binary display area is grayed out.

3) Data display area

Binary display area

Displays binary data of the memory related to "Address display area."

<Detailed display of I/O group definition>

This area also displays detailed information of I/O group settings. Bits for which I/O groups have been set are displayed in the ordinary character display color (black) and the ones for which no I/O groups have been set are displayed in gray.

- Forcible set status display (valid only when forcible ON/OFF display is set)
- Bits set for forcible ON/OFF are displayed with an underscore (red).
- Decimal display area

Displays decimal data of the I/O module related to "Address display area."

(The data type can be selected from signed integer, unsigned integer, or real number.)

Hexadecimal display area

Displays hexadecimal data of the I/O module related to "Address display area."

Time display area

The data that corresponds to the data in the address display area is displayed in time format (selectable from "T" (ms),

"D" (year, month and day), "TOD" (hour, minute and second) and "DT" (year, month, day, hour, minute and second)). • String display area

The data that corresponds to the data in the address display area is displayed in the form of character string (STRING type).

4) Monitor status display

Displays the monitor status (stopped or running).

Appendix 1-3 SX Control Utility Operations

(1) Setting monitor ON/OFF

Start or stop monitoring.

◆ Start or stop monitoring by clicking the O [Monitor] button or D [Monitor (force having)] button.

📰 SX Control Utility				
File Data change Find Mode Display	y Online Tool Help			
In/Output Memory		off Set Set CER 16 32	± + 0,0 T D	TOD DT 🖽
O 😥 Monitor run				
CPU No. / Address	BIN	DEC(Signed)	HEX	▲
00 / Y 001.000	0000 1000 1001 0000	2192	0890	
				_
	When monitoring is a button, the bits that a underscore in the bir	started by clicking the [Mon are forcibly set ON/OFF are nary data display area.	itor (force having)] displayed with an	
				•
Please push F1 to display help.			Force	NUM ///

(2) Setting bit data

You can overwrite or forcibly set/reset (force ON/OFF) bit data in the binary data display area. Force ON/OFF is valid only for actually existent I/O memories.

😨 SX Control Utility							
File Data change Find Mode Display	y Online Tool Help						
In/Output Memory	In/Dutput Memory						
O 😥 Monitor run							
CPU No. / Address	BIN	DEC(Signed)	HEX	_			
00 / Y 001.000	0000 1000 1001 0000	2192	0890				
				_			
				×			
Please push F1 to display help.			Force	NUM			

- ♦ Select a bit to set and click one of the following buttons:
 ★ [Bits ON], ♣ [Bits OFF], ♣ [Force set], and ♣ [Force reset].
- ◆ To release the forcibly set/reset I/O, select the forcibly set bit and click the set/reset forcibly, click [Data change] menu > [Force] > [Batch release].

in s	X Control Util	ity					
File	Data change	Find	Mode	Display	Online	Tool	Hel
l In/	Force	•	Set		Ctrl+:	5	4
11ms	Data chang	je 🕨	Rese	t	Ctrl+I	R	
0	Move to PL	C	Relea	ase	Ctrl+I	D	
	CPU No.	/ Ad	Batc	n release.			IN
-	00 / Y 001.	.000		<u> </u>	1000	000	100

(3) Setting word data (16- or 32-bit data)

You can overwrite data on the word data in the decimal or hexadecimal display area on the "SX Control Utility" window.

Click the decimal or hexadecimal display area of the memory to be overwritten, set decimal or hexadecimal data in accordance with the display area, and press the <Enter> key.

🔣 SX Control Utility					
File Data change Find Mode Displa	y Online Tool	Help			
Non retain Memory			. afr s€r s€r c⊑r 16 32	± + 0,0 T D	TOD DT 🖽
O 😥 Monitor run					
CPU No. / Address	B	IN	DEC(Signed)	HEX	▲
00 / M 0000000	0000 0000	0000 0000	0	0000	
00 / M 0000001	0000 0000	0000 0000	0	0000	
00 / M 0000002	0000 0000	0000 0000	0	0000	
00 / M 0000003	0000 0000	0000 0000	0	0000	
		7	Ţ,	1*	
SX Control Utility	. Online Teel	Liele	/	/	
File Data change Filito Mode Displa-					
Non retain Memory		- 	· 야구 SĚT RĚT 6명, 16 32	± + 0,0 T D	TOD DT 🖽
O 😥 Monitor run					
CPU No. / Address BIN DEC(Signed) HEX					
00 / M 000000	0000 0011	1110 1000	1000	03E8	
00 / M 0000001	0000 0000	0000 0000	0	0000	
00 / M 0000002	0000 0000	0000 0000	Set data 0	0000	
00 / M 0000003	0000 0000	0000 0000	0	0000	

* Double-word data can also be set by switching word/double-word display by the 16 [16-bits display] and 32 [32-bits display] buttons.

(4) Batch data change

You can change the data in multiple memories in a batch. Note: Since data are set in a batch offline and then transferred to the CPU, you need to stop the CPU to use this function.

• Stop the monitoring on the SX control utility.

🔣 SX Control Utility				
File Data change Find Mode Displa	y Online Tool Help			
Non retain Memory		off Set Set CER 16 32	± + 0,0 T D	TOD DT 🕅 🎛
O D Monitor stop				
CPU No. / Address	BIN	DEC(Signed)	HEX	<u> </u>
00 / M 000000	0000 0011 1110 1000	1000	03E8	
00 / M 0000001	0000 0000 0000 0000	0	0000	
00 / M 0000002	0000 0000 0000 0000	0	0000	
00 / M 0000003	0000 0000 0000 0000	0	0000	
00 / M 0000004	0000 0000 0000 0000	0	0000	

♦ Set data.

💽 SX Control Utility				
File Data change Find Mode Displa	y Online Tool Help			
Non retain Memory	• ≋ • ■ • ■ *	off SET RET CER 16 32	± + 0,0 T D	TOD DT 🖽
O D Monitor stop				
CPU No. / Address	BIN	DEC(Signed)	HEX	▲
00 / M 0000000	0000 0011 1110 1000	1000	03E8	
00 / M 0000001	0000 0000 0000 0000	0	0000	
00 / M 0000002	0000 0000 0000 0000	0	0000	
00 / M 0000003	0000 0000 0000 0000	0	0000	
00 / M 0000004	0000 0011 1110 1000	1000	03E8	
00 / M 0000005	0000 0111 1101 0000	2000	07D0	
00 / M 0000006	0000 1011 1011 1000	3000	0888	
• ••••••••••••••••••••••••••••••••••••				

Data set in a batch

◆ Transfer the set data to the CPU. Click [Data change] menu > [Move to PLC...]. The "Move to PLC" dialog box appears.



* For a multiple-CPU configuration, select the CPU to which the data is transferred.

Select the data transfer destination CPU and click the [OK] button. The following confirmation dialog box appears. Click the [OK] button to transfer the data to the CPU.



Click the [OK] button to complete the transfer operation.

Appendix 1-4 CPU Memory Backup

The SX control utility can store backup data files (*.bup) for program memory, data memory, system definitions, etc. from the CPU into the computer.

Note: Backup files for programs and system definitions cannot be opened with the loader. Data stored in files are in SX-specific machine code.

(1) Data backup

Transfer the data in the CPU module to the computer.

- ♦ Stop the monitoring and click [Tool] menu > [BackUp]. The [Backup] dialog box opens.
- Set the transfer source CPU and the transfer destination file, and then select the backup data type from the list box.

Backup	1
Operation Transferring from backup file to the available by specifying a backup fil source and the CPU as the transference of	e CPU is also le as the transfer er destination.
Move source Move destination PLC:	
CPU No. : CPU 0 CPU No. : CPU 0 File : Browse	Click the [Browse] button to display the [Browse] dialog box and specify the transfer destination file.
Selection of move data	
Verify Program All select All select	
Image: Setting and the settin	
Retain Memory 0-8191 Ulser FB Memory 0-24575	
Execution Close	

The backup range in the data memory area can be specified. When you select a data memory, the [Range setting...] button is enabled. Click it to display the "Range setting" dialog box. On this dialog box, specify the range and click the [OK] button.

Range setting	×
Retain Memory	
Move source	
Starting word address :	0
End word address :	8191
Move destination Starting word address :	
ОК	Cancel

Select the transfer source, transfer destination, and backup data, and then click the [Execution]. The following confirmation dialog appears. Click the [OK] button to start data transfer.



When data transfer is completed, the dialog box appears, showing the transfer results.

moved result	
Detail :	
Program System definition Non retain Memory Retain Memory	:Move end :Move end :Move end :Move end
1	
	Close

(2) Data verify

You can compare the contents of the memory in the CPU with those of the backup file.

On the [Backup] dialog box, select "Verify," and then select the verification source file, verification destination CPU, and data type to be verified. Then, click the [Execution] button.

Operation Move Veril Verify source PLC : CPU No. : CPU File : C:\Documents and Se	y	Verify destination PLC : CPU No. : [File :	CPU 0 _
Verify source PLC : CPU No. : CPU File : C:\Documents and Se	0 💌	Verify destination PLC : CPU No. : [File :	CPU 0 _
PLC : CPU No. : CPU File : C:\Documents and Se	0 💌	PLC : CPU No. :	CPU 0 💌
CPU No. : CPU File : C:\Documents and Se	0	>> CPU No. : [CPU 0 _
File : C:\Documents and Se	ttings Browse	File:	
C:\Documents and Se	ttings Browse		
,			Browse.
Data type Program	Address range of so.	Top address of desti	All select
System definition		_	Ronge setting
Non retain Memory	0 - 65535	0	rrange setting.
	0.0131	U	

The following confirmation dialog box appears. Click the [OK] button to start verification.



♦ When verification is completed, the dialog box appears, showing the verification results.

Verified result		
Detail :		
Variable initialization information Task structure information System FB information System structure definition System property System output definition CPU Running Definition CPU Memory Size Definition Execution band ratio setting Direct I/O fail-soft operation setting	identical identical identical identical identical identical identical identical identical	Close

(3) Backup text file input/output function

You can save backup data as text files and display or edit the saved data with a commercially available text editor or spreadsheet program.

◆ First, read backup files that have been created with the [BackUp] command in the [Tool] menu.





◆ After selecting a backup file, click the [Open] button. The selected backup file is opened.

C:\Documents and Settings\suga	no1\My Documents\Untitled	bup - SX Control Utility		_ 🗆 🗙
File Data change Find Mode Displa	y Online Tool Help			
Non retain Memory] ○ \$∃ →≡ +≡ <mark></mark> *N	off set set de 16 32	± + 0,0 T D	TOD DT 🛛 🚥
Offline				
CPU No. / Address	BIN	DEC(Signed)	HEX	_
00 / M 000000	0000 0011 1110 1000	1000	03E8	
00 / M 0000001	0000 0000 0000 0000	0	0000	
00 / M 0000002	0000 0000 0000 0000	0	0000	
00 / M 0000003	0000 0000 0000 0000	0	0000	
00 / M 0000004	0000 0000 0000 0000	0	0000	
00 / M 0000005	0000 0000 0000 0000	0	0000	
00 / M 0000006	0000 0000 0000 0000	0	0000	
00 / M 0000007	0000 0000 0000 0000	0	0000	-
			· · · · · · · · · · · · · · · · · · ·	F
Please push F1 to display help.				NUM ///

Then, click [File] menu > [Save as...]. The following dialog box opens. Check "Save the memory area data by the text form," enter a file name for the file to be saved, and then click the [Save] button. The backup data is saved in the file, in the "tab delimited text" format.

āave as		? ×
Save in: [My Documents 💽 🗲 🕻	1 🕂 🛅 🛨
My Music My Picture: prog1 Projec_112 Projec_112 Project01	Project02 Final Sample01 Controlled Untitled.bup 7	
File name:	bupup_data	Save
Save as type:	Backup file (*.bup)	Cancel
🔽 Save the i	nemory area data by the text form.	

<Saved file name and folder>

By the operations explained above, a folder and a file are created in the following structure.



<Format of created text file>

The created text file is delimited by tabs in the following format.

* The figure shown below is an example when a file is opened with a text editor.

MTER_	1 - Notepad							
File Edit	Format View Help							
Address	BIN DEC(INT) DEC	C(UINT)	DEC(D	INT)	DEC(U	DINT)	HEX(WORD)	HEX(DWORE 🔺
000000	0000001111101000	1000	1000	1000	1000	03E8	000003E8	T#1s D#' 🚽
000001	0000000000000000	0	0			0000		
000002	000000000000000000000000000000000000000	0	0	0	0	0000	0000000	T#000ms D#'
000003	000000000000000000000000000000000000000	0	0			0000		
000004	0000000000000000	0	0	0	0	0000	0000000	T#000ms D#'
000005	000000000000000000000000000000000000000	0	0			0000		
000006	0000000000000000	0	0	0	0	0000	00000000	T#000ms D#'
000007	0000000000000000	0	0			0000		
000008	000000000000000000000000000000000000000	0	0	0	0	0000	0000000	T#000ms D#'
000009	000000000000000000000000000000000000000	0	0			0000		
000010	0000000000000000	0	0	0	0	0000	0000000	T#000ms D#'
000011	000000000000000000000000000000000000000	0	0			0000		-
•								• //

The system software utility is used to change the mode of supported programming language to "SX-mode" that conforms to IEC 61131-3, an international standard, or to update the SPB firmware.

(SPB is set to "N-mode" at shipment.)

<u>* The Board controller (SPB) is fixed to "SX-mode" and does not support "N-mode." Therefore, the system software utility is not required.</u>

<Necessary system configuration>



*For loader cable, either NN-CNV1 or NN-CNV3 can be used.

<Operating procedure>

Click [Start] of Windows > [All Programs] > [SX-Programmer Standard V3] > [Tools] > [System Software Utility] to start the system software utility.

System 9	Software Utility 🔀
	Please do not do other program executions while using this utility.
<u></u>	Moreover, please end everything when there is an executed program. (The screen saver, the virus software, other tasks or all the applications executed on the back ground end, too.)
	Are you ready ?
	Yes No

Note: Be sure to end other application programs before this utility is executed.

Close other application programs, and then click the [OK] button. The currently connected SPB is checked, and then the following dialog box appears. (This checking takes approximately 18 seconds at the maximum.)



Click the [System software Update Execution] button. The following confirmation dialog box appears.
 When an application program exists in the SPB, make a backup copy of it as needed.



Click the [Yes [Y]] button to start the update of the system software.

System software update		
System software update preparation:	Completion	
0%		100%
System software update	Executing	
0%		100%
System software collation:		
0%		100%
Elapsed time:	29s	

- Note: Be careful not to turn off the power switch of the system or disconnect the power cable while system software is being updated.
- When the update is completed successfully, the following dialog box appears. Click the [OK] button to finish the operation.

System	software update completion
(i)	Normal termination
	Please reenter the power supply of SPB, and confirm the thing that the state of the system software is updated.
	After turning on the power supply, SPB occasionally detects heavy/the light breakdown. Please execute resource initialization or all clear memories with the programming loader corresponding to each mode.

* If the update does not finish successfully, change the setting of the baud rate and re-execute the update.



Appendix 3-1 Specifications of Simulation Function

The simulation has the following functions:

- Monitoring function in the ladder screen *
- Monitoring and data setting functions in data display/setting dialog *
- Simulation panel function
- Auto feedback function
- * Operation and display specifications are the same as those of the online monitor.

Appendix 3-1-1 Screen configuration at simulation

In the following example, the ladder screen and the simulation panel are displayed for simulation.

Lad	der0											•	×
,	X1.0	TO										Y2.0	^
-	Start I	inish										Operatio	
	¥2.0					Ladder	screen						E
	Operatio												
2	Y2.0									TON	6836ms	= 10000ms}	
-	Operatio									101	Finish	100000	
*								🕑 When t	he F1 key is	pushed, th	e guidance is	displayed.	~
<)	
Pan	el0											-	×
Draw	- 🗟 A) 🖬 🔳	0 12 -	101								
													^
			_				Γ	Simulatio	n panel				=
	Start	I			6836		L			1			
	X1.0	`	¥20		10000								
Pan i Draw	vel0 ▼ 🗟 A Start X1.0) ab 💷	0 121 -	6836 10000 T0		[Simulatio	n panel]			

* On the simulation panel, you can arrange push buttons for simulation and graphical objects for data setting/display to make simulation operation easier.

Specification and function	Description			
Simulation target	User program registered to tasks * User functions and user function blocks need to be used by the user program.			
Restrictions on instructions	 Below FBs have some restrictions. M_OPEN, M_SEND, M_RECEIVE, R_READ, R_WRITE, F_READ, F_WRITE For more details, refer to "Appendix3-1-3 Details of instruction operation restrictions. As for expansion FBs provided by Fuji Electric, simulation cannot be performed normally. 			
Operation at FB monitoring	The path currently being used is displayed during monitoring of FBs currently being called (used) by multiple locations.			
Simulation panel	Graphic objects are arranged in the Simulation tab page, allowing easy simulation operation. Graphic objects which can be arranged include "label", "button", "switch", "lamp", For more details, refer to "Appendix 3-2-2 Using simulation panel."			
Auto feedback screen	Allows creation of a circuit for automatic response to the AFB (auto feedback) tab page. Only one AFB tab can be used for on project. For more details, refer to "Appendix 3-2-3 Using auto feedback (AFB)."			

Appendix 3-1-2 Specifications of simulation function

Note 1: This simulation function is used to check program logic operations. It does not allow process simulation of the entire system.

- Note 2: The accuracy of the timer is not ensured.
- Note 3: About the simulation panel and AFB screen

(a) A simulation panel can be used by online connection with PLC actual device. However, it has to follow the actual device operation on I/O address (X, Y).

- (b) AFB program is only valid during simulating. When programs are transferred to PLC actual device, AFB program is not transferred.
- Note 4: Even if simulation is stopped, contents of all memories are hold. If you want to clear them, stop simulation and then click [Clear] button to clear.

Appendix 3-1-3 Details of instruction operation restrictions

Since the Standard loader performs the simulation function in the offline mode, operations are restricted with respect to communication-related FBs requiring a remote site to communicate with.

(1) M_OPEN, M_SEND, M_RECEIVE, R_READ, R_WRITE

When these FBs are executed, only parameter check is performed. If the parameters have no error, they work properly. (The completion bit of the FB is set ON.) No data is transferred.

Appendix 3-2 Simulation Procedure

Appendix 3-2-1 Basic simulation procedure

This subsection describes how to simulate a created program.

◆ Click [Online] menu > [Simulation Mode]. "SX Simulator" starts up.

SIM S	SX Simu	lator			×
	Slot 0	Slot 1	Slot 2	Slot 3	

• Click [Slot 0]. The "Select CPU Module" dialog box opens. Choose a CPU module to use, and click the [OK] button.

Select CPU Module	×
CPU <u>M</u> odules	
NP1PM-48E 🔽 🔽	OK
	Cancel

◆ The CPU is assigned to the simulator.



 Click [Online] menu > [PLC Operation]. The following dialog box opens. Transfer programs to the PLC. (The operation is same as online.)



Note 1: In the simulation mode, the retain memory area and FB/SFB memory area are cleared when a program is transferred even if these options are unchecked.

• Click [Online] menu > [Monitor]. The program window is placed into a monitoring state.

Ladder0			-	×
			M0	
MO MO			Self_Hol	-
Self_Hol MO	TON	Oms	<u>s Oms</u> D M 10	1
Self_Hol		Finish	Timer PV	;

Appendix 3-2-2 Using simulation panel

Use the simulation panel to make simulation easier.



(1) Objects which can be used in the simulation panel

Ten different objects can be arranged at any position in the simulation panel.



1) Label

This button is used to create characters. You can specify the character font, size, and color.

<Label setting dialog box>

Main setting items on the label dialog box are shown below.



2) Line

This button is used to create lines. You can specify the color and width.

<Line setting dialog box>

Main setting items on the line dialog box are shown below.



3)Rectangle

This button is used to create rectangles. You can specify the color and width.

<Rectangle setting dialog box>

Main setting items on the rectangle dialog box are shown below.

Properties			
2↓ □		1	
🗆 Appearance		C.n.e	oifu color incido fro
BackColor	Window	Spe	city color inside tra
BackgroundImage	🔲 (none)	Spa	oifu frama galar
BackgroundImageLa	a None	Spe	city frame color.
BorderColor	Black	r	
BorderWidth	1	– Spe	ecify frame width.
🗆 Design			
Name	Rectangle1		
🗆 Layout			
	591, 112		
표 Size	40.40		
Name Indicates the name us object.	ed in code to identify th		
	Close		

4) Ellipse

This button is used to create ellipses. You can specify the color and width.

<Ellipse setting dialog box>

Main setting items on the ellipse dialog box are shown below.



5) Button

This button is used to create a button which turns on when clicked.

You can specify a bit device (mandatory) to be assigned to the button, button name, button operation (momentary or alternate).

<Button setting dialog box>

Main setting items on the button setting dialog box are shown below.

;	Properties	
	3∎ 2↓ 📼	
E	Appearance	
	BackgroundImage BackgroundImagel ButtonOperation	a None Momentary
	Display ⊡ Font	Address MS UI Gothic, 9pt
	ForeColor Text	ControlText Start
E	🗄 Data	
	Address	X1.0
E	Design	U Detter 1
F	Name E Lavout	Buttoni
	AddressPosition	cpBelow
	± Location ∃ Size	38, 98 71, 22
I c	Name Indicates the name u object.	sed in code to identify the
		Close

6) Switch

This button is used to create a slide switch which turns on when clicked and off when clicked again. You can specify a bit device (mandatory) to be assigned to the button, switch size, button type (horizontal slide or vertical slide), and button name.

<Switch setting dialog box>

Main setting items on the switch setting dialog box are shown below.



7) Indicator

This button is used to create a Indicator which displays the ON/OFF status of the specified bit device. You can specify a bit device (mandatory) to be assigned to the Indicator, color when ON.

<Indicator setting dialog box>

Main setting items on the Indicator setting dialog box are shown below.



8) Edit

This button is used to show / enter data for specific device in word or double-word. You can specify device address and data type (mandatory).

<Edit setting dialog box>

Main setting items on the edit setting dialog box are shown below.



9) Slider

This button is used to set data to specific device in word or double-word.

You can specify device address, data type (mandatory), minimum value, maximum value, and color.

<Slider setting dialog box>

Main setting items on the slider setting dialog are shown below.



10) Timer/Counter

This button is used to create a display box which displays the setting and current value of a specified timer or counter. In addition to settings of the timer/counter to be displayed (mandatory), you can specify the display color at the time of time-up (count-up). The display box has two rows and the setting is displayed in the lower row and the current value in the upper one.

<Timer/counter setting dialog box>

Main setting items on the timer/counter setting dialog box are shown below.

Properties	\mathbf{X}	
2↓ 🖻		
Appearance		Specify color of the box at time-up/count-up.
Display	Address	
OnColor	Red Red	Specify address of the timer/counter (mandatory).
🗆 Data		
Address	то	Specify task (Default/ Fixed/ Event)
Instance	CONFIGURATION: RES	using the assigned timer/counter (mandatory).
PouName	Ladder0	
Value	0	Specify program using the assigned timer/counter (mandato
🗆 Design		
Name	TimerCounter1	
🗆 Layout		
AddressPosition	cpBelow	
	257, 97	
⊞ Size	76, 42	
Name Indicates the name u object.	sed in code to identify the	
(2) How to create the simulation panel

The following describes how to create a button, indicator, and timer display in the simulation panel as shown below.



◆ Right-click "Simulation" in the project view window, and click [Insert] > [Insert Simulation Panel].



◆ The following dialog box opens. Click the [OK] button.

Insert Si	mulation Panel	×
<u>N</u> ame:	PanelO	
	OK Cancel	

Simulation panel opens.



Create a button first. Click the [Button] button, move the mouse pointer to the simulation panel and left-click it. The button is arranged as shown below.

Panel0*					
🕴 Draw 👻 📘	A 🔨		121	101 100	
		/			
	/				
Butto	<u>m1</u>				

Double-click the arranged button, and properties of the button are displayed. Enter the address of the button and the characters displayed on the button, and then click the [Close] button.



◆ The button setting is now complete.

Draw 🗕 📘	A `	ab 🔳	() 12 -	- 101 100	
St	art '				
X1	.0				

To change the size of a button, drag the "Handle" (the square dots) around the button. (Lamp, Timer/Counter etc. can be changed in the same manner.)

Start	
X1.0	

Then, create a Indicator. Click the [Indicator] button, and move the mouse pointer to the simulation panel, and left-click it. The indicator is arranged as shown below.

Panel0*		
Draw 🗸 📐 A 🔨	🗆 O 💩 🔳 🥥 12 🚽	H 101
	/	
Start	~~	
×1.0		

Double-click the arranged indicator, and properties of the indicator are displayed. Enter the address of the indicator, and click the [Close] button.

Properties	×	
₿ ≣ 2 ↓ 🖻		
Appearance		
Display	Address	
OnColor	Red	
🗆 Data		Enter addres
Address	Y2.0	
Value	0	
🗆 Design		
Name	Indicator1	
🗆 Layout		
AddressPosition	cpBelow	
	160, 40	
⊞ Size	40, 40	
Address The address associa	ted with the control.	
	Close	

The indicator setting is now complete.

Panel0*			
Draw 👻 📐 🗛		12	
Start			
X1.0			
	Y2,0		

Create a timer next. Click the [Timer/Counter] button, move the mouse pointer to the simulation panel and left-click it. The timer is arranged as shown below.

Panel0*			
🗄 Draw 👻 📐 🗛	\	121 🔛	
Start			
X1.0		0	
	Y2.0		

Double-click the arranged timer, and properties of the timer are displayed. Enter the address of the timer, and click the [Close] button.



◆ The timer setting is now complete.

Panel0*				
Draw 👻 📐	$A \setminus \Box$	0 🕹 🔳	9 121	101
Start				- 0j
X1.0				
		Y2.0	Т	no

(3) Simulation operation program

The following simple circuit was created for simulation operation check.

Ladder0*				→ ×
X1.0				Y2.0
Start F	a t hish			Operatio
Y2.0				
72.0		TON	то	10000ms-
Operatio		101	Finish	TOCOCOMS

(4) Simulation operation check

After you create the simulation panel and simulation program, perform simulation.

Following the procedure described in Appendix 3-2-1, start the simulator, transfer the program, and perform monitoring.



• When you click the "Start" button, the indicator goes on (in red) allowing the timer current value to be monitored.



Appendix 3-2-3 Using auto feedback (AFB)

The auto feedback function is used to automate simulation of the created program.

For example, to perform simulation of communications with external devices, when the signal or program turns ON and the program created in auto feedback outputs a value to a desired device, simulation can be automated for improved efficiency.

(1) Creating an auto feedback circuit

Create an auto feedback circuit that receives the value of a desired device (except local devices) of the program under simulation, performs calculation, and returns a value to the simulation program.

◆ Right-click the "Simulation" in the project view window. Click [Insert] > [Insert AFB].



• The following dialog box opens. Click the [OK] button.

Insert AFB	
Program Number: 0 Name: AFB0	Language
Comment	
Changing line is 'Ctrl + Enter' Update: -/-/::	OK Cancel

◆ The AFB screen opens.

You can edit the AFB screen is the manner as the general program edit screen.

1.1

♦ Here, create the following circuit that receives a signal from "simulation operation program" in Appendix 3-2-2 (3), starts the timer, then returns the bit signal.



<Operation>

When this circuit receives the ON signal (M0 turns on for one scan) from the simulation operation program, the re-triggerable timer (T0) is activated. The re-triggerable timer is a timer that captures a rising edge of the input signal and turns ON the timer output bit for specified time interval. With this circuit, when the specified time interval has elapsed, the timer output turns OFF and then M2 (feedback signal to the simulation program) turns ON only for one scan.

(2) Changing the simulation program

Change the "simulation operation program" in Appendix 3-2-2 (3) so that the program exchanges signals with the auto feedback circuit.



<Changes>

- 1) Add contact M2 so that the on-delay timer (T0) starts when the feedback signal (M2 turns ON for one scan) is received from the auto feedback circuit.
- 2) Add a line which transfers the count-up signal of timer T0 to the auto feedback circuit. Since on-delay timer T0 is a local device and therefore cannot be transferred to the auto feedback line as it is (T0), T0 is output to M1 and M1 is transferred to the auto feedback circuit.

(3) Checking auto feedback operation

After preparing the circuits (1) and (2) and a simulation panel by following Appendix 3-2-2 (2), execute the following procedure to perform simulation.

- 1) Start up simulation mode.
- 2) Transfer and reset programs.
- 3) Start up monitor.

Click the button [X1.0] on the simulation panel once.

The on-delay timer (T0) of the program for the simulation and the re-triggerable timer (T0) of the auto feedback circuit operate in alternate.

Array can handle multiple word data (or bit data, or double-word data) as one data block. Structure can handle combination of bit, word, double-word as one data block. To use Array/ Structure, you need to define Array/ Structure. For more details, refer to Appendix 4-2. Then, declare Array/ Structure. For more details, refer to Appendix 4-3.

Appendix 4-1 Specification of Arrays/Structures

Item		Specification
Nesting de	epth	1 level (array of arrays, array of structures)
	Max. No. of definitions	512 (User program: 256, Expansion FB provided by Fuji: 256) (Note 1)
	Max. No. of elements	32767 (16384 for 32 bit data type)
	Element No. specification	1 to specified No. of elements No. of elements: max. 32767 (16384 for 32 bit data type) * When element No. specification exceeds the range, upper limit or lower limit data is accessed.
Array	Max. No. of declarations	583 (Note 1) * "Declaration" means assigning a defined array to an address.
	Data type	Bit, word, double word, array (defined by user)
	Array name	ARY_n n : array definition No. (from 0 (decimal))
	Available memories (Note 2)	Entire program: I/O memory (W, Y), standard memory (M), retain memory (L)
		Inside of user FB: I/O memory (X, Y), standard memory (M), retain memory (L), memory for user FB (F), parameter (V), (I/O parameter only)
	Max. No. of definitions	512 (User program: 256, Expansion FB provided by Fuji: 256) (Note 1)
	Max. No. of members	255
	Data type of member	Bit, word, double word, array (defined by user)
	Structure name	STR_n n : structure definition No. (from 0 (decimal))
Structure	Member name specification	Member name indicating sign + member definition No. (from 1) * The member name definition No. is automatically assigned when the structure is defined. Member name identifying sign: R (bit), WR (word), DR (Double word), ARY_n (Array)
	Max. No. of declarations	584 (When No. of members: 1 and No. of structure definitions: 1) (Note 1) * "Declaration" means assigning a defined structure to an address.
	Available memories	Entire program: I/O memory (W, Y), standard memory (M), retain memory (L)
	(Note 2)	Inside of user FB: I/O memory (X, Y), standard memory (M), retain memory (L), Memory for user FB (F), parameter (V), (I/O parameter only)

Note 1: Definitions and declarations of arrays and structures are stored in the program memory of the CPU. The amount of program memory used by arrays and structures is obtained by the following equation.

[Equation]

(Program memory used by arrays and structures)

- = 4 + (No. of array definitions) x 5 + (Structure 0 No. of steps of definition) + + (Structure n No. of steps of definition)
- + (No. of declarations of arrays and structures) x 7
- * No. of steps of structure definition = (No. of members) + 3 (steps)

[Sample calculation]

Supposing,

- No. of array definitions: 3,
- Structure 0 (No. of members: 10)
- Structure 1 (No. of members: 5)
- No. of declarations of arrays and structures: 5

then

(Program memory used by arrays and structures) = $4 + (3 \times 5) + (10 + 3) + (5 + 3) + (5 \times 7) = 75$ steps

Note 2: The system memory (SM), timer (T), counter (C), integrating timer (TR) and step control (SC) are not available.

Note 3: Information about definitions and declarations of arrays and structures is stored in the last user function No. which the CPU can obtain (SPH300: No. 511) and then in the program memory of the CPU. Therefore, when using arrays and structures, the last user function No. (SPH300: No. 511) cannot be used.

Appendix 4-2 Definition of Arrays/ Structures

Right-click "Arrays/Struct" in the project view, and then click [Open]. The "Arrays/Structures" view and the "Array/Structure declares" list are displayed.



Appendix 4-2-1 Array definition

◆ Right-click the array in the "Array/Structures" view, and click [Add array definition].

Arrays/Structures	ų×
🗁 array	
Add array definition	

• The following dialog box opens. Set the number of array elements and data type, and then click the [OK] button.



- * When you set array of arrays, choose the defined array from the data type.
- An array is defined.



Appendix 4-2-2 Structure definition

Right-click the structures in the "Array/Structures" view, and click [Add structure definition].



• The following dialog box opens. Choose the data type of the first element of the structures, and click the [OK] button.

Add new structure definition.			
<u>Number:</u> 0 Member of structure			
<u>D</u> ata type:	BOOL		
ОК	Cancel		

◆ The structure (STR_0) and the first element (R1) are defined.



• Define the second element of the structure. Right-click the first element, and click [Insert member of structure].



The following dialog box opens. Choose the data type of the second element of the structure, and click [OK].

Insert member of str	ucture definit 🚺
<u>N</u> umber: 0 ←Member of structure	
<u>D</u> ata type:	WORD 💌
ОК	Cancel

The second element (WR2) is defined.



♦ Define the third and later elements in the same manner.

Appendix 4-3 Array/Structure Declaration

Assignment of a defined array or structure to an actual address is called "declaration." Execute array/structure declaration on the "Array/Structure declares" list.

Enter the top address on the "Array/Structure declares" list. And then, choose the defined array/structure from the "Array/ Structure" list. When moving the mouse to another row, the range of the address is calculated and displayed automatically.

Array/Structure declares				
	Start address 🛛 🔺	Array/Structure		Address range
	WM100	ARY_0	*	WM100 · WM109
	WM200	STR_0	4	WM200 - WM201
▶*			*	

* Setting of the top address:

When setting arrays of double-word and structures, set the top address as even number. When setting arrays of bit, set the top address as 0 bit.

Appendix 4-4 Array/Structure Expression on Programs

On application programs, arrays and structures are represented as shown below.



Appendix 4-5 Importing Array/Structure Definition

Import the array/structure definition in another project. If there is the definition that has the same name as the one to import, the definition is automatically imported under a different name.

 Click [Project] menu > [Import] > [Arrays/Structure]. The following dialog box opens. Click the [Select file] button, and select the file to import.

mport defines of Array/Structure	
Project file name:	Select file
Select import defines.	
	Select All
	Deselect All
C C C C C C C C C C C C C C C C C C C	Cancel



Array/Structur	e definitions im	port		? 🛛
Look <u>i</u> n:	🚞 PLC_Program		💌 🗿 🤌 🔛	•
My Recent Documents Desktop My Documents	Ladder Ladder RasMsg Sampling_Settin SysDef Tag Tag_Prj Example1.zpj3 Example2.zpj3 Example3.zpj3 Loadernet_01.z Loadernet_02.z Manual_Introdu Manual_Print.zp	ng_File j3 2pj3 2pj3 uction.zpj3 oj3	 © Online_32.zpj3 © Online_48E.zpj3 © Redundancy_74.zpj3 © Sampling48E.zpj3 © Simulation_AFB_jp.zpj3 回 サンフ ツンクドレース用74_jp.zpj3 図 サンフ ツンクドレース用_jp.zpj3 	
§	File <u>n</u> ame:	Array_Exm1.zp	pj3 ♥	<u>O</u> pen
My Network	Files of type:	Project Files (*	5.zpj3)	Cancel

• The array/structure declaration is listed. Check the items to import and click the [OK] button.



♦ When the import is completed, the following message appears.



Appendix 4-6 Array/Structure Number

A number is assigned to Arrays/Structures.



Array/Structure numbers are classified as shown in the table below to avoid overlap between numbers used in "user program" and numbers used in "expansion FB" provided by Fuji.

Item	User program	Expansion FB
Array/structure No. that can be defined	0 to 255	256 to 511
Array/structure No. that can be used for declaration	0 to 511	0 to 511
Array No. that can be specified for data type of array	0 to 511	0 to 511
Array No. that can be specified for data type of structure member	0 to 511	0 to 511

* Users can change definition numbers or delete definitions of expansion FBs.

To change Array/Structure numbers, right-click an array or a structure in the "Arrays/Structures" view.



<Overview>

There are two types of passwords. You can choose to use either one of them. Password target is PLC. Set a password while the loader is connected to the PLC.

1) Standard password

If the standard password is set, the following operations are disabled: reading of a program from the PLC, loading of a program to the PLC, PLC program change, and PLC program verification.

2) 3-level access restriction

Depending on the access level set by the user, PLC operations (Start/Stop, Load program, Read program, Change program, etc.) are restricted. The 3-level access restriction function is supported by SPH300, SPB, and Board controller [SPB]. To set this function, you need to stop the PLC.

The password for user ROM is also available. For more details, refer to 2-7-1.

◆ Click [Online] > [PLC operation]. The following dialog box opens. Click the [Password] button to open "Password" dialog box.



Authentication: If a password is set to the PLC, click this button to perform authentication by the password. Registration/Change: This button is used to set a new password, or change the set password. Clear: This button is used to delete the set password.

Restriction Setting: This button is used to make detailed settings for 3-level access restriction function.

The key icon color shown on the "Password" dialog box indicates the password status.



Gray: Password is not registered.



Orange: Password is registered, and password is not authenticated.



Green: Password is registered, and password is authenticated.

Appendix 5-1 Standard password

Appendix 5-1-1 Registering password

Click the [Registration/Change] button. The "Registration/Change" dialog box opens. Enter a password and click the [OK] button.

Password	
The password is not registered.	
Authentication Registration/Change Dear RestrictionSetting Close	
$\overline{\Box}$	
Registration/Change	
Password	
Password:	
Password confirmation:	
* Input password with 6-32 characters.	
OK Cancel	

- * Set the password from 6 to 32 alphanumeric characters and symbols (+, -, =, /). Uncheck "Access level effective." If this option is checked, the 3-level access restriction function is enabled.
- The password is registered.



At this moment, the password is authenticated, and program change or other operations are enabled. Once you close the project window, authentication is reset, and program change or other operations are disabled. To perform these operations, you need to enter the password.

Appendix 5-1-2 Password authentication

Password authentication procedure differs depending on whether the project file is opened or not.

(1) When the project file is closed

Click [Online] menu > [PLC operation]. The following dialog box opens. Click the [Password] button to open the "Password" dialog box.

Resource(CPU0)	
Ru	n
	<u>F</u> ailure diagnosis
TERM	
Load from PLC	Destination CPU0 💌
<u>R</u> esource Initialization	<network invalid=""></network>
Password	Close

• The key icon is shown in orange because the password is registered and not authenticated. Click the [Authentication] button.

Password		×
P	The password is registered.	
	Authentication Close	

• The "Authentication" dialog box appears. Enter the password and click the [OK] button.

Authentication	×
Password:	

* Input password with 6-32 characters.	
OK Cancel	

◆ If the password is correct, the password is authenticated, and the key icon changes to green. Click the [Close] button.

Password	×
The password is registered.	
Authentication	

(2) When the project file is opened

Click [Online] menu > [PLC operation]. The following dialog box opens. Click the [Password] button to open the "Password" dialog box.



• The key icon is shown in orange because the password is registered and not authenticated. Click the [Authentication] button.

Password		
The password i	is registered.	
<u>Authentication</u>		<u>C</u> lear
	RestrictionSetting	Close

◆ The "Authentication" dialog appears. Enter the password and click the [OK] button.

Password: ****** * Input password with 6-32 characters.	thentication	
* Input password with 6-32 characters.	Password:	
* Input password with 6-32 characters.	^^^^	

♦ If the password is correct, the password is authenticated, and the key icon changes to green. Click the [Close] button.



Appendix 5-1-3 Changing password

Before the password is changed, password authentication (refer to Appendix 5-1-2) is necessary. The procedure differs depending on whether the project file is opened or not.

(1) When the project file is closed

• Click [Online] menu > [PLC operation]. The following dialog box opens. Click the [Load from PLC] button to read the program.

Resource(CPU0)	\mathbf{X}
Ru	ın
	<u>F</u> ailure diagnosis
TERM	
Load from PLC	Destination CPU0 💌
<u>R</u> esource Initialization	<network invalid=""></network>
Password	Close

After reading the program, click [Online] menu > [PLC operation]. The following dialog box opens. After this, the procedure is same as "When project file is opened."

Resource(CPU0)	\mathbf{X}	
Run		
	Eailure diagnosis	
TERM		
<u>Batch operation</u>	O Individual operation	
Stop	I <u>n</u> itial run	
Run	Reset	
Load to PLC	Load from PLC	
Verify with PLC	Clear	
User ROM	Password	
C <u>a</u> lendar	Redundancy control	
Close		

(2) When the project file is opened

Click [Online] menu > [PLC operation]. The following dialog box opens. Click the [Password] button to open the "Password" dialog box.

Resource(CPU0)	×	
Run		
	Eailure diagnosis	
TERM		
• Batch operation	O Individual operation	
Stop	I <u>n</u> itial run	
Run	Reset	
Load to PLC	Load from PLC	
Verify with PLC	Clear	
User ROM	Password	
C <u>a</u> lendar	Redundancy control	
Close		

◆ The "Password" dialog box appears. Click the [Registration/Change] button.

Password		
The password is re	egistered.	
Authentication	egistration/Change	<u>C</u> lear
	R <u>e</u> strictionSetting	Close

• The "Registration/Change" dialog box appears. Enter a new password and click the [OK] button.



The new password is registered.



Appendix 5-1-4 Clearing password

Before the password is cleared, password authentication (refer to Appendix 5-1-2) is necessary. The procedure differs depending on whether the project file is opened or not.

(1) When project file is closed.

• Click [Online] menu > [PLC operation]. The following dialog box opens. Click the [Load from PLC] button to read the program.

Resource(CPU0)	
Ru	in
	<u>F</u> ailure diagnosis
TERM	
Load from PLC	Destination CPU0 💌
<u>Resource Initialization</u>	<network invalid=""></network>
Password	Close

After reading the program, click [Online] menu > [PLC operation]. The following dialog box opens. After this, the procedure is same as "When the project file is opened."

Resource(CPU0)	
Ru	IN
	Eailure diagnosis
TERM	
• Batch operation	O Individual operation
Stop	I <u>n</u> itial run
<u>R</u> un	Reset
Load to PLC	Load from PLC
Verify with PLC	Clear
User ROM	Password
C <u>a</u> lendar	Redundancy control
Close	

(2) When project file is opened.

Click [Online] menu > [PLC operation]. The following dialog box opens. Click the [Password] button to open the "Password" dialog box.

Resource(CPU0)		
Run		
	Eailure diagnosis	
TERM		
• Batch operation	O Individual operation	
Stop	Initial run	
Run	Reset	
Loa <u>d</u> to PLC	Load from PLC	
Verify with PLC	Clear	
User ROM	Password	
C <u>a</u> lendar	Redundancy control	
Close		

◆ The "Password" dialog box opens. Click the [Clear] button.

Password	\mathbf{X}
The password is registered.	
Authentication <u>R</u> egistration/Change	<u>C</u> lear
RestrictionSetting	Close

◆ The following confirmation dialog box appears. Click the [Yes] button.



◆ The password is cleared, and the key icon changes to gray. Click the [Close] button.

Password	Barasa asarasa kanasa kana	
The password	is not registered.	
Authentication	<u>R</u> egistration/Change	<u>C</u> lear
	RestrictionSetting	Close

Appendix 5-2 3-level Access Restriction Function

Appendix 5-2-1 Overview

The 3-level access restriction function restricts operations to the PLC at 3 different levels by setting passwords for access authentication. Users can change the range of access restrictions.



<Differences between standard password and this function>

The standard password function aims to maintain confidentiality and avoid falsification of projects.

It contains online access restriction function, however, it only protects projects on the loader; the PLC itself cannot be protected. In addition, only one password can be set, therefore, it is not possible to set multiple access levels.

Appendix 5-2-2 Specifications of 3-level Access Restriction Function

(1) Target CPU

The 3-level access restriction function is supported by SPH300, SPB and Board Controller [SPB].

(2) Operating range for each access level

Available operations of Standard loader for each level (default) are shown below. Note: For access restrictions that are not on the list below, use the standard password function.

Function		Level 3	Level 2	Level 1
	Program	~	~	х
Load	System definition / module driver	~	х	х
	Data / ZIP file / parameter data	~	~	х
Download changes to F	PLC	~	~	х
	Loading of project	~	~	х
	Write-protection	~	~	х
User ROM	Export of user ROM file to text file	~	~	х
	Writing of tag project	~	~	х
	Import of tag project	~	~	х
Monitor	~	~	~	~
Data modify		~	~	х
PLC information		~	~	~
Task execution time measurement		~	х	х
Memory clear	Program	~	х	х
(Note)	System definition / data / ZIP file / resource initialization	~	~	х
Memory transfer	transfer 🗸 🗸		х	
PLC calendar display		~	~	~
PLC calendar setting		~	~	х
Debug	Breakpoint / step execution forcible ON/OFF Program operation / condition monitor / sampling trace	~	*	x
Redundancy control	Switch between active and standby CPUs	~	~	х
PLC run/stop		~	~	х
	Backup - Transfer (PLC to file)	~	~	х
	Backup - Transfer (file to PLC)	~	х	х
SX control utility	Backup - Verify	~	~	~
	Data change - Transfer to PLC	~	>	х
	Level 3 password setting	~	х	х
D	Level 2 password setting	~	~	х
Password	Password clear	~	х	х
	Access restriction setting	~	х	х
Failure diagnosis		~	~	~

* For the shaded items (in ____) on the list above, access restriction setting cannot be changed.

Note: If you clear a program or system definition, all passwords are cleared.

(3) Functions to manage password

Operations required to manage the password ("Registration", "Authentication", "Change" and "Clear") and the authority to perform them are as follows:

Function	Access level	Authority	
1) Registration The password is registered for the PLC.	Level 3 user or No password registered	Allowed to register passwords for level 3 and level 2.	
	Level 2 user	Allowed to register only a password for level 2.	
	Level 1 user	Not allowed.	
2) Authentication (logon)	Level 3 user	By performing password authentication for each level,	
Logon operation to allow operations to the PLC.	Level 2 user	operations for each level are allowed. * If password authentication is not performed, access level 1 is provided.	
	Level 1 user		
3) Change	Level 3 user	Allowed to change passwords for level 3 and level 2.	
The registered password is changed.	Level 2 user	Allowed to change a password for level 2.	
	Level 1 user	Not allowed.	
4) Clear	Level 3 user	Allowed to clear passwords for level 3 and level 2.	
All registered passwords are cleared	Level 2 user	Not allowed.	
	Level 1 user	Not allowed.	
5) Restriction setting	Level 3 user	Allowed to change access restriction.	
Operations for each level can be individually enabled/disabled	Level 2 user	Not allowed.	
	Level 1 user	Not allowed.	

* Effective duration of password authentication

Once password authentication is completed, it is effective until the project file is closed.

Appendix 5-2-3 Operation procedure

Appendix 5-2-3-1 Registering password

- Click [Registration/Change] button on the "Password" dialog box. The "Registration/Change" dialog box opens. Check "Access level effective," and you can enter level 3 and level 2 passwords. After entering passwords, click the [OK] button.
- * To register a password, stop the PLC.



* Set the password from 6 to 32 alphanumeric characters and symbols (+, -, =, /). Check "Access level effective." If this option is unchecked, the standard password function is enabled. It is possible to register only the level 3 password. (impossible to register only the level 2 password)

◆ The password is registered.



At this moment, the password is authenticated, and program change or other operations are enabled. Once you close the project file, authentication is reset, and the access level is changed to level 1 (Lowest level).

<Password registration patterns and access level>

Password registration pattern	Authentication and access level after authentication
No password	No restriction (Level 3)
Password is registered. (Access level is not effective.)	Authentication is performed with the registered password. \rightarrow No restriction (Level 3)
Registration/Change Access level effective Password Bassword: xxxxxxx Password gonfirmation: xxxxxxx * Input password with 6-32 characters. OK Cancel	Password authentication is not performed. → Access rights when no password is entered in the Standard password function
Only password for level 3 is registered. (Access level is effective.)	Authentication is performed with the registered password for level 3. \rightarrow No restriction (Level 3)
Registration/Change Access level effective Level 3 Password: reasword gonfirmation: reasword: Password: Password: Password: Password: Password confirmation: * Input password with 6-32 characters. DK Cancel	Password authentication is not performed. → Level 2 access right
Passwords for level 3 and level 2 are registered. (Access level is effective.)	Authentication is performed with the registered password for level 3. \rightarrow No restriction (Level 3)
Access level effective Level 3 Password gonfirmation: second Level 2 Pagsword: recond Password confirmation: recond * Input password with 6-32 characters. DK Cancel	Authentication is performed with the registered password for level 2. → Level 2 access right Password authentication is not performed. → Level 1 access right
	Password registration pattern No password Password is registered. (Access level is not effective.) Fregistration/Change @ docess level effective @ docess level effective @ docess level as construction Ohly password for level 3 is registered. (Access level is effective.) Fregistration/Change @ docess level is effective.) Password gonfinmation: @ docess level is effective.) Password gonfinmation: @ docess level is effective.) @ docess level is effective. @ docess level is effective.) @ docess level is effective.) Registration/Change @ docess level is effective.) Registration/Change @ docess level is effective.) Registration/Change @ docess level effective.) Registration/Change @ docess level is effective.) Registration/Change @ docess level effective.) Registration/Cha

Note: If the same password is set for level 2 and level 3, access is allowed at level 2 after authentication. If you want to access at level 3, set different passwords for level 2 and level 3.

Appendix 5-2-3-2 Password authentication

The password authentication procedure differs depending on whether the project file is opened or not.

(1) When the project file is closed

Click [Online] menu > [PLC operation]. The following dialog box opens. Click the [Password] button to open the "Password" dialog box.

Resource(CPU0)	
Ru	n
	<u>F</u> ailure diagnosis
TERM	
Load from PLC	Destination CPU0 💌
Resource Initialization	<network invalid=""></network>
Password	Close

• The key icon is shown in orange because the password is registered and not authenticated. Click the [Authentication] button.

Password		×
P	The password for the access level is registered. Access level : Level 1	
	Authentication Close	

- * Indicates "Level 1" when password authentication has not been completed (initial state).
- The "Authentication" dialog box opens. Enter the level 2 or level 3 password and click the [OK] button. (In this example, the level 3 password is entered.)

Au	thentication	×
	Password:	

	* Input password with 6-32 characters.	
	OK Cancel]

♦ If the password is correct, the password is authenticated, and the key icon changes to green. Click the [Close] button.

Password	X
The password for the access level is registered. Access level : Level 3	
Authentication Close	

(2) When the project file is opened

Click [Online] menu > [PLC operation]. The following dialog box opens. Click the [Password] button to open the "Password" dialog box.

Resource(CPU0)			
Run			
	Eailure diagnosis		
TERM			
• Batch operation • Individual operation			
Stop	I <u>n</u> itial run		
Run	Reset		
Loa <u>d</u> to PLC	Load from PLC		
Verify with PLC	Clear		
User ROM	Password		
C <u>a</u> lendar	Redundancy control		
Close			

• The key icon is shown in orange because the password is registered and not authenticated. Click the [Authentication] button.

Password	
The password for the access level is registe Access level : Level 1	ered.
Authentication	<u>C</u> lear
RestrictionSetting	Close

* Indicates "Level 1" when password authentication has not been completed (initial state).

The "Authentication" dialog box opens. Enter the level 2 or level 3 password and click the [OK] button. (In this example, the level 3 password is entered.)

Authentication	×
Password:	
* Input password with 6-32 characters.	
OK Cancel	

♦ If the password is correct, the password is authenticated, and the key icon changes to green. Click the [Close] button.

Password	
The password for the access level is registered. Access level : Level 3	
Authentication	
RestrictionSetting Close	

Appendix 5-2-3-3 Changing password

Before the password is changed, password authentication (see Appendix 5-2-3-2) is necessary. The procedure differs depending on whether the project file is opened or not.

 * To change the password, stop the PLC.

(1) When project file is closed.

• Click [Online] menu > [PLC operation]. The following dialog box opens. Click the [Load from PLC] button to read the program.

Resource(CPU0)	
Ru	ın
	<u>F</u> ailure diagnosis
TERM	
Load from PLC	Destination CPU0 💌
<u>Resource Initialization</u>	<network invalid=""></network>
Password	Close

After reading the program, click [Online] menu > [PLC operation]. The following dialog box opens. After this, the procedure is same as "When the project file is opened."

Resource(CPU0)	
Run	
	Eailure diagnosis
TERM	
<u>Batch operation</u>	O Individual operation
Stop	I <u>n</u> itial run
Run	Reset
Load to PLC	Load from PLC
Verify with PLC	Clear
User ROM	Password
C <u>a</u> lendar	Redundancy control
Close	

(2) When the project file is opened

Click [Online] menu > [PLC operation]. The following dialog box opens. Click the [Password] button to open the "Password" dialog box.

Resource(CPU0)		
Run		
	<u>E</u> ailure diagnosis	
TERM		
• Batch operation	O Individual operation	
Stop	I <u>n</u> itial run	
Run	Reset	
Load to PLC	Load from PLC	
Verify with PLC	Clear	
User ROM	Password	
C <u>a</u> lendar	Redundancy control	
Close		

◆ The "Password" dialog box opens. Click the [Registration/Change] button.

Password	×
The password for the access level is registered. Access level : Level 3	
Authentication	
RestrictionSetting Close	

◆ The "Registration/Change" dialog box opens. Enter a new password and click the [OK] button.

egistration/Change 🛛 🔰	
Access level effective	
Level 3	
Password:	

Password <u>c</u> onfirmation:	

Password:	
Password confirmation:	
* Input password with 6-32 characters.	
OK Cancel	

♦ If the PLC is running, the following dialog box appears. Click the [Yes] button to stop the PLC and set the new password.

SX-Prog	rammer Standard 🛛 🛛 🕅	
1	PLC is running.Stop PLC to set the password?	Г
	Yes No	

Password		X
The password Access level	d for the access level is registe : Level 3	rred.
Authentication	Begistration/Change	<u>C</u> lear
	RestrictionSetting	Close

Appendix 5-2-3-4 Clearing password

Before the password is cleared, password authentication at the level 3 is necessary. (Level 2 cannot clear the password.) The procedure differs depending on whether the project file is opened or not.

* To clear the password, stop the PLC.

(1) When project file is closed.

• Click [Online] menu > [PLC operation]. The following dialog box opens. Click the [Load from PLC] button to read the program.

Resource(CPU0)	×
Run	
	<u>F</u> ailure diagnosis
TERM	
Load from PLC	Destination CPU0 💌
<u>Resource Initialization</u>	<network invalid=""></network>
Password	Close

After reading the program, click [Online] menu > [PLC operation]. The following dialog box opens. After this, the procedure is same as "When the project file is opened."

Resource(CPU0)	\mathbf{X}
Run	
TERM	Eailure diagnosis
<u>B</u> atch operation	Individual operation
Stop	I <u>n</u> itial run
Run	Reset
Load to PLC	Load from PLC
Verify with PLC	Clear
User ROM	Password
C <u>a</u> lendar	Redundancy control
Close	
(2) When the project file is opened

Click [Online] menu > [PLC operation]. The following dialog box opens. Click the [Password] button to open the "Password" dialog box.

Resource(CPU0)					
Run					
	Eailure diagnosis				
TERM					
• Batch operation	O Individual operation				
Stop	I <u>n</u> itial run				
Run	Reset				
Loa <u>d</u> to PLC	Load from PLC				
Verify with PLC	Clear				
User ROM	Password				
C <u>a</u> lendar	Redundancy control				
Close					

◆ The "Password" dialog box opens. Click the [Clear] button.

Password	
The password for the access level is n Access level : Level 3	registered.
Authentication	e) <u>C</u> lear
RestrictionSetting.	Close

♦ If the PLC is running, the following dialog box appears. Click the [Yes] button to stop the PLC and clear the password.



Appendix 5-2-4 Changing access restriction setting

The currently set restrictions of online operations can be changed. Only the users with access level 3 can use this function. After performing password authentication, follow the procedure below. The procedure differs depending on whether the project file is opened or not.

* To change the access restriction setting, stop the PLC.

(1) When the project file is closed

• Click [Online] menu > [PLC operation]. The following dialog box opens. Click the [Load from PLC] button to read the program.

Resource(CPU0)	
Ru	ın
	<u>F</u> ailure diagnosis
TERM	▲
Load from PLC	Destination CPU0 💌
<u>Resource Initialization</u>	<network invalid=""></network>
Password	Close

After reading the program, click [Online] menu > [PLC operation]. The following dialog box opens. After this, the procedure is same as "When the project file is opened."

Resource(CPU0)	
Ru	IN
	Eailure diagnosis
TERM	
• Batch operation	O Individual operation
Stop	I <u>n</u> itial run
Run	Reset
Load to PLC	Load from PLC
Verify with PLC	Clear
User ROM	Password
C <u>a</u> lendar	Redundancy control
Close	

(2) When the project file is opened

Click [Online] menu > [PLC operation]. The following dialog box opens. Click the [Password] button to open the "Password" dialog box.



◆ The "Password" dialog box opens. Click the [Registration/Change] button.

Password	\mathbf{X}
The password for the access level is register Access level : Level 3	red.
Authentication	<u>C</u> lear
RestrictionSetting	Close

◆ The "Access Restriction Setting" dialog box opens.



◆ Select the access level to be changed, and then check functions to enable or uncheck functions to disable.

Access Restriction Setting	
Access Level	
Level 3	
Level 2	
Function of Level 2 :	
- ✓ Initial start/Start/Ston/Beset	* Check the checkbox of
✓ Initial statio stati	the functions to access.
Load to PLC - System definition	
Load to PLC - ZIP file	
Load to PLC - FB Parameter data	
Load to PLC - Module driver	
Verify	
Memory clear - Program	
Memory clear - Zin file	
Memory clear - Data memory	
Memory clear - Resource Clear	
User ROM - Write Protection	
User ROM - Export to Text file	
Import Export Default	
Confirm Setup OK Cancel	

- ♦ After completing the setting, click the [OK] button.
- * The setting contents are transferred to the PLC when the [OK] button is clicked. If the PLC is running, the following dialog box appears.

SX-Prog	rammer Standard 🛛 🕅
?	PLC is running.Stop PLC to set the access restriction?
	Yes No

<Checking set items>

Click the [Confirm Setup] button on the "Access Restriction Setting" dialog box to open the following window. You can check the current setting status.

(Confirm Setup						
	Function Name		Level 3	Level 2	Level 1		
	Initial start/Start/Stop/Reset		0	0	×		
	Load to PLC - Program		0	0	×		
	Load to PLC - System definition		0	x	x		
	Load to PLC - ZIP file		0	0	x		
	Load to PLC - FB Parameter data		0	0	×		
	Load to PLC - Module driver		0	х	×		
	Verify		0	0	0		
	Memory clear - Program		0	х	x		
	Memory clear - System definition		0	x	x		
	Memory clear - Zip file		0	0	x		
	Memory clear - Data memory		0	0	×		
	Memory clear - Resource Clear		0	0	x		
	User ROM - Write Protection		0	0	x		
	User ROM - Export to Text file		0	0	×		
	Failure diagnosis		0	0	0	-	
	<				3		
		Close			<u>A</u> ll Sele	ct	

<Initializing set items>

Click the [Default] button on the "Access Restriction Setting" dialog box. The following dialog box appears. Click the [OK] button to reset the access restriction settings.



* For the default setting of the access restriction, refer to the table in "Appendix 5-2-2."

<Exporting settings>

The settings of the selected access level can be saved under an arbitrary filename. (The extension is ".ARI".) You can export the saved file and use it as a kind of template.

In the "Access Level" list box on the "Access Restriction Setting" dialog box, select the access level to save in a file, and then click the [Export] button. The "Export" dialog box opens.

Access Restriction Setting	X
Level 3	7
Level 2	
Level1	
Eunction of Level 2:	
Initial start/Start/Stop/Reset	•
🔽 Load to PLC - Program	
Load to PLC - System definition	
🔽 Load to PLC - ZIP file	
Load to PLC - FB Parameter data	
Load to PLC - Module driver	
Verify	
Memory clear - Program	
Memory clear - System definition	
Memory clear - Zip file	
Memory clear - Data memory	
Memory clear - Resource Clear	
User ROM - Write Protection	
User ROM - Export to Text file	-
Import Default	
Confirm Setup OK Cancel)

◆ Enter a file name and click the [Save] button.

Export			? 🗙
Save in: 🗀	PLC_Program 🔽 🕥 🤌	ø	•
Ladder PLC_Data RasMsg Sampling_Su SysDef Tag Tag Tag_Prj	etting_File		
File <u>n</u> ame:	MachineA_AccessLevel2_setting		<u>S</u> ave
Save as <u>t</u> ype:	Access Restrict Information file(*.ARI)		Cancel

<Importing settings>

You can import access restriction settings saved by the export function.

In the "Access Level" list box on the "Access Restriction Setting" dialog box, select the access level to import, and then click the [Import] button. The "Import" dialog box opens.

Access Restriction Setting
Access Level
Level 3
Eunction of Level 2:
✓ Initial start/Start/Stop/Reset
✓ Load to PLC - Program
Load to PLC - System definition
✓ Load to PLC - ZIP file ✓ Load to PLC - EB Parameter data
Load to PLC - Module driver
Verify
Memory clear - Program
Memory clear - System definition
Memory clear - Zip file
Memory clear - Data memory
Memory clear - Resource Llear Memory Clear - Resource Llear Memory Llear - Roman - Write Protection
User ROM - Export to Text file
Import <u>D</u> efault
Confirm Setup OK Cancel

◆ Select a file to import and click the [Open] button.

Import				? 🗙
Look jn: 🛅	PLC_Program 🔽 🤇	96	Þ	-
Ladder PLC_Data Sampling_S SysDef Tag Tag_Prj	etting_File AccessLevel2_setting.ARI			
File <u>n</u> ame:	MachineA_AccessLevel2_setting.ARI			<u>O</u> pen
Files of <u>t</u> ype:	Access Restrict Information file(*.ARI)	*		Cancel

Appendix 5-3 Notes on Use

(1) When you forget password

If you forget the password, access at level 2 and level 3 is impossible.

(2) Position of key switch

Set the key switch of the CPU module to the "TERM" position. If the switch is set at the "RUN" or "STOP" position, you cannot register a password.

(3) State of PLC

When the PLC is in the following states, you cannot register a password for the access level 2 or 3.

- When the program and system definition have not been downloaded
- When the breakpoint function is used
- When the condition monitor function is used
- · When the sampling trace function is used
- When a user ROM card is write-protected
- When in a N-to-1 redundant system

When a function No. where a password is stored has already been used

The function No. where the password is stored depends on the PLC type.

SPH300: 510, SPB: 14, Board controller [SPB] : 510

(4) Consumption of program memory

When registering passwords for access level 3 and level 2, 33 steps of program memory is consumed. If there is not 33 steps or more available space in the program memory, you cannot register a password.

In addition, when a program with maximum steps is downloaded to the PLC in which a password with the access level 2 or 3 is registered, the 3-level access restriction function is disabled and changed to the standard password function.

(5) Loading program

A project that uses the following No. cannot be loaded to the PLC for which a password of 3-level access restriction function is set: SPH300: 510, SPB: 14, Board controller [SPB] : 510

(6) Setting password with user ROM utility

You cannot set a password of the 3-level access restriction function for the user ROM with the user ROM utility. To set a password for the user ROM, mount it on the PLC, set the key switch to the "UROM-TERM" position, and then set a password for the PLC.

(7) Setting password in multi-CPU system

In a multi-CPU system, set a password for each CPU. When you want to register the same password for all the CPUs, set it for each CPU.

Appendix 6-1 Overview of ST Language

Appendix 6-1-1 ST operators

Operators that can be used in ST language are listed below:

No.	Operation	Operator	Example
1	Parentheses	(expression)	
2	Function	Function name (parameter)	WM1 := BCD(WM0); WL100 := BMOV(WL0, 5);
3	Exponentiation	**	DM100 := DM0 ** REAL#3.0;
4	Logical not	NOT	Y2.0 := NOT X1.0;
5	Multiplication	*	DM10 := DM8 * DINT#1000;
6	Division	1	DM12 := DM12 / DINT#3;
7	Division remainder	MOD	WL10 := WM0 MOD 10;
8	Addition	+	WM2 := WM0 + WM1;
9	Subtraction	-	WM3 := WM2 - 100;
10	Comparison	<, >, <=, >=	M0 := WM100 > 100;
11	Equality	=	M1 := DM100 = DINT#10000;
12	Inequality	<>	M2 := WL200 <> 1000;
13	Logical Product	&, AND	M3 := M1 & X1.0;
14	Exclusive or	XOR	WM100 := WM99 XOR WL100;
15	Logical add	OR	WM0 := WX1.0 OR 16#00FF;

* Take note of data types available in each operator.

Appendix 6-1-2 ST statements

The following eight control statements are used in ST language.

Format	Description
:=	Assignment statement. Assigns the value of the expression, variable, or numeric value on the right-hand side to the variable on the left-hand side.
IF	Condition statement. Executes the executable statement if the conditional expression is true.
CASE	Condition statement. Selects the executable statement to be executed according to the value of the conditional expression.
FOR	Iteration statement. Repeatedly executes the executable statement according to the initial value, final value, and incremental or decremental value.
WHILE	Iteration statement. Repeatedly executes the executable statement while the loop condition is true.
REPEAT	Iteration statement. Repeatedly executes the executable statement until the loop condition is true.
RETURN	Return statement. Returns control from the called function or function block to the calling POU.
EXIT	Exit statement. Used to exit an iteration loop.

Appendix 6-1-3 Basic description specifications

(1) Basic syntax of instruction

The describing method in ST language is as follows:



(2) Example of describing a multi-operation

In the Standard loader, monomial expressions are used for the representation of expressions. Therefore, a multi-operation that uses multiple operators must be described as follows:

Example of multi-operation (WM0 + WM1 + WM2) / 3 = WM3

ST language representation

WM3 := WM0 + WM1; WM3 := WM3 + WM2; WM3 := WM3/3:

* To change multi-operation to single-operation, use "Multi operation input wizard." Refer to Appendix 6-3-2.

(3) Example of describing a sequential circuit

Sequential circuits can also be described in ST language.



A comment is created above an instruction line.

```
-----
(*Execute processing when M0 is turned ON*) ← A comment is created above an instruction line.
IF M0 = TRUE THEN
 WL100 := WL101 + 100 ;
```

END_IF;

Note: When creating a comment on the right of an instruction line:



Appendix 6-2 How to Use Control Statements

Appendix 6-2-1 Condition statements

The condition statement is a control statement to execute the selected instruction (executable statement) if certain conditions are met. Two types of condition statements, the IF statement and CASE statement, are provided.

(1) IF statement

For the IF statement, three types of syntaxes are provided according to the option to be executed.

<1) IF...THEN structure>

When the value of the conditional expression is TRUE, the executable statement is evaluated (executed). When the value of the conditional expression is FALSE, nothing is executed.



* For the "conditional expression", a monomial expression whose operation result is a BOOL type value can be used. If you want to designate an operation result of a multi-operation as the condition, program as shown in the sample program 4.



< 2) IF...ELSE structure (choice between two) >

When the value of the conditional expression is "TRUE", the executable statement 1 is evaluated and when the value is "FALSE", the executable statement 2 is evaluated.



ELSE



< 3) IF...ELSIF structure >

When the value of the conditional expression 1 is "TRUE", the executable statement 1 is evaluated. When the value is "FALSE", the next conditional statement 2 is evaluated. Then, when the value of the conditional expression 2 is "TRUE", the executable statement 2 is evaluated. When the value is "FALSE", the conditional statement 3 is evaluated next. Thus, selectively branched processing can be realized.

<Basic syntax>



(2) CASE statement

The condition expression of the CASE statement is used when the executable statement is selected by a single INT type value.

<Basic syntax>



<Flowchart>



<Method of expressing INT-type selection value>

- INT-type selection values can be expressed by numeration or range.
 - Expression by numeration ⇒ Delimit the selection values with commas (,) to register.
 - Expression by range
 ⇒ Express the range with "..".



Appendix 6-2-2 Iteration control statements

The iteration statement is used to execute one or more instruction repeatedly according to a certain condition.

(1) FOR statement

The FOR statement repeatedly executes the instruction (executable statement) according to the iteration count (word address).

<Basic syntax>





* A determination whether the iteration count has reached the final value or not is made before the executable statement. Therefore, at the instant when the iteration count has exceeded the final value, the next process begins.

Note: "-" (minus) cannot be used for the incremental value of the FOR statement. Be sure to prevent the result of the expression becoming a minus.

(2) WHILE statement

The WHILE statement repeatedly executes the executable statement while the value of the condition expression whose operation result is a BOOL type value is "TRUE".

<Basic syntax>

WHILE <loop conditional="" expression=""></loop>	DO
<executable statement="">;</executable>	
END_WHILE;	

<Flowchart>



* Due to a loop, a determination is made before the executable statement. Therefore, if the value of the conditional expression has been "FALSE" from the beginning, the executable statement is never processed.

(3) REPEAT statement

The REPEAT statement repeatedly executes the executable statement until the value of the final conditional expression becomes "TRUE".





<Flowchart>



* In the REPEAT statement, a determination of the loop condition is made after the executable statement. Therefore, even if the final conditional expression is "TRUE", the executable statement is inevitably executed at least once.

(4) EXIT statement

The EXIT statement is only used in the iteration control statement (FOR, WHILE, and REPEAT statement). If the EXIT statement is executed, the loop processing can be terminated halfway through.

Appendix 6-2-3 RETURN statement

The RETURN statement is used in a user function or a user function block. When the RETURN statement is executed, control is immediately returned from the user function or user function block to the main program.

<Flowchart of RETURN statement processing>



Appendix 6-2-4 Nesting structure of control statements

When another control statement is used in the control statement (condition statement or iteration statement), up to eight levels of nesting are allowed. (nesting structure)

<Example of nesting>

The following is an sample program of a function block operation that stores data in the INT-type array data from 1 to 100.



Note: Although up to eight levels of nesting are allowed (guaranteed operation), the program may become complicated if the nesting is deep. Therefore, when you program, it is recommended that the nesting depth should be four of five levels at the deepest.

Appendix 6-3 Operations of ST Language Editor

Appendix 6-3-1 Basic operations

(1) Adding a program

To create a program in ST language, select "ST" for the language type when the program is inserted.

Select the position to insert a program in the project view window, and click [Edit] menu > [Insert Program]. The "Insert Program" dialog box opens. Enter a name, choose "ST" for the language, and then click the [OK] button.

Project View			
Project 'Project1'			
📲 System Definitio	n		
Resource (CPU0)): NP1PS-74		
🖃 🛄 Programs	- 4 1		
🖃 🛃 Default:	Default		
		27	
Fixi	Open		
Device	Insert		
🔄 Unassigned	Insert Unassigned Programs		
	Delete		
Array/Strue	Cu <u>t</u>		
E2	⊆ору		
E.	Paste		
	D <u>e</u> vice		
	Properties		
Insert Program			
Insert Program Program Number:	1	Language	lder
Program Number:	1	Language	lder
Program Number:	1	Language O Lad	lder
Insert Program Program Number: Name:	1	Language O Lad O ST	lder) 9 ENO
Insert Program Program Number: Name: Comment	1 5T1	Language Lad ST Use	lder) 9 ENO
Insert Program Program Number: Name: Comment	1 5T1	Language Lad ST Use	lder) a ENO
Insert Program	1	Language O Lad O ST	lder) ≥ ENO
Insert Program Program Number: Name: Comment	1	Language Lad ST	lder) • ENO
Insert Program Program Number: Name: Comment Comment Changing line is 'Ctr	1	Language Lad ST Use	lder) a ENO
Insert Program Program Number: Name: Comment Comment Changing line is 'Ctr	1	Language Lad ST Use	lder) • ENO

◆ The program is added in the project view window.



(2) Programming

The basic operations for creating a program in ST language is explained below.

◆ Write a program in ST language on the program editing area.



After writing a program, click [Conversion] menu > [Conversion]. The program is converted, and syntax check of ST language is also performed. If there is any syntax error, the error is displayed.

Error				саналасын алар . Х.
Туре	Explanation	Program Name	Circuit No./Line No.	Device No.
2	Invalid data type of the operation result!	ST1	1	
2	Semicolon (;) is necessary for this line or the previous line.	ST1	4	
Error : 2	Warping + 0		0.14	
Error ; 2	, waning to		0.1K	

(3) Monitoring

A program created in ST language is monitored as shown below.



* For ST language programs, the device on the left of the assignment statement (:=) and, in the case of IF statement or WHILE statement, the leftmost device are monitored. In addition, for an FB or a function, the value of the device that is designated as the first operand is displayed.

Appendix 6-3-2 Applied operations

(1) Inserting an instruction using the wizard function

Control statements, FBs, functions can be inserted by using the wizard function.

Place the cursor on the row to insert an instruction and then press the <F10> key, the "Instruction Enter" dialog box opens. Select a instruction and click the [OK] button to insert it as shown below. In "(* *)", the data type of the device to be entered is displayed.

Instruction Enter	×
Instruction: TON	OK Cancel
All Keyword Transfer Arithmetic Conversion Logical Compare String Time Timer/Counter System FB Others	Instruction Description CTD When the elapsed value reaches 0, the outp CTU When the elapsed value reaches the preset MR The timer continues output until reaching the RCT The elapsed value is reset when the input is TMR The timer signal is used to count the integrate TOF The output signal is set Off when the timer re TON The output signal is set On when the timer re TP The timer continues output until reaching the



ST1*	
1	IF WMO = 0 THEN
2	WM100 := 100;
3	WM101 := WM100;
4	END_IF;
5	
6	TON_0(IN := (*BOOL*), PT := (*TIME*));
7	(*BOOL*) := 10000; (*TON.Q*)
8	(*TIME*) := /T0000; (*TON.E7*)
9	

Rewrite these with actual devices.

(2) Multi operation input wizard

In ST language, multi operators cannot be described; however, it can be changed to monomial expression if you use "Multi operation input wizard."

After entering multi operators on a worksheet, place the cursor on the row of multi operators. Click [Edit] menu > [Multi operation input wizard]. The "Multi operation input wizard" opens.



Assign the place displayed as "Tmp" to unused memory and then click the [OK] button.

M	ulti operation input wizard	K
	Multi operational expression:	
	WM10 := (WM11 + WM12) * WM13;	
	Single operational expression:	
	WM20 := WM11 + WM12; WM10 := WM20 * WM13;	
	Message: Changing line is 'Ctrl + Enter'	1
	Converted into single operational expression. Please change temporary address (Tmp*) to the memory address.	
	OK Cancel	j :

◆ Multi operators are changed to monomial expression. The original multi operators are left as a comment.

ST1*	
1	IF WMO = 0 THEN
2	WM100 := 100;
3	WM101 := WM100;
4	END_IF;
6	(* WM10 := (WM11 + WM12) * WM13; *)
7	WM20 := WM11 + WM12;
8	WM10 := WM20 * WM13;

Appendix 6-3-3 Restrictions on program creation in ST language

(1) Display and Edit

- The indent is automatically adjusted to the fixed width.
- Blank lines are cut down and not displayed.
- A comment in a statement is displayed on another row.
- A multi-operation using two or more operators cannot be created on a single row. Use multi operation input wizard.

When using SPH2000/SPH3000 for replacement of MICREX-F series, various dedicated instructions (suffixed with "_MF") are provided. Therefore, you do not need to read this section. Refer to "Convert Instructions (FEH588-1). SPH200/SPH300 series do not support instructions with "_MF." Refer to the following proposals for the instructions that cannot be converted by program conversion.

Also when replacing FLEX-PC, refer to the refer to the following proposals for the instructions that cannot be converted by program conversion.

< MICREX-F series alternative proposal >

[Conversion Instructions] Character String [File Instructions] Data Table Definition Data Data End File Information [Program Control Instructions] Program Entry Program End **Function Module Call Function Module Start** Function Module End [Index Register Control Instructions] <u>Push</u> <u>Pop</u> Load Effective Index Register Addition Index Register Subtraction

* Instruction without alternative method

Character String

"Character String" instruction is not supported in SX-Programmer Standard. The alternative solution is explained.

1. The address is set by "PLC functions -> Initial data List". The character string is input to the initial value.

Data Table Definition/Data/Data End

"Data Table Definition/Data/Data End" instruction is not supported in SX-Programmer Standard. The alternative solution is explained.

"Data Table Definition/Data/Data End" is an instruction by which the user file used by the file instruction is registered as a data table, and data is set.

The data table differs from the file, and is an area only for reading.

In the alternative solution, it considers that the usual memory area is a data table, and the data between "Data Table Definition" and "Data End" is set.

Please transfer data by using "Move" instruction for a consecutive area in a usual memory area.

The characteristic only for reading has been achieved by always executing "Move" instruction.

1		MOVE	1000 →	WM 000001
2	ON] [MOVE	2000 →	WM 000002 0
3	<u>on</u>] [MOVE	3000 →	WM 000003 0
4	ON] [MOVE	-1000 →	WM 000004
5	ON] [MOVE	-2000 →	WM 000005 0
6	ON] [MOVE	-3000 →	000000
7	ON] [MOVE	100 →	000007 00
8	ON] [MOVE	200 →	WM 000008
9	ON] [MOVE	300 →	000009 0
10	ON] [MOVE	-100 →	WM 00000A
ĥ s	ON] [MOVE	-200 →	<u>₩М</u> 00000B
12	ON] [MOVE	-300 →	WM 000000C 0
13		END		}

Data Table Definition/Data/Data End Program Alternative

File Information

"File Information" instruction is not supported in SX-Programmer Standard. The alternative solution is explained.

"File Information" instruction" is an instruction to acquire the value of the changed file pointer if "FIFO" and "FIFO" instructions is executed.

The file pointer (word) is stored in the address of file area size +1 in the file area specified in First-In First-Out (FIFO) and first in last out (FILO), and acquire it in the transfer command, please.

Program Entry/Program End

"Program Entry/Program End" instruction is not supported in SX-Programmer Standard. The alternative solution is explained.

<<MICREX-F>> |-----[PROG N1: N2: N3]

"Program Entry/Program End" is an instruction to declare program initiation and the end. The program is registered in the project window in SX-Programmer Standard. Right-clicks by the program composition of the project tree displayed in the project window. "Insert" is selected, and the program is registered.

It is necessary to allocate to the task of the project tree to execute the registered program. Please register in the way according to the parameter of the program entry as follows.

N1=0:

Please allocate in the default task.

N1=50:

Please allocate in the fixed cycle task. at that time, please set the value of N2 in setting at the cycle.

N1=60 - 67:

Please allocate in the event task.

N1=510:

It is a block management division declaration not supported in SX-Programmer Standard. It is not possible to register.

N1=511:

It is a block definition declaration not supported in SX-Programmer Standard. It is not possible to register.

Function Module Call/Function Module Start/Function Module End

"Function Module Call/Function Module Start/Function Module End" instruction is not supported in SX-Programmer Standard. The alternative solution is explained.

- 1. "Function Module Call" can be substituted as a part call of the FB instance. Please set up the parameter set up by the DATA instruction of "Function Module Call" as parameter of part call of FB instance.
- 2. "Function Module Start" "Function Module End" (Function module execution part) can be substituted as body section of the FB instance.

Push/Pop

"Push/Pop" instruction is not supported in SX-Programmer Standard. The alternative solution is explained.

In "MICREX-SX", the memory cannot be designated index.

In alternative solution, the offset based on the address stored by load effective address is stored as virtual index register. The address is not stored. Therefore, it is necessary to understand the address which the user stored.

It is possible to use only up to five of I, j, k, I, m in MICREX-F. Therefore, processing by which the content of the index register is saved is needed. But, there is no necessity in MICREX-SX only it is to memorize the offset in a usual memory area.

Therefore, even if "Push instruction" is used, the content of the index register need not be saved. Please newly set and use a virtual index register for the memory area which can be used.

Please use a virtual index register before "Push instruction" is used if "Pop instruction" is used.

[LEA BD0210: i]	[MOV 0 ->WMOO10]-	 − : New virtual index
	1	I the action

Load Effective Address

"Load Effective Address" instruction is not supported in SX-Programmer Standard. The alternative solution is explained.

In "MICREX-SX", the memory cannot be designated index. Therefore, a user needs to understand the address set as the index register.

- 1. At instruction alternatives, the memory area used as a virtual index register is initialized by 0.
- 2. Please understand the address set in the index register by "MICREX-F". (When referring to the index register, it is needed.)

Index Register Addition

"Index Register Addition" instruction is not supported in SX-Programmer Standard. The alternative solution is explained.

In "MICREX-SX", the memory cannot be designated index. Therefore, a user needs to get to know the address set as the index register.

1. At instruction alternatives, the memory area used as a virtual index register is added.

Index Register Subtraction

"Index Register Subtraction" instruction is not supported in SX-Programmer Standard. The alternative solution is explained.

In "MICREX-SX", the memory cannot be designated index. Therefore, a user needs to get to know the address set as the index register.

1. At instruction alternatives, the memory area used as a virtual index register is subtracted.



Index Register Control Instructions Program Alternative


Instruction without alternative method(MICREX-F)

There is not an alternative method of the following instructions.

- Block Diagram
- Conversion to Seconds (SEC)
- Conversion from Seconds (TIM)
- Disabled/Enabled interrupted (DI, EI)

< FLEX-PC series alternative proposal >

[Basic Control Instructions] <u>Direct Input/Output</u>

[Program flow Instructions] Interruption pointer/End of Interrupt program User Macro Commands

[Comparison Instructions] Comparison Double Comparison

[Range Comparison Instructions] Range Comparison Double Range Comparison

[Transfer Instructions] <u>8Bit Transfer</u> <u>Digit Transfer</u>

[Rotate/Shift/32Bit Rotate Instructions] <u>Rotate Right Carry n</u> <u>Rotate Left Carry n</u> <u>Double Rotate Right Carry n</u> <u>Double Rotate Left Carry n</u>

[Step Control Instructions] Step Control

[Real Instructions] Real Comparison Real Range Comparison

[Time Instructions] <u>Time Comparison</u> <u>Time Range Comparison</u>

[Some instructions] Some instructions which can not be pasted

* Instruction without alternative method

Direct Input/Output

"Direct Input/Output" instruction is not supported in SX-Programmer Standard. The alternative solution is explained.

- 1. The fixed cycle task is made according to the procedure of "Make of the fixed cycle task."
- 2. In this case, please set the priority of the task setting as high as possible (cyclic 0>3>task).
- 3. Program made by processing 1 is arranged in the fixed cycle task according to the procedure of "Registration of the program".
- 4. The time of the SX bus baton is set according to the procedure of "Set of the time of the baton".

Interruption pointer/End of Interrupt program

"Interruption pointer/End of Interrupt program" instruction is not supported in SX-Programmer Standard. The alternative solution is explained.

1. Make a program from "Interruption pointer" to " End of Interrupt program " into program.

[In case of fixed-cycle interrupt]

2. The fixed cycle task is made according to the procedure of "Make of the fixed cycle task."

3. Program made by processing 1 is arranged in the fixed cycle task according to the procedure of "Registration of the program."

[In case of interrupt by an interrupt module or counter count-up]

2. The event task is made according to the procedure of "Make of the event task."

3. Program made by processing 1 is arranged in the event task according to the procedure of "Registration of the program."

User macro commands

User macro commands instruction is not supported in SX-Programmer Standard. The alternative solution is explained.

- 1. The I/O parameter is set, and user macro commands caller program is converted into the call part of the FB instance.
- 2. The I/O parameter is set, and user macro commands executor program is converted into the body part of the FB instance.

User macro commands Program Alternative

[User macro commands caller program is alternative into the call part of the FB instance]

<< FLEX-PC N >>



<< MICREX-SX >>

	MOVE		H0040 \rightarrow		WM 000001 H0000
	MOVE		H0020 →		WM 000002 H0000 }
6 20		0000000000		87.03.07	
		USERFB		RUN	00000
					WM 000001
			PARA		H0000
					WM 000002
			PARA		H0000
					M 00000A
			PARA		OFF
M 00000A					M 000004 (S)
11					6-9
	TEND				

[User macro commands executor program is alternative into the body part of the FB instance]

<< FLEX-PC N >>





Comparison

"Comparison" instruction is not supported in SX-Programmer Standard. The alternative solution is explained.

- 1. New program(FB) is made, and the input parameter(origin of comparison, destination of comparison) I/O parameter (comparison result flag1, 2) is set.
- 2. When it is "origin of comparison > destination of comparison," comparison result flag1 and comparison result flag2 are set in "OFF."
- 3. When it is "origin of comparison = destination of comparison," comparison result flag1 is set in "ON" and, comparison result flag2 is set in "OFF."
- 4. When it is "origin of comparison < destination of comparison," comparison result flag1 is set in "OFF" and, comparison result flag2 is set in "ON."

The following figures show the relation between the above-mentioned comparison result flag 1, 2.

Big and small relation	Comparison result flag1	Comparison result flag2
Origin of comparison > destination of comparison	OFF	OFF
Origin of comparison = destination of comparison	ON	OFF
Origin of comparison < destination of comparison	OFF	ON

<< FLEX-PC N >>

Seizing signal

] [[CMP	S1	S2]-[
--	-----	-------	----	----	-----

S1: Origin of comparison

S2: Destination of comparison



<<Call processing when making to FB with SX-Programmer Standard>>

	USERFB	CMP	0	
WMO	- #V1 IN1			
WM1	- #V2 IN2			
M10	- V3 IN3		V3 IN3	- M10
M20	- ¥4 IN4		V 4 IN 4	- M2O

Comparison Program Alternative

1	Then velotion as	ndition is "Trust			
	"V0003"."V0004"	is made "OFF".	in , the output	, parameter	
		Comparis	Comparis		Comparis
		on Addre	on Addre		on Flag
		WV	WV		v
		0001	0002		0003
2	5		н		(R)
					Comparia
					comparis on Flow
					UN FIAG
					0004
					0004 (R)
	1000 07 07				(1)
3	When relation co is made "ON".	ndition is "Trut	th", the output	; parameter "VOOO3"	
		Comparis	Comparis		Comparis
		on Addre	on Addre		on Flag
		WV	WV		V
		0001	0002		0003
4	=		П		(S)
					Comparis
					on Flag
					V
					0004
			2		(R)
F	TT		-1. [[
5	when relation co	ndition is "frut	in", the output	parameter "vuuu4"	
	15 made on .	Comparis	Comparis		Comparis
		on Addre	on Addre		on Flag
		MA MA	MA		V
		0001	0002		0003
6	12		h		(R)
2	P				2000-000
					Comparis
					on Flag
					V
					0004
			5. C		(s)
7				END	
	I				

Double Comparison

"Double Comparison" instruction is not supported in SX-Programmer Standard. The alternative solution is explained.

- 1. New program(FB) is made, and the input parameter (origin of comparison, destination of comparison) I/O parameter (comparison result flag1, 2) is set.
- 2. When it is "origin of comparison > destination of comparison," comparison result flag1 and comparison result flag2 are set in "OFF."
- 3. When it is "origin of comparison = destination of comparison," comparison result flag1 is set in "ON" and, comparison result flag2 is set in "OFF."
- 4. When it is "origin of comparison < destination of comparison," comparison result flag1 is set in "OFF" and, comparison result flag2 is set in "ON."

The following figures show the relation between the above-mentioned comparison result flag1, 2.

Big and small relation	Comparison result flag1	Comparison result flag2
Origin of comparison > destination of comparison	OFF	OFF
Origin of comparison = destination of comparison	ON	OFF
Origin of comparison < destination of comparison	OFF	ON

<< FLEX-PC N >>

Seizing signal

] [[DCMP	S1	S2]-[
-----------	----	----	-----

S1: Origin of comparison

S2: Destination of comparison

↓

<<Call processing when making to FB with SX-Programmer Standard>>

	USERFB	DCMP	0	
DMO	DV1 IN1			
DM2	- DV2 IN2			
M10	- V3 IN3		V3 IN3	- M10
M20	- V4 IN4		V4 IN4	- M2O

Double Comparison Program Alternative

1	When relation a	ndition is "Trut	the output	. Novemeter	
	"V0003","V0004"	is made "OFF".	un, une output	, parameter	
	10000 / 10001	Comparis	Comparis		Comparis
		on Addre	on Addre		on Flag
		DV	DV		v
		0001	0002		0002
~	F-2	0001	0002		(D)
2	>				(K)
					Comparis
					on Flag
					v
					0004
					(R)
	10000				(1.)
3	When relation co is made "ON".	ondition is "Trut	th", the output	parameter "VOOO3"	
	And a second desired and the second	Comparis	Comparis		Comparis
		on Addre	on Addre		on Flag
		DV	DV		V
		0001	0002		0003
4			h		(\$)
- C	<u> </u>				
					Comparis
					on Flag
					V
					0004
			8		(R)
5	When relation co	ondition is "Trut	th", the output	c parameter "VOOO4"	
	is made "ON".				
		Comparis	Comparis		Comparis
		on Addre	on Addre		on Flag
		DV	DV		V
		0001	0002		0003
6	2		h		(R)
	<u> </u>				
					Comparis
					on Flag
					v
					0004
			2		(S)
្ឋ					
7				END	

Range Comparison

"Range Comparison" instruction is not supported in SX-Programmer Standard. The alternative solution is explained.

- 1. New program(FB) is made, and the input parameter(origin of comparison1, 2, destination of comparison) I/O parameter (comparison result flag1, 2, 3) is set.
- 2. When it is "origin of comparison1 > destination of comparison," comparison result flag1 is set in "ON" and, comparison result flag2, 3 is set in "OFF."
- 3. When it is "origin of comparison 1 <= destination of comparison," and "destination of comparison <= origin of comparison2," comparison result flag2 is set in "ON" and, comparison result flag1, 3 is set in "OFF."
- 4. When it is "destination of comparison > origin of comparison2," comparison result flag3 is set in "ON" and, comparison result flag1, 2 is set in "OFF."

The following figures show the relation between the above-mentioned comparison result flag1, 2, 3.

Big and small relation	Comparison result flag 1	Comparison result flag 2	Comparison result flag 3
Origin of comparison1 > destination of comparison	ON	OFF	OFF
Origin of comparison1 <= destination of comparison and destination of comparison <= Origin of comparison2	OFF	ON	OFF
Destination of comparison > Origin of comparison2	OFF	OFF	ON

<< FLEX-PC N >>

Seizing signal

|--|

S1: Origin of comparison1

S2: Origin of comparison2

S : Destination of comparison

 \downarrow

<<Call processing when making to FB with SX-Programmer Standard>>

	USERFB	ZOP	0	
WMO	- WV1 IN1			
9M1	- ₩¥2 IN2			
₩M2	- WV3 IN3			
₩10	- V4 IN4		V 4 IN 4	- M10
₩20	- V5 I N5		V5 IN5	- M2O
₩30	- V6 IN6		V6 IN6	- M3O

Range Comparison Program Alternative

	Comparia	Commerie		Comp
	on Addre	on Addre		on F
	WV	WV		v
	0001	0003		0004
>				(
				Сощр
				on F
				V
				0005
				Comp
				on F
				V
				0006
			111110/1010 // WOOD F/	
is made "ON".	condition is "Tru	th", the output	arameter "VUUUS"	
	Comparis	Comparis	Comparis Comparis	Comp
	on Addre	on Addre	on Addre on Addre	on F
	WV	WV	WV WV	v
	0001	0003	0003 0002	0004
<=				
				Comp
				on F
				V
				0003
				1
				Comp
				on F
				۷
				0006
				0006 (
Mhen relation	condition is "Trut	th" the output	arameter "WOOD6"	0006
When relation is made "ON".	condition is "Tru	th", the output	arameter "V0006"	0006
When relation is made "ON".	condition is "Trut Comparis	th", the output Comparis	arameter "V0006"	0006 (Comp
When relation is made "ON".	condition is "Tru Comparis on Addre	th", the output Comparis on Addre	arameter "V0006"	0006 (Comp on F
When relation is made "ON".	condition is "Tru Comparis on Addre WV	th", the output Comparis on Addre WV	arameter "V0006"	0006 (Comp on F V
When relation is made "ON".	condition is "Tru Comparis on Addre WV 0003	th", the output Comparis on Addre WV 0002	arameter "V0006"	0006 (Comp on F V 0004
When relation is made "ON". >	condition is "Trus Comparis on Addre WV 0003	th", the output Comparis on Addre WV 0002	arameter "V0006"	0006 (on F V 0004 (
When relation is made "ON". >	condition is "Tru Comparis on Addre WV 0003	th", the output Comparis on Addre WV 0002	arameter "V0006"	0006 (on F V 0004 (Comp
When relation is made "ON". >	condition is "Tru Comparis on Addre WV 0003	th", the output Comparis on Addre WV 0002	arameter "V0006"	0006 Comp on F V 0004 Comp on F
When relation is made "ON". >	condition is "Tru Comparis on Addre WV 0003	th", the output Comparis on Addre WV 0002	arameter "V0006"	0006 Comp on F V 0004 Comp on F V 0005
When relation is made "ON". >	condition is "Tru Comparis on Addre WV 0003	th", the output Comparis on Addre WV 0002	arameter "V0006"	0006 Comp on F V 0004 Comp on F V V 0005 (0005
When relation is made "ON". >	condition is "Tru Comparis on Addre WV 0003	th", the output Comparis on Addre WV 0002	arameter "V0006"	0006 Comp on F V 0004 Comp on F V 0005
When relation is made "ON". >	condition is "Tru Comparis on Addre WV 0003	th", the output Comparis on Addre WV 0002	arameter "V0006"	0006 Comp on F V 0004 Comp on F V 0005 (Comp 0005
When relation is made "ON". >	condition is "Tru Comparis on Addre WV 0003	th", the output Comparis on Addre WV 0002	arameter "V0006"	0006 Comp on F V 0004 Comp on F V 0005
When relation is made "ON". >	condition is "Tru Comparis on Addre WV 0003	th", the output Comparis on Addre WV 0002	arameter "V0006"	0006 Comp on F V 0004 Comp on F V 0005
When relation is made "ON". >	condition is "Tru Comparis on Addre WV 0003	th", the output Comparis on Addre WV 0002	arameter "V0006"	0006 Comp on F V 0004 Comp on F V 0005 Comp on F V 0005 (Comp on F V 0005 (Comp (Comp (Comp (Comp ((Comp (((((((((((((
When relation is made "ON". >	condition is "Tru Comparis on Addre WV 0003	th", the output Comparis on Addre UV 0002	arameter "V0006"	0006
When relation is made "ON". >	condition is "Tru Comparis on Addre WV 0003	th", the output Comparis on Addre UV 0002	arameter "V0006"	0006 Comp on F V 0004 Comp on F V 0005 (Comp on F V 0006 (Comp on F (0006 (0006 (0066) (

Double Range Comparison

"Double Range Comparison" instruction is not supported in SX-Programmer Standard. The alternative solution is explained.

- 1. New program(FB) is made, and the input parameter(origin of comparison1, 2, destination of comparison) I/O parameter (comparison result flag1, 2, 3) is set.
- 2. When it is "origin of comparison1 > destination of comparison," comparison result flag1 is set in "ON" and, comparison result flag2, 3 is set in "OFF."
- 3. When it is "origin of comparison1 <= destination of comparison," and "destination of comparison <= origin of comparison2," comparison result flag1, 3 is set in OFF."
- 4. When it is "destination of comparison > origin of comparison2", comparison result flag3 is set in "ON" and, comparison result flag1, 2 is set in "OFF."

The following figures show the relation between the above-mentioned comparison result flag1, 2, 3.

Big and small relation	Comparison result flag 1	Comparison result flag 2	Comparison result flag 3
Origin of comparison1 > destination of comparison	ON	OFF	OFF
Origin of comparison1 <= destination of comparison and destination of comparison <= Origin of comparison2	OFF	ON	OFF
Destination of comparison > Origin of comparison2	OFF	OFF	ON

<< FLEX-PC N >>

Seizing Signal

I] [[DZCP	S1	S2	S]-

S1: Origin of comparison1

S2: Origin of comparison2

S : Destination of comparison

↓

<<Call processing when making to FB with SX-Programmer Standard>>

	USERFB	DZCP	0	
DMO	- DV1 IN1			
DM2	DV2 IN2			
DM4	DV3 IN3			
M100	- V4 IN4		V 4 IN 4	- M100
M200	- V5 I N5		V5 IN5	- M200
M300	- V6 IN6		V6 IN6	. M300

Double Range Comparison Program Alternative

comparis on Addre	COMPARIS			
on Addre	on Addre			on Fla
DV	DV			V
0001	0003			0004
				(.)
				compar on Fla
				v
				0005 (P)
				(K)
				compar on Fla
				v
				0006 (P)
		""		(K)
condition is "Trut	th", the output paramete:	r "vuuus"		
Comparis	Comparis	Comparis	Comparis	Compar
on Addre	on Addre	on Addre	on Addre	on Fla
0001	DV 0003	0003	0002	v 0004
	<=		<u> </u>	(R
	200		8,0	Compan
				on Fla
				v 0005
				(S]
				Compar
				on Fla
				v 0006
				(R
condition is "Trut	th", the output paramete	r "V0006"		
Comparis	Comparis			Compar
on Addre	on Addre			on Fla
DV	DV			V
0003	L			0004 ——(R
				ໂດຫກອງ
				on Fla
				V
	5			0005
				Common
				on Fla
				v
				0006 ۲
	~			(ə
	condition is "Trus On Addre DV 0001 condition is "Trus Comparis on Addre DV 0003	condition is "Truth", the output parameter Comparis Comparis on Addre on Addre DV DV 0001 0003 <pre>Comparis Comparis on Addre on Addre DV DV Comparis Comparis on Addre on Addre DV DV 0003 0002</pre>	condition is "Truth", the output parameter "V0005" Comparis On Addre OV DV DV DV DV 0001 0003 Comparis Comparis On Addre DV Comparis Comparis On Addre DV DV 0003 0002	condition is "Truth", the output parameter "V0005" Comparis Comparis Comparis Comparis on Addre on Addre on Addre on Addre DV DV DV DV DV O001 0003 0002 <=

8Bit Transfer

"8Bit Transfer" instruction is not supported in SX-Programmer Standard. The alternative solution is explained.

- 1. The logical product of the eight high-order bits or the eight low-order bits of origin of transfer is done. * This processing extracts the origin of transfer eight high-order bits or eight low-order bits.
- 2. After the logical product is done, shifts left or right by 8bits.
- The logical product of the eight high-order bits or the eight low-order bits of destination of transfer is done.
 * This processing delete the destination of transfer eight high-order bits or eight low-order bits.
- 4. The logical add to data which did shift processing and destination of transfer is done.
 - * This processing is origin of transfer high rank byte or the eight low-order bits is forwarded to destination of transfer the eight high-order bits or the eight low-order bits.

Example 1) When it is a origin of transfer is the eight high-order bits and destination of transfer is the eight low-order bits

1	Example)l origin of transfer "WMO00001" is a e destination of transfer "WM000003" i	ight hiqh s a eight	-order bits. t low-order bits.		
	only a eight high-order bits of origin of tran extracted.	sfer "WMO	000001" is		
	M 000000		WM 000001		ଷM ୦୦୦୦୦2
2		AND_AU	H0000	$HFF00 \rightarrow$	• НОООО
3	The work area "WM000002" is shifted right by e M 0000000	ight bit:	·	መለ 000002	WM 000002
4			SHR	H0000 8→	• H0000
5	M 000000000000000000000000000000000000	nster	መለ 000003		พห 000003
6		AND AU	H0000	HFF00-	нооо ⊢
7	The work area "WM000002" is transported to the transfer "WM000003".	destinat	tion of		
	м		WМ	WM	ωM
	000000		000002	000003	000003
8		OR AW	H0000	H0000-	• H0000
9			END		

Example 2) When it is a origin of transfer is the eight low-order bits and destination of transfer is the eight high-order bits

1	Example)2 origin of transfer "WMOO	10004" is a eight low-order	bits.		
	destination of transfer	"WM000006" is a eight high	-order bits.		
	only a eight low-order bits of original sectors of a sector of the secto	gin of transfer "WM000004"			
	м		WM		ωM
	000001		000004		000005
2		AND_AU	H0000	$HOOFF \rightarrow$	H0000
	M 000001		រារ បារ	005	ឃM 000005
4		SHL	HC	000 8→	H0000
	M 000001		WM 000006		ឃ M ០០០០០ភ
6		AND AN	H0000		H0000
7	The work area "WM000005" is transp transfer "WM000006".	oorted to the destination o	£		
	M		WM	WM	WM
	080001		000005	000006	000006
8		OR_AW	H0000	$\rm H0000 {\rightarrow}$	H0000
9			END		

Example 3) When it is a origin of transfer is the eight high-order bits and destination of transfer is the eight high-order bits

1	Example)3 origin of transfer "WM000007" is a e destination of transfer "WM000009" i	ight high-or s a eight hi	der bits. gh-order bits.		
	only a eight high-order bits of origin of tran extracted.	sfer "WM00000)7″ is		
	m 000002		WM 000007		WM
2			000007		
4	11	AND_AU	H0000	$HFFOO \rightarrow$	HOOOO
	deleted.	more whoo			-
	M		WM		ωM
	000002		000009		000009
4		AND AU	H0000	$HOOFF \rightarrow$	H0000
5	The work area "WM000008" is transported to the transfer "WM000009".	destination	of		
	м		WM	WM	ωM
	000002	12	000008	000009	000009
6		OR_AW	H0000	${\tt H0000} \rightarrow$	H0000
7		24	END		

Example 4) When it is a origin of transfer is the eight low-order bits and destination of transfer is the eight low-order bits

1	Example)4 origin of transfer "WM00000A" is a	eight low-orde	r bits.		
	destination of transfer "WM00000C"	is a eight low	-order bits.		
	only a eight low-order bits of origin of tran is extracted.	usfer "WM00000A	'n		
	м		UM		ωM
	000003		A00000		00000B
2		AND AU	H0000	$HOOFF \rightarrow$	ноооо
	"WM000000" is deleted. M 000003		WM 00000C		ଭM 00000C
4		AND AW	H0000	HFF00→	ноооо
5	The work area "WM00000B" is transported to th transfer "WM00000C".	ne destination	of		
	м		WM	WM	ωM
	000003		00000B	00000C	00000C
6] [OR_AW	H0000	$\rm H0000 {\rightarrow}$	ноооо
7			END		

Digit Transfer

"Digit Transfer" instruction is not supported in SX-Programmer Standard. The alternative solution is explained.

- The logical product is done to digit of data which transfer a origin of transfer.
 * This processing extracts necessary data from digit of the transfer data.
- 2. Right or left shifts to digit where data which did the logical product is transfer
- 3. The logical product is done to destination of transfer digit in the destination of transfer * This processing delete destination of transfer digit.
- 4. The logical add to data which did shift processing and destination of transfer is done.
 * This processing is forwarded to specified digit in the destination of transfer.

Example 1) The first digit from the third digit transfer from origin of transfer to the first digit of the destination of transfer

1	Example)1 The first digit from the third digit transfer from origin of transfer "WM first digit(unit of four bits) of th transfer "WM000003". The first digit from the third digit is	(unit of four 000001" to th e destination	bits) e of		
	extracted from origin of transfer "WM000001".				
	M 000001		መ ዝ 000001		₩M 000002
2		AND AU	H0000	$H0F00 \rightarrow$	ноооо
3	The work area "WM000002" is shifted right by e M 000001	ight bits.	ឃM 0000	02	መ ዝ 000002
4		SHR	HO		ноооо
5	The first digit of the destination of transfer deleted. M 000001	: "WMOOOOO3" i;	s WM 000003		መ ዝ 000003
6		AND AU	H0000	$HFFFO \rightarrow$	ноооо
7	The work area "WM000002" is transported to the transfer "WM000003".	destination	of		
	M		WM	UM	WM
	000001	12.	000002	000003	000003
8		OR_AW	H0000	$\rm H0000 \rightarrow$	ноооо
9			END		

Example 2) Two digits from the second digit transfer from origin of transfer to the fourth digit of the destination of transfer

1	Example)2 Two digits from the second digit(u transfer from origin of transfer " fourth digit(unit of four bits) of transfer "WM000007".	nit of four bit WM000005" to th the destinatio	s) e n of		
	Two digits from the second digit are extract transfer "WM000005".	ed from origin	of		
	74		LTM		LIM
	000002		000005		000006
2		AND AW	H0000	$HOFFO \rightarrow$	ноооо
3	Ine work area "wmuuuuuuu" is shifted left by M 000002	Iour bits.	መ ጀ 0000	06	ឃ ។ ០០០០០៩
4			HO	00 100 4→	HOUDD
5	"WM0000007" are deleted. M 000002	or craister	WM 000007		መ ዝ 000007
6		AND AW	H0000	HOOFF→	HOOOO
7	The work area "WM000006" is transported to t transfer "WM000007".	he destination	of		
	м		WM	WM	WM
	000002		000006	000007	000007
8		OR_AW	H0000	$\rm H0000 \rightarrow$	Н0000
9		90 			
-			LMD]

Rotate Right Carry n

"Rotate Right Carry n" instruction is not supported in SX-Programmer Standard. The alternative solution is explained.

- 1. "Rotation data" is stored in "Temporary."
- 2. The 0th bit of "Temporary" is stored in "Carry flag."
- 3. "Temporary" is shifted right by 1 bit.
- 4. When "Carry flag" is "ON," the 16th bit of "Temporary" is turned on.
- 5. When "Carry flag" is "OFF," the 16th bit of "Temporary" is turned off.
- 6. Processing 2-5 is repeated the number of times of "No. of rotate bits."
- 7. Data which did the shift processing is stored in "Rotation data" again.

<< FLEX-PC N >>

Conditional contact

|--][-----[NRCR D , n]-|

- D : Device in which data is to be rotated
- n : A number of bits by which data is to be rotated

USERFB NRCR 0 Μ1 ٧1 IN1 DM2 DV2 IN2 WМЗ ₩¥3 ₩¥3 ₩MЗ IN3 IN3 ₩4 ٧4 ٧4 M4 IN4 IN4

<<Call processing when making to FB with SX-Programmer Standard>>

[Variable Explanation] DF000A: Temporary

Rotate Right Carry n Program Alternative

The data is stored in Temporary.				
Conditio			Rotation	Temporar
nal			data	У
V			WV	WF
0001			0003	A000
		MOVE	\rightarrow	0 2
repeats for No. of rotate bits.				
Conditio				No of ro
nal				tate bit
V				DV
0001				0002
			LOOP	
The carry flag is output.				
			T	C
rel			Temporar	carry r.
W			र माग	ay V
0001				0004
		TBIT)→
shifts right.				
Conditio		Temporar		Tempora
nal		У		У
V		DF		DF
0001		A000		A000
	SHR		$1 \rightarrow$	
Conditio Carry fl nal ag V V Secol		Temporar Y DF		Temporar Y DF
		A000		A000
	SBIT		$16 \rightarrow$	
When the carry flag is turning OFF, The	16th bit is turned off.			
Conditio Carry fl		Temporar		Tempora
nal aq		v		v
V V		DF		DF
0001 0004		A000		A000
	RBIT		$16 \rightarrow$	
			CONT	
			66	
Data which ends the shift processing is	stored in the parameter.			
Conditio			Temporar	Rotatio:
nal			У	data
V			WF	WV
0001			000A	0003
		MOVE	\rightarrow	
		END		

Rotate Left Carry n

"Rotate Left Carry n" instruction is not supported in SX-Programmer Standard. The alternative solution is explained.

- 1. "Rotation data" is stored in "Temporary."
- 2. SLC instruction is done to "Temporary."
- 3. The 16th bit of "Temporary" is stored in "Carry flag."
- 4. Processing 2-3 is repeated the number of times of "No. of rotate bits."
- 5. Data which did the shift processing is stored in "Rotation data" again.

<<FLEX-PC N>>

Conditional contact

|--][-----[NRCL D , n]-|

D : Device in which data is to be rotated

n : A number of bits by which data is to be rotated

<<Call processing when making to FB with SX-Programmer Standard>>



[Variable Explanation] DM000A: Temporary

Rotate Left Carry n Program Alternative

1	The rotate data is stored in Temporary.						
	Conditio				Rotation		
	nal				data		
	V				WV		UM
	0001				0003		A00000
2			MOVE		-	÷	0
3	repeats for No. of rotate bits.						
	Conditio						No of ro
	nal						tate bit
	V						DV
	0001						0002
4					LOOP		
5	shifts left.						,
	Conditio			Temporar	Carry fl		Temporar
	nal			v	ag		v
	V			DM	v		DM
	0001			A00000	0004		A00000
6		SLC		H00000000	1	> F	100000000
7	The carry flag is output.						
	Conditio				Temporar		Carry fl
	nal				У		ag
	V				DM		V
			2		A00000		0004
8			TBIT	H	00000000	16-	<u>} </u> ٢
9						CONT	
10	Data which ends the shift processing is stored in the pa	arameter.					
	Conditio						Rotation
	nal						data
	V				WM		WV
	0001				A00000		0003
11			MOVE		0-	÷	
12			END				

Double Rotate Right Carry n

"Double Rotate Right Carry n" instruction is not supported in SX-Programmer Standard. The alternative solution is explained.

- 1. "Rotation data" is stored in "Temporary1."
- 2. SRC instruction is done to "Temporary1," and it is output to "Temporary2."
- 3. "Carry flag" of "Temporary1" is output.
- 4. "Temporary2" is stored in "Temporary1."
- 5. Processing 2-4 is repeated the number of times of "No. of rotate bits."
- 6. Data which did the shift processing is stored in "Rotation data" again.
- <<FLEX-PC N>>

Conditional contact

|--][------[DNRCR D n]-|

- D : Device in which data is to be rotated
- n : A number of bits by which data is to be rotated
 - \downarrow

<<Call processing when making to FB with SX-Programmer Standard>>



[Variable Explanation] DF000A: Temporary DF000C: Temporary
Double Rotate Right Carry n Program Alternative

1	The data is stored in Temporary.					
	Conditio			Rotation		Temporar
	nal			t data		v
	V			DV		DF
	0001			0002		000A
2		MOVE				ŀ
3	repeats for No. of rotate bits.	11			2	
	Conditio					No of ro
	nal					tate bit
	V					DV
	0001					0003
4				LOOP		
5	shifts right.					
-						
	Conditio		Temporar	Carry fl		Temporar
	nal		У	ag		Y
	V		DF	V		DF
	0001		A000	0004		000C
6		SRC .		\rightarrow	0	
7	The carry flag is output.					
	Conditio				Temporar	Carry fl
	nal				v	ag
	V				DF	v
	0001				000A	0004
8			SRCO			
9	Data which did the shift processing is made the latest da	ita.				
	Conditio			Temporar		Temporar
	nal			v		v
	V			DF		DF
	0001			0000		A000
10		MOVE			9	
	85.15				3]
11					CONT	— н
10					CONT	
12	Data which ends the shift processing is stored in the pai	ameter.				
	Conditio			Temporar		Rotation
	nal			v		t data
	V			י קע		DV
	0001			A000		0002
13		WOVE			8	
		1041				
14		END				

Double Rotate Left Carry n

"Double Rotate Left Carry n" instruction is not supported in SX-Programmer Standard. The alternative solution is explained.

- 1. "Rotation data" is stored in "Temporary1."
- 2. SLC instruction is done to "Temporary1," and it is output to "Temporary2."
- 3. "Carry flag" of "Temporary1" is output.
- 4. "Temporary22 is stored in "Temporary1."
- 5. Processing 2-4 is repeated the number of times of "No. of rotate bits."
- 6. Data which did the shift processing is stored in "Rotation data" again.

<<FLEX-PC N>>

Conditional contact

|--][-----[DNRCL D n]-|

- D : Device in which data is to be rotated
- n : A number of bits by which data is to be rotated

<<Call processing when making to FB with SX-Programmer Standard>>



[Variable Explanation] DF000A: Temporary DF000C: Temporary

Double Rotate Left Carry n Program Alternative

1	The data is stored in Temporary.						
	Conditio				Rotation		Temporar
	nal				data		v
	V				DV		DF
	0001				0002		A000
2			MOVE		\rightarrow		
3	repeats for No. of rotate bits.					6	
	Conditio						No of ro
	nal						tate bit
	V						DV
10.22	0001						0003
4					LOOP		
5	shifts left.						
	Conditio			Temporar	Carry fl		Temporar
	nal			У	ag		У
	V			DF	V		DF
	0001			A000	0004		000C
6	s de la companya de l	LC			\rightarrow	6	
7	The carry flag is output.						
	Conditio					Temporar	Carry fl
	nal					v	ag
	V					DF	V
	0001					A000	0004
8				SLCO			H
9	Data which did the shift processing is made the latest da	ita.					
	Conditio				Temporar		Temporar
	nal				y		y
	V				DF		DF
	0001				000C		A000
10			MOVE		\rightarrow		
11	C	500				CONT	
12	Data which ends the shift processing is stored in the par	ameter.					
	Conditio				Temporar		Rotation
	nal				У		data
	V				DF		DV
	0001		8		A000		0002
13			MOVE		\rightarrow		
14			END				

Step Control

"Step Control" instruction is not supported in SX-Programmer Standard. The alternative solution is explained.

"Step Control" instruction is achieved by "S" device in SX-Programmer Standard.

The group number and the step number which wants to control are set to "S" device of the step control instruction.

Step Control Program Alternative



Real Comparison

"Real Comparison" instruction is not supported in SX-Programmer Standard. The alternative solution is explained.

- 1. New program(FB) is made, and the input parameter(origin of comparison, destination of comparison) I/O parameter (comparison result flag1,2) is set.
- 2. When it is "origin of comparison > destination of comparison," comparison result flag1 and comparison result flag2 are set in "OFF."
- 3. When it is "origin of comparison = destination of comparison," comparison result flag1 is set in "ON" and, comparison result flag2 is set in "OFF."
- 4. When it is "origin of comparison < destination of comparison," comparison result flag1 is set in "OFF" and, comparison result flag2 is set in "ON."

The following figures show the relation between the above-mentioned comparison result flag1, 2.

Big and small relation	Comparison result flag1	Comparison result flag2
Origin of comparison > destination of comparison	OFF	OFF
Origin of comparison = destination of comparison	ON	OFF
Origin of comparison < destination of comparison	OFF	ON

<<FLEX-PC N>>

Seizing signal			
][[ECMP	S1	S2]-[

S1 : Origin of comparison

S2 : Destination of comparison

<<Call processing when making to FB with SX-Programmer Standard>>

	USERFB	ECMP	0	
DMO	DV1 IN1			
DM4	DV2 IN2			
M10	V3 IN3		V3 IN3	- M10
M20	V4 IN4		V4 IN4	- M2O

Real Comparison Program Alternative

International Comparits Comparits </th <th>1</th> <th>When relation of and "V0004" are</th> <th>condition is "Trut made "OFF".</th> <th>h", the output</th> <th>parameter "V0003"</th> <th></th>	1	When relation of and "V0004" are	condition is "Trut made "OFF".	h", the output	parameter "V0003"	
on Addre on Addre on Plag DY DY V 0001 0002 0003 R> Comparis Comparis 0004 (R) (R) 0005 (R) (R) 0006 (R) (R) 0001 0002 (R) 0004 (R) (R) 0005 (R) (R) 15 made "ON". Comparis Comparis Comparis Comparis 0001 0002 0003 0001 0002 0003 0001 0002 0003 0004 (R) (R) 15 made "ON". Comparis Comparis Comparis Comparis 0004 (R) (R) 15 made "ON". Comparis 0001 0002 0003 0001 0002 0003 0001 0002 0003 0001 000			Comparis	Comparis		Comparis
PV PV PV 0001 0002 0003 2 R> (R) Comparis 3 When relation condition is "Truth", the output parameter "V0003" (R) (R) 3 When relation condition is "Truth", the output parameter "V0003" (R) (R) 4 Comparis Comparis Comparis 0001 0002 0003 0003 4 R= (S) (S) 5 When relation condition is "Truth", the output parameter "V0004" (R) (R) 5 When relation condition is "Truth", the output parameter "V0004" (R) (R) 5 When relation condition is "Truth", the output parameter "V0004" (R) (R) 6 R Comparis Comparis Comparis 6 R (R) (R) (R) 6 R (R) (R) (R) 7 EMD (S) (S)			on Addre	on Addre		on Flag
2 0001 0002 0003 2 R> Comparis Comparis 3 When relation condition is "Truth", the output parameter "V0003" (R) (R) 3 Uhen relation condition is "Truth", the output parameter "V0003" (R) (R) 4 Comparis Comparis Comparis Comparis 0001 0002 0003 0003 4 R= (S) Comparis Comparis 0001 0002 0003 (R) 5 When relation condition is "Truth", the output parameter "V0004" (R) (R) 5 When relation condition is "Truth", the output parameter "V0004" (R) (R) 6 R Comparis Comparis Comparis 0001 0002 0003 0003 (G) 6 R (R) (R) (R) 0001 0002 0003 (G) (S) 0001 0002 0003 (G) (G) 0001 0002			DV	DV		v
2 R> 0001 0002 (R) 3 When relation condition is "Truth", the output parameter "V0003" (R) (R) 3 When relation condition is "Truth", the output parameter "V0003" (R) (R) 3 When relation condition is "Truth", the output parameter "V0003" (R) (R) 4 Comparis Comparis on Flag 0 0001 0002 0003 4 R= (S) (Comparis) 5 When relation condition is "Truth", the output parameter "V0004" (R) 5 When relation condition is "Truth", the output parameter "V0004" (R) 6 R Comparis Comparis 0001 0002 0003 (R) 0001 0002 0003 (R) 6 R Comparis Comparis 0001 0002 003 (R) 0001 0002 003 (R) 7 END K K			0001	0002		, , ,
7 2 PS (R) Comparis Comparis 0004 (R) 3 When relation condition is "Truth", the output parameter "V0003" is made "ON". 3 Comparis Comparis 0 Addre on Flag 0 0001 0002 4 C (S) 7 Comparis Comparis 0 0002 0003 (R) 0004 (R) 5 When relation condition is "Truth", the output parameter "V0004" (R) 5 When relation condition is "Truth", the output parameter "V0004" (R) 6 Comparis Comparis 0001 0002 0003 001 0002 0003 (R) Comparis Comparis 0001 0002 0003 6 R Comparis 0001 0002 0003 (S) (S) (S) 0004 (S) (S)	~		0001			(P)
7 EXD Comparis Comparis on Flag V 0004 (R) 8 When relation condition is "Truth", the output parameter "V0003" is made "ON". Comparis Comparis On Addre ON Addre ON O002 (Comparis On Plag V V 0001 0002 (Comparis On Plag V V 0004 (R) 9 When relation condition is "Truth", the output parameter "V0004" (R) 9 When relation condition is "Truth", the output parameter "V0004" (R) 9 When relation condition is "Truth", the output parameter "V0004" (R) 9 When relation condition is "Truth", the output parameter "V0004" (R) 9 Comparis Comparis Comparis On Plag V V 0004 (R) 9 Comparis Comparis Comparis On Plag V V 0001 0002 (R) 9 Comparis Comparis On Plag V V 0004 (R) 9 O001 0002 (R)	4	R>				(K)
3 When relation condition is "Truth", the output parameter "V0003" is made "ON". Comparis On Addre DV Comparis On Addre DV Comparis On Addre DV 4 R= (S)- Comparis On Plag 5 When relation condition is "Truth", the output parameter "V0004" is made "ON". Comparis On Addre Output 5 When relation condition is "Truth", the output parameter "V0004" is made "ON". Comparis On Addre Output 6 R (R)- (R)- (R)- (R)- (R)- (R)- (R)- (R)-						Comparis
3 When relation condition is "Truth", the output parameter "V0003" is made "ON". Comparis Comp						on Flag
3 When relation condition is "Truth", the output parameter "V0003" is made "ON". Comparis on Addre bv Comparis on Addre bv Comparis on Flag v 4 R= (S) 5 When relation condition is "Truth", the output parameter "V0004" is made "ON". Comparis on Addre v 5 When relation condition is "Truth", the output parameter "V0004" is made "ON". Comparis on Addre v 6 R (R) 7 END Comparis on Flag v						V
3 When relation condition is "Truth", the output parameter "V0003" is made "ON". Comparis Comparis Comparis ON03 4 R= (S) 6 Comparis Comparis Comparis Comparis ON04 Comparis Comparis ON04 7 END						0004
When relation condition is "Truth", the output parameter "V0003" is made "ON". Comparis on Addre DV DV DV DV DV DV O001 0002 Comparis on Flag V Nhen relation condition is "Truth", the output parameter "V0004" is made "ON". Comparis On Addre DV DV DV DV DV DV DV DV DV DV DV DV DV				, l		(R)
Comparis Comparis Comparis Comparis on Flag DV DV DV 0001 0002 0003 003 4 R= (S)	3	When relation of the second se	condition is "Trut	ch", the output	parameter "VOOO3"	
on Addre on Addre on Addre on Flag DV DV V 0003 0004 (R) S When relation condition is "Truth", the output parameter "V0004" is made "ON". Comparis Comparis Comparis on Flag V 0004 (R) S S When relation condition is "Truth", the output parameter "V0004" is made "ON". Comparis Comparis On Flag V			Comparis	Comparis		Comparis
DV DV V 0001 0002 0003 4 R= Comparis 5 When relation condition is "Truth", the output parameter "V0004" (R) 5 When relation condition is "Truth", the output parameter "V0004" (R) 6 Comparis Comparis 0001 0002 0003 6 R (R) 7 END END			on Addre	on Addre		on Flag
4 R= (3) 8 Comparis Comparis 0001 0002 0003 9 0004 (R) 5 When relation condition is "Truth", the output parameter "V0004" (R) 5 Comparis Comparis 0001 0002 0003 6 R (R) 7 END END			DV	DV		v
4 R= (S) (S) Comparis on Flag V 5 When relation condition is "Truth", the output parameter "V0004" is made "ON". (R) 5 Comparis Comparis on Addre 0 Addre On Flag V DV DV DV DV 0001 0002 6 R 7 END			0001	0002		0003
7 R Comparis 0004 (R) 5 When relation condition is "Truth", the output parameter "V0004" is made "ON". Comparis Comparis Comparis 0 Addre on Addre 0 Addre on Plag DV DV 0001 0002 6 R 7 END	Δ	-n_		h		(\$)
7 Comparis on Flag V When relation condition is "Truth", the output parameter "V0004" (R) S When relation condition is "Truth", the output parameter "V0004" (R) Comparis Comparis on Addre on Addre on Addre on Addre on Addre on O002 6 R 7 END	۰. ۱	R-				
7 on Flag 0004 0004 0004 0004 0004 (R) 0004 (R) 0004 0004 0004 (R) 0001 0002 0004 (R) 0001 0002 0004 (R) 0001 0002 0004 (R) 0004 (R) 0005 (R) 0006 (R) 0007 (R) 0008 (R) 0009 (R) 00001 0002 0004 (S)						Comparis
When relation condition is "Truth", the output parameter "V0004" (R) 5 When relation condition is "Truth", the output parameter "V0004" is made "ON". Comparis Comparis 6 Comparis Comparis Comparis 0001 0002 0003 6 R (R) 7 END END						on Flag
5 When relation condition is "Truth", the output parameter "V0004" (R) 5 Comparis Comparis 0 Omparis Comparis 0 Addre on Addre 0 DV DV 0 0001 0002 6 R Comparis 7 END						V
7 END						0004
5 When relation condition is "Truth", the output parameter "V0004" is made "ON". Comparis Comparis Comparis on Addre on Addre on Plag DV DV V 0001 0002 0003 6 R 6 R 7 END				2L		(R)
Comparis Comparis Comparis Comparis On Addre On Addre On Addre On Flag DV DV V 0001 0002 Comparis On Flag V 0004 (S)	5	When relation of is made "ON".	condition is "Trut	th", the output	parameter "V0004"	
on Addre on Addre on Flag DV DV V 0001 0002 0003 6 R (R) Comparis on Flag V 0004 (S) (S)			Comparis	Comparis		Comparis
6			on Addre	on Addre		on Flag
6 0001 0002 0003 (R) Comparis on Flag V 0004 (S) 7 END			DV	DV		v
6 R< Comparis O004 (S) 7 END (Comparis) (Com			0001	0002		0003
7 END Comparis Comparis OO04 (S)	6	R<		h		(R)
7 END		2.42				Comparia
7 END						comparis on Flor
7 END END						on riag
7 END						V
7END						0004 («)
7 END				10		(2)
7 END						
7 END						
7 END						
7 END						
	7				END	
		l				

Real Range Comparison

"Real Range Comparison" instruction is not supported in SX-Programmer Standard. The alternative solution is explained.

- 1. New program(FB) is made, and the input parameter(origin of comparison1, 2, destination of comparison) I/O parameter (comparison result flag1, 2, 3) is set.
- 2. When it is "origin of comparison1 > destination of comparison," comparison result flag1 is set in "ON" and, comparison result flag2, 3 is set in "OFF."
- 3. When it is "origin of comparison1 <= destination of comparison," and "destination of comparison <= origin of comparison2," comparison result flag1, 3 is set in "OFF."
- 4. When it is "destination of comparison > origin of comparison2," comparison result flag3 is set in "ON" and, comparison result flag1, 2 is set in OFF."

The following figures show the relation between the above-mentioned comparison result flag1, 2.

Big and small relation	Comparison result flag 1	Comparison result flag 2	Comparison result flag 3	
Origin of comparison1 > destination of comparison	ON	OFF	OFF	
Origin of comparison1 <= destination of comparison and destination of comparison <= Origin of comparison2	OFF	ON	OFF	
Destination of comparison > Origin of comparison2	OFF	OFF	ON	

<<FLEX-PC N>>

Seizing signal

][[EZCP	S1	S2	S]-

S1 : Origin of comparison1

S2 : Origin of comparison2

S : Destination of comparison

<<Call processing when making to FB with SX-Programmer Standard>>

	USERFB	EZCMP	0	
DMO	DV1 IN1			
DM2	DV2 IN2			
DM4	DV3 IN3			
M100	- V4 IN4		V 4 IN 4	- M100
M200	- V5 IN5		V5 IN5	- M200
M300	- V6 IN6		V6 IN6	- M300

Real Range Comparison Program Alternative

1	When relation	condition is "Trut	h", the output	parameter "V0004"			
		Comparis	Comparis				Comparis
		on Addre	on Addre				on Flag
		DV 0001	DV 0003				¥ 0004
2	10	0001	h				(S)
							Commaris
							on Flag
							V
							0005 (R)
							Comparis
							on Flag V
							0006
							——(R)—
3	When relation is made "ON".	condition is "Trut	h", the output	parameter "V0005"			
		Comparis	Comparis		Comparis	Comparis	Comparis
		on Addre	on Addre		on Addre	on Addre	on Flag
		0001	0003		0003	0002	0004
4	R<=			R<=		<u> </u>	(R)
							Comparis
							on Flag
							V 0005
							(S)
							Commaria
							on Flag
							V
							0006 (P)
-							(
5	When relation is made "ON".	condition is "Trut	n", the output	; parameter "VUUU6"			
		Comparis	Comparis				Comparis
		on Addre	on Addre				on Flag
		DV 0003	0002				V 0004
6	R>		h	c			(R)
							Comparis
							on Flag
							V
							0005
							Comparia
							on Flag
							v
							0006
							(۲)
							54.
7					END		
							210

Time Comparison

"Time Comparison" instruction is not supported in SX-Programmer Standard. The alternative solution is explained.

- 1. New program(FB) is made, and the input parameter(origin of comparison(Hour, Minute, Second), destination of comparison (Hour, Minute, Second)) I/O parameter(comparison result flag1, 2) is set.
- 2. When it is "origin of comparison(Hour) > destination of comparison(Hour)," comparison result flag1 and comparison result flag2 are set in "OFF."
- 3. When it is "destination of comparison(Hour) > origin of comparison(Hour)," comparison result flag2 is set in "ON" and, comparison result flag1 is set in "OFF."
- 4. It is set that result1 of the comparison between "origin of comparison(Minute)" and "destination of comparison(Minute)" at "origin of comparison(Hour) = destination of comparison(Hour)" referring to processing1, 2. And it is set that result1 of the comparison between "origin of comparison(Second)" and "destination of comparison(Second)" at "origin of comparison(Minute) = destination of comparison(Minute)" referring to processing1, 2. As a result, when it is "origin of comparison(Hour, Minute, Second) = destination of comparison(Hour, Minute, Second)", comparison result flag1 is made "ON", and comparison result flag2 is made "OFF."

The following figures show the relation between the above-mentioned comparison result flag1, 2.

Big and small relation	Comparison result flag1	Comparison result flag2
Origin of comparison > destination of comparison	OFF	OFF
Origin of comparison = destination of comparison	ON	OFF
Origin of comparison < destination of comparison	OFF	ON

<<FLEX-PC N>>

Seizing signal

0 0					
] [[TCMP	S1	S2	S3	S]-

S1 : Origin of comparison (Hour)

S2 : Origin of comparison (Minute)

S3 : Origin of comparison (Second)

S : Destination of comparison

<<Call processing when making to FB with SX-Programmer Standard>>

	USERFB	TCMP	0	
WMO	- WV1 IN1			
₩M1	- ₩¥2 IN2			
₩M2	- ₩V3 IN3			
AW3	- ¥¥4 IN4			
₩₩4	₩¥5 IN5			
₩₩5	- ₩¥6 IN6			
M10	- ¥7 IN7		V7 IN7	- M10
M20	- V8 IN8		V8 IN8	- M2O

Time Comparison Program Alternative



Appendix 7 Alternative Proposal





Time Range Comparison

"Time Range Comparison" instruction is not supported in SX-Programmer Standard. The alternative solution is explained.

- 1. New program(FB) is made, and the input parameter(origin of comparison1- 1, 2, 3(Hour, Minute, Second), origin of comparison2- 1, 2, 3(Hour, Minute, Second), destination of comparison(Hour, Minute, Second)) I/O parameter(comparison result flag1, 2, 3, 4) is set.
- 2. Comparison result flag1 is set in "OFF."
- 3. Comparison result flag2 is set in "OFF."
- 4. Comparison result flag3 is set in "OFF."
- 5. Comparison result flag4 is set in "OFF."
- 6. When it is "origin of comparison1- 1(Hour) > destination of comparison2- 1(Hour)," comparison result flag1 is set in "ON."
- 7. When it is "origin of comparison1- 1(Hour) = origin of comparison2- 1(Hour)" and "origin of comparison1- 2(Minute) > origin of comparison2- 1(Minute)," comparison result flag1 is set in "ON." And when it is "origin of comparison1- 2(Minute) = origin of comparison2- 2(Minute)," "origin of comparison1- 3(Second) > origin of comparison2- 3(Second)" is compared. When the result is "True," comparison result flag1 is made "ON."
- 8. When comparison result flag1 is "ON," FB is ended.
- 9. When it is "origin of comparison1- 1(Hour) > destination of comparison(Hour)," comparison result flag2 is set in "ON."
- 10. When it is "origin of comparison1- 1(Hour) = destination of comparison(Hour)" and "origin of comparison1- 2(Minute) > destination of comparison(Minute)," comparison result flag1 is set in "ON." And when it is "origin of comparison1- 2(Minute) = destination of comparison(Minute)," "origin of comparison1- 3(Second) > destination of comparison(Second)" is compared. When the result is "True," comparison result flag2 is made "ON."
- 11. When comparison result flag2 is "ON," FB is ended.
- 12. When it is "destination of comparison(Hour) > origin of comparison2- 1(Hour)," comparison result flag3 is set in "ON."
- 13. When it is "destination of comparison(Hour) = origin of comparison2- 1(Hour)" and "destination of comparison(Minute) > origin of comparison2- 2(Minute)," comparison result flag3 is set in "ON". And when it is "destination of comparison(Minute) = origin of comparison2- 2(Minute)," "destination of comparison(Second) > origin of comparison2- 3(Second)" is compared. When the result is "True", comparison result flag3 is made "ON."
- 14. When comparison result flag3 is "ON," FB is ended.
- 15. Comparison result flag4 is set in "ON" * Comparison result flag1, 2, 3 becomes "OFF" it and " origin of comparison1(Hour, Minute, Second) <= destination of comparison(Hour, Minute, Second) <= origin of comparison2(Hour, Minute, Second)" because of current processing.</p>

Comparison Comparison Comparison Comparison **Big and small relation** result flag1 result flag2 result flag3 result flag4 Origin of comparison1(Hour, Minute, Second) > origin ON OFF OFF OFF of comparison2(Hour, Minute, Second) Origin of comparison1(Hour, Minute, Second) > OFF ON OFF OFF destination of comparison(Hour, Minute, Second) Origin of comparison1(Hour, Minute, Second) OFF OFF ON OFF <=destination of comparison(Hour, Minute, Second) <=origin of comparison2(Hour, Minute, Second) destination of comparison (Hour, Minute, Second) > ON OFF OFF OFF origin of comparison2(Hour, Minute, Second)

The following figures show the relation between the above-mentioned comparison result flag1, 2, 3, 4.

<<FLEX-PC N>>

Seizing signal

][[TZCP	S1	S2	S]-[
-----	------	----	----	---	-----

S1 : Origin of comparison1 (Hour, Minute, Second)

S2 : Origin of comparison2 (Hour, Minute, Second)

S : Destination of comparison (Hour, Minute, Second)

 \downarrow

<<Call processing when making to FB with SX-Programmer Standard>>

	USERFB	TZCMP	0	
WMO	- \\\ IN1			
₩M1	- ₩¥2 IN2			
₩M2	₩V3 IN3			
WM3	₩V4 IN4			
₩M4	₩V5 IN5			
₩M5	WV6 IN6			
₩M6	₩V7 IN7			
₩M7	₩V8 IN8			
WM8	₩V9 IN9			
M100	V10 IN10		V10- IN10	M100
M200	V11 IN11		V11 IN11	M200
M300	V12 IN12		V12- IN12	M300

Time Range Comparison Program Alternative

1	The I/O parameter"VOOOA" is initialized.	
		Comparis
		on Flag
		V
	ON	A000
2		(R)
~	The I/O permeter/WOODP/ is initialized	
3	The 1/0 parameter woods is initialized.	Commeria
		on Flag
		v v
	01	000B
А		(B)
-		
5	The I/O parameter"VOOOC" is initialized.	
		Comparis
		on Flag
		V
3 <u>2</u> 3	100 J	000C
6		(R)
7	The I/O parameter"VOOOD" is initialized.	
	0020104882 040062010404 40010 4001040 - 000042002004044	Comparis
		on Flag
		V
	ON	000D
8		(R)
9	Hour is compared, and when the comparison result is "Truth", the	
	comparison result riag is turned on.	Comparia
	Ноци	comparis on Flog
		on riag
		000A
10		(<)
10	>	(2)

Appendix 7 Alternative Proposal



Appendix 7 Alternative Proposal

255			22					Comparis
	Ho	ur	Hour					on Flag v
	00	107	0004					, 000C
22 5]				(S)
23 Ho co	our is compared, and omparison result fla	d when the compa ag is turned on.	nrison re	sult is "Truth"	, the			
	Ho	ur	Hour		Minute	Minute		
	WA	,	WV		WV	MA		
	00	107	0004	1	0008	0005		> 1
²⁴ [=				_∏≥				
					Minuto	Minuto		
					WV	MAURICE		
					0008	0005		
				4=				→ 2
								Comparis
								on Flag
								V
1								(S)
~								Comporie
		Second		Second				on Flag
		WV		WV				V
		0009		0006				000C
2	>>							(S)
5 Th co tu Coi	he minute are compan Mapared when the min Marned on. Maaris	red when hour is nute is the same	the sam and com	e and seconds a parison result	re flag is			
on	Flag							
	oc							
6	- i E						MPC	P00000
7 77	e comparison result	t flag is turned	l on.			Ľ		
· · · ·	ie comparison repart	o ridy ib ourned						Comparis
								on Flag
1000	9							V
								(ເັ
°] [(~)
9 -						J	END	P00000
						-		
					EIE			
0					END			Г

Some instructions which can not be pasted

When the connection and comparison instructions are included in a ladder line where the following instructions are included and for a parallel output, the instructions are not pasted.

- Increment on Rising Edge (INCP)
- Double Increment on Rising Edge (DINCP)
- Decrement on Rising Edge (DECP)
- Double Decrement on Rising Edge (DDECP)
- Output rising differential (PLS)
- Output falling differential (PLF)
- Transfer Message (MSGT)
- Receive Message (MSGR)
- Stores a file (FFST)
- First-in first-out control (FIFO)
- First-in last-out control (FILO)
- Pulse Train Output 1 (PLS1)
- Double Pulse Train Output 1 (DPLS1)
- Pulse Train Output 2 (PLS2)
- Double Pulse Train Output 2 (DPLS2)
- Pulse Width Modulation 1 (PWM1)
- Pulse Width Modulation 2 (PWM2)

When it is possible to paste it, it replaces with the following instructions. Please edit the program referring to this.

Note: The operation execution result might be different from the original Line's. So modify the pasted line referring to the original line.

FLEX-PC	MICREX-SX
Increment on Rising Edge (INCP)	Addition
Double Increment on Rising Edge (DINCP)	Addition
Decrement on Rising Edge (DECP)	Subtraction
Double Decrement on Rising Edge (DDECP)	Subtraction
Output rising differential (PLS)	Rising edge trigger
Output falling differential (PLF)	Falling edge trigger
Transfer Message (MSGT)	Send message
Receive Message (MSGR)	Receive message
Stores a file (FFST)	Sequential file store
First-in first-out control (FIFO)	Sequential file load first
First-in last-out control (FILO)	Sequential file load last
Pulse Train Output 1 (PLS1)	Pulse output
Double Pulse Train Output 1 (DPLS1)	Pulse output
Pulse Train Output 2 (PLS2)	Pulse output
Double Pulse Train Output 2 (DPLS2)	Pulse output
Pulse Width Modulation 1 (PWM1)	Pulse output
Pulse Width Modulation 2 (PWM2)	Pulse output

Please refer to the following examples.

[Example of pasting the Increment on Rising Edge]

[FLEX-PC]



[MICREX-SX]

M	WM		₩M
000000	000009		000009
ADD ADD	0	1→	0

[Example of pasting the Output rising differential]

[FLEX-PC]

M0001
M0010 (↑)
M0020

[MICREX-SX]

The case of using M000030 as a start signal.



Instruction without alternative method (FLEX-PC)

There is not an alternative method of the following instructions.

- HEX to ASCII (ASCI)
- ASCII to HEX (HEX)
- Convert to Secs (SEC)
- Convert to HMS (HMS)
- Option Init (OPDF)
- Data instruction (DATAB, DATAM)
- Status set/reset (SLT, SLTR)
- Trace set/reset (STRA, STRAR)
- Real Bin to Decimal (EBCD)
- Real Decimal to Bin (EBIN)
- Read Time/Write Time (TRD, TWR)
- Pulse Train Output I (PLSI, DPLSI)
- Pulse Train Output A (PLSA, DPLSA)
- Zero Return (ORG, DORG)
- Ramp Output (RAMP)
- PID Calculation (PID)
- Manipulates the bit data (ABSD, INCD)
- Matrix Read (MTR)
- Digital Switch (DSW)
- 7 Segment Displays (SEGL)
- SFC instructions

In the "Project View" window, the entire SX project is structured and displayed. This section explains each item displayed in the Project View window.



Project:

This is the parent folder of a project. The name of a currently opened project is displayed.

System Definition:

When you click this, the system definition screen opens. For more details, refer to "Section 3 System Definition."

Resource:

The is the CPU module. When you right-click this, you can make settings about conversion. For more details, refer to "Appendix 8-1 Resource."

Programs:

This is the parent folder of programs. Register tasks directly under this folder.

Default:

This is the folder for the default task. Programs assigned under this folder (ladder0 in the above figure) are cyclically executed. Fixed:

This is the folder for the periodic task. Programs assigned under this folder are executed at a specified period. Right-click this and then select "Properties" to set the cycle and priority.

Event:

This is the folder for the event task. Programs assigned under this folder are executed at the rising edge of the specified event address. Right-click this and then select "Properties" to set the event address and priority.

Device:

You can open the list of devices, on which tags, description, initial values can be edited and use status of the devices can be listed. For more details, refer to "Appendix 8-2 Device."

Unassigned Programs:

Programs assigned here are invalid and not loaded to the PLC.

Function Blocks:

Function blocks (FB) created by a user are registered here. You can also import and register expansion FBs provided by Fuji Electric. When converting a MICREX-F program, the loader system automatically registers FBs for conversion.

Simulation:

This folder is used for the simulation function. For more details, refer to "Appendix 3 Simulator Function."

Array/Struct:

Arrays and structures are defined. For more details, refer to "Appendix 4 Arrays/Structures."

File Defines:

Used in pairs with a file instruction (incl. FFST_MF, FIFO_MF, and FILO_MF). If a file instruction is included in a MICREX-F program that is converted, they are automatically defined.

Appendix 8-1 Resource

Right-click the Resource icon to open the "Resource Properties" or "Optimization setting" dialog box.

(1) Property

When converting a MICREX-F program, the optimum settings are made automatically on the "Resource Properties" dialog box. The "Resource Properties" dialog box is only supported by SPH2000/SPH3000 series. (Not usable in SPH200/SPH300 series.)

Resourc	ce Properties	×
<u>N</u> ame:	Resource	
Conv	version	
	Permit the use of index <u>r</u> egister	
	☑ Bit reverse	
	The area for the last 358 words of the non retain memory area is set as a index register area.	
~	Permit the use of <u>T</u> imer/Counter MF	
	The area for the last 11072 words of the user FB memory area is set as a Timer/Counter MF area.	
V	Permit the use of temporary area and save area for task switch	
	Start Address: DM872	
	Use the 112 WORD from the address specified as a temporary area(48 WORD) and save area for task switch(64 WORD).	
•	Step control treated as a BCD value	
	OK Cancel	

- Permit the use of index register ⇒ Check this option to use index register instructions.
- Bit reverse ⇒ Specify the bit operation when the pointer of an index register is added or subtracted.
 - When checked: The same bit operation as MICREX-F. In the case of index register addition, the offset address is moved to the right (to the low-order).

When unchecked: The same bit operation as MICREX-SX. In the case of index register subtraction, the offset address is moved to the left (to the hight-order).

- Permit the use of Timer/Counter MF ⇒ Check this option to use timer and counter instructions suffixed with "_MF." The operation of these instructions is same as MICREX-F. 11072 (approx. 11K) words of the user FB memory is used.
- Permit the use of temporary area and save area for task switch ⇒ This option is automatically checked when a MICREX-F program is converted. The temporary area is reserved to make the program operation same as MICREX-F.
- Step control treated as a BCD value ⇒ Check this option to treat data as BCD when the step control memory is used as a word (WS). When unchecked, data is treated as decimal.

(2) Optimization setting

The "Optimization setting" dialog box is only supported by SPH3000 series.

SPH3000 is provided with two types of POU execution areas (high-speed/default). You can choose an area to which each POU is assigned. Programs assigned to the high-speed area are executed faster than those assigned to the default area. In addition, if you select "Valid," the program code is optimized to enable faster program execution.

The default setting is "Invalid." In this case, program optimization is not performed. Programs are automatically assigned to the high-speed program area in order from the top.

When you change this setting, you need to execute [Conversion] > [Conversion All] to load the program to the PLC. (Stop the PLC and transfer the program.)

It is not possible to optimize programs that have instructions suffixed with "_MF" (incl. TON_MF and MOVE_MF) that are automatically used for conversion of a MICREX-F program. Select "Invalid" for such programs.

How to make optimization settings

Right-click the Resource icon, and then select [Optimize]. The following dialog box opens. Select an "Optimize Option."

Optimization setting	×
Optimize Option(<u>P</u>): Invalid Valid The conversion time Individual at optional effective Invalid	Setting(<u>S</u>) 10 times
ОК	Cancel

- Valid ⇒ All the programs (including function blocks) are optimized.
- Individual ⇒ You can select which program to optimize.

• Invalid: (default) ⇒ None of the programs (including function blocks) are optimized.

When you select "Valid" or "Individual" for optimize option, the execution time of the "Conversion All" command is three to ten times longer than when "Invalid" is selected. The warning message appears on the loader screen.

◆ Click the [Setting] button. The "Option setting" dialog box opens.

Calling structure of programs and FBs is displayed. Select "Valid of optimization			d" or "Invalid" ion.	Select an area t "High-speed" or	o assign th "Default"(e program: See *1 and	d *2.)	
🙁 Option setting - (Arran	nge:Manual						×
<u>F</u> ile <u>S</u> etting	\			/				
🖃 🐳 Default:Default	$\overline{}$	POU Name	Optimize	Placement	POU Type	Language	Calls	Executable code
∔ Ladder1	1	_C2PVer	Valid /	Default	PROGRAM	LD	0	
Ladder 0		Cfrp2	Valid	High speed	FUNCTION_BLO	LD	1	19488
		CINC	Valid	High speed	FUNCTION_BLO	LD	9	224
		CLIMCK	Valid	High speed	FUNCTION_BLO	LD	8	288
ST1		CPCK11P2	! Valid	High speed	FUNCTION_BLO	LD	2	2496
ST0		FB0	Valid	High speed	FUNCTION_BLO	LD	1	64
		FB1	Valid	High speed	FUNCTION_BLO	LD	1	64
		Ladder0	Valid	High speed	PROGRAM	LD	1	256
		Ladder1	Valid	High speed	PROGRAM	LD	1	544
		Ladder2	Valid	High speed	PROGRAM	LD	1	160
		STO	Valid	High speed	PROGRAM	ST	1	128
		ST1	Valid	High speed	PROGRAM	ST	1	224
		ST1	Valid	High speed	PROGRAM	ST	1	224

- *1 To change these settings, uncheck "The placement of all POU are automatic setting" in the [Setting] menu. It is checked by default.
- *2 The program is automatically assigned to the high-speed area within the range of the memory size. If there is not enough memory size, the program is assigned to the default area.
- On the dialog box above, you can choose "Valid" or "Invalid" for optimization and "High-speed" or "Default" area for placement for each program.

After setting each item, click [File] menu > [Exit] to return to the "Optimization setting" dialog box. Click the [OK] button there. The following dialog box appears.



Click the [OK] button to complete the setting.

Make sure to execute [Conversion All] in the [Conversion] menu before loading the program to the PLC. Stop the PLC to load the program to it. (A program cannot be changed while the PLC is running.)

Appendix 8-2 Device

Double-click the Device icon to open the device window. Tags and descriptions edited on this window are reflected in the ladder circuit. Devices displayed here are common devices of the programs in a project and called "global device." They are used to edit the tags in a batch.

You cannot check the ON/OFF status of the devices on this window. To check it, use the monitoring function; click [Online] menu > [Data Monitor] > [Data Monitor 1].

[Device	e Type	selection button	_ [Upda	ite] button	
_	\	[Filter] bu	tton [L	Jse map] button	
F	Resourc	e			
1	М	<u> </u>	r		
1	(M WM			
	Used	Device	Tag	Description	Initial Value
	11-0-	M20	3V+	3V or more	
	11-0-	M21	8V-	8V or more	
	!- -	M22			
	!-()-	M23			
	. !	M24			
	!	M25			

 [Use status display]

<Character limit on a tag>

A tag can be up to 32 characters. The following symbols and character strings cannot be used:

Symbols "#," "\" (backslash), "," (comma), and "." (period)

A character string consisting only of numerical values (including a decimal number, a hexadecimal number, and a number starting with a plus (+) or minus (-) sign

The same character string as the device address

The same character string as the array expression (e.g. DATA[1])

<Character limit on description>

A description can be up to 50 characters. A comma (,) cannot be used.

• [Device Type] selection button ⇔ This button is used to switch the displayed devices.

- X, WX, DX: Input memory
- Y, WY, DY: Output memory

M, WM, DM: Internal memory (non retained)

- L, WL, DL: Internal memory (retain)
- SM, WSM, DSM: System memory
- T: Timer

The target are TON, TOF, TP and MR. The range is T8192 to T16383.

C: Counter

The target are CTU, CTD, and RCT. The range is C8192 to C16383.

- TR: Integrating timer
- The target is TMR.
- N: Section instruction
- S, WS: Step control
- GM: Global memory

The target are the processor-link memory of P-link, PE-link, or FL-net.

TM: MF timer

The target are the timer instructions with the suffix "_MF."

- CT: MF counter
 - The target are the counter instructions with the suffix "_MF."

RI/RJ/RK, WRI/WRJ/WRK, DRI/DRJ/DRK: Index register (excluding timer and counter)

RL/RM: Index resister (dedicated to timer and counter)

WFL, DFL: File memory

<Selecting device address>

The device screen shows 2038 lines from the top of the selected device by default. To display the lines after them, click the "Next page" button on the bottom right.

SX-F	Programmer S	tandard	- Арр8-	-2							_ []	x
<u>F</u> ile	<u>E</u> dit <u>V</u> iew	<u>P</u> roject	<u>O</u> nline	<u>C</u> onversion	<u>T</u> ools	<u>W</u> indow	<u>H</u> elp					
i 🛅 🕶 🛛	🧉 - 🛃 🛃	🗟 🐰	b (1),	A 19 0	- i 🎬 i	🖬 🖻 🗄	₩ 9	្ន 🖓 😓			📮 i 🖂	Ŧ
Resourc	e			_		_	_	_		_	д	х
M	• 🛛 🖉											×
Y	M WM											
Used	Device		Tag			Description			In	itial Value	-]
-()-	M0											
	M1											
	M2											
	M3											
	M4											
	M5											
	M6											
	M7											
	MQ											긔
												$\left \right $
Error : 0	, Warning : 2											
										/		
									[Previo	us page]	button	[

The [Search] function is also available.

For example, when you want to display "M3000," place the cursor on the device window and press the <Ctrl> + <F> keys. The "Find Tag" dialog box appears. Enter "M3000," and then click the [Find] button. The device window shows 2048 lines, in the middle of which is "M3000."

Find Tag			×
Fi <u>n</u> d what:	M3000	▼ <u>F</u> ind	Close
-			

<Local device of program>

Right-click on a program in the project view and select [Device]. The device screen opens. The devices shown there are valid only in the selected program (Ladder0 in the example below) and called "local device."

The local device includes T (timer), TR (integrating timer) and C (counter) and the target address is as follows.

T0 to T8191, TR0 to TR8191, C0 to C8191





Local: Lado	Local: Ladder0 🕴 🗸 🗸								
Τ	- 🛛 🛃		×						
т									
Used	Device	Tag	Description						
т	D	Timer0							
т	1								
T	2								
Т	3								
T	4								
Т	5								
т	5								
	7		Ĭ.						
			4 ▶						
Resource	e 🔢 Local: Lad	der0							

<Local device of user FB>

Right-click on an FB in the project view and select [Device]. The device screen opens. The devices shown there are valid only in the selected program (FB0 in the example below) and called "local device."

The local device includes T, TR and C, as in that of a program, and F/WF/DF (user FB memory) and V/WV/DV (I/O parameter). For F/WF/DF and V/WV/DV, only the defined memories are displayed.

WF can be retained during a power failure by checking the box of "Retain."



	Local: FB0 🛛 🕹 🗸 🗸											
	WF 🗸 🏹 🛃 📰											
·	WF VWVDV											
	Used	Device	Tag	Description	Initial Value	Retain						
		WF0										
		WF1										
		WF2										

• [Filter] button ⇒ This button opens the "Filter" dialog box. You can filter the devices displayed on the device window. Multiple filter conditions can be specified.

Perform filter setting for each device type. The following screen shows filter setting of M device.

Filter [Resource : N	1] 🔀
□ <u>U</u> se	© in use O not in use
🗖 Tag	🖸 has tag 🔹 🔿 no tag
	Tag
🗖 Initial <u>v</u> alue	has an initial value O no initial value
Address range	M — M
🔲 Ignore IO config.	
<u>R</u> eset	Apply Close

- Use: If "in use" is checked, only the devices used in the program are displayed. If "not in use" is checked, only the unused devices are displayed.
- Tag: If "has tag" is checked, only the devices that have tags in the program are displayed. By entering characters in the "Tag" box, only the tags that contain the entered characters can be displayed. By using "*", the devices that partially match the entered characters can be displayed.

Example) If you enter "Mem*", the tags starting with "Mem" are displayed.

If "no tag" is checked, only the devices without tags are displayed.

Initial value: If "has an initial value" is checked, only the devices in which an initial value is set in the program are displayed. If "no initial value" is checked, only the devices without initial value setting are displayed.

Address range: You can specify the address range to be displayed.

Ignore IO config: If this option is checked, only the I/O devices that have tags are displayed.

• [Update] button ⇒ This button updates the contents of the device screen.

• [Use map] button ⇒ When you select a device on the device screen and click this button, the use status of the selected device is shown in map form. The bit addresses used in the program are colored. "W" in the word column indicates that the device is used as word in the program.

Resource																	
M	-	1	7 🚦														
M (Use map)																	
Device	F	Е	D	С	В	Α	9	8	7	6	5	4	3	2	1	0	Use as WORD
WM0																	
WM1																	
WM2																	w
WM3																	
WM4																	

• [Use status display] ⇒ When the selected device is used in the program,

For bit device: a symbol of a contact or coil is shown.

For word/double-word device: "*" is shown.

If the devices is also used as another bit length, "!" is shown.

R	esource	_			Į Χ
÷	м	- 🍸 🙋	1 📖		×
Ν	м (Use map)			
Γ	Used	Device	Tag	Description	Initial Value
	! ¹¹ -0-	M20	3V+	3V or more	
	1 ⁻¹¹ -0-	M21	8V-	8V or more	
	!- -	M22			
	!-()-	M23			
	!	M24			
	i	M25			

In the screen above, symbols of a contact and a coil are shown for M20, which indicates that M20 is used as a contact and a coil in the program.

"!" is also shown, which indicates that M20 is also used as another bit length (WM2 or DM2).
Appendix 8-3 Unassigned Programs

When you delete a program folder in the project view, it is moved into the "Unassigned Programs" folder. The programs assigned in the "Unassigned Programs" folder are not loaded to the PLC.

<Example of an unassigned program>



Appendix 8-4 Function Blocks

"Function Blocks" is a folder to which user FBs (function blocks) are assigned. When expansion FBs provided by Fuji Electric are imported, they are assigned here. For more details of how to create a user FB, refer to the user's manual Introduction (FEH597) "4-2 User FB."

Appendix 8-5 Simulation

"Simulation" is a folder used to create a simulation panel. For more details, refer to "Appendix 3 Simulator Function."

Appendix 8-6 Array/Structure

"Array/Struct" is a folder used for the array/structure function. For more details, refer to "Appendix 4 Arrays/Structures."

Appendix 8-7 File Defines

"File Defines" is automatically created when a MICREX-F program that contains a file instruction or a table instruction is converted.

To connect a CPU module with a built-in USB port and a computer using a USB cable, you need to install the USB driver for MICREX-SX in the computer. You can install the USB driver either offline (without connecting the computer to the PLC) or online (by connecting the computer to the PLC).

Appendix 9-1 Offline Installation

This function is supported by Standard loader V3.0.10.19 or later versions and Windows Vista or later operating systems. For older versions of Standard loader and Windows XP or earlier operating systems, follow the procedure explained in "Appendix 9-2 Online Installations."

 Click [Start] of Windows > [All Programs] > [SX-Programmer Standard V3] > [Tools] > [USB Driver For MICREX-SX]. The following dialog box opens. Click the [Next] button.





♦ A message appears saying "The drivers are now installing." If the screen saying "Windows can't verify the publisher of this driver software" appears, click "Install this driver software anyway."

Device Driver Installation Wizard					
The drivers are now installing					
Please wait while the drivers install. This may take some time to complete.					
< <u>₿</u> ack <u>N</u> ext > Cancel					
🛞 Windows Security					
Windows can't verify the publisher of this driver software					
 Don't install this driver software You should check your manufacturer's website for updated driver software for your device. Install this driver software anyway Only install driver software obtained from your manufacturer's website or disc. Unsigned software from other sources may harm your computer or steal information. 					
See details					

The screen appears saying "Would you like to install this driver software?" Check [Always trust software from "Fuji Electric Co., Ltd."], and then click the [Install] button.



The screen appears saying "Completing the Device Driver Installation Wizard." Click the [Finish] button. The offline installation is now complete.



The actual setup of the driver in the computer is executed when connecting the PLC to the computer using a USB cable. The progress of the setup is displayed on the bottom right of the computer screen.



In the Device Manager, the installed driver software is shown as "MICREX-SX" under "Loader USB device" as shown below.



Appendix 9-2 Online Installation

Connect the computer to the PLC using a USB cable. A message saying "Installing device driver software" appears on the bottom right of the computer screen. The Windows standard USB driver is installed in this step, therefore, a message saying "Device driver software was not successfully installed" appears next. Perform overwrite installation of the USB driver following the procedure below.



◆ Click [Start] of Windows > [Control Panel]. Select "Large icons" for View by," and then click "Device Manager" from the list.



♦ On the "Device Manager" screen, right-click "Unknown device," and then select "Update Driver Software."



On the following screen, click "Browse my computer for driver software."

🔋 Up	×		
\bigcirc	<u> </u>	Jpdate Driver Software - Unknown Device	
	How do you want to search for driver software?		
	•	Search automatically for updated driver software Windows will search your computer and the Internet for the latest driver software for your device, unless you've disabled this feature in your device installation settings.	
	•	Browse my computer for driver software Locate and install driver software manually.	
			Cancel

- On the following screen, click the [Browse] button to specify the location of the USB driver. The USB driver is located in the folder where Standard loader is installed. The default folder where Standard loader is installed differs depending on the computer.
 - 32-bit computer
 - C:\Program Files\Fuji Electric\SX-Programmer Standard\Driver\MICREXSX 64-bit computer

C:\Program Files(86)\Fuji Electric\SX-Programmer Standard\Driver\MICREXSX After specifying the folder, click the [Next] button.

pdate Driver Software - Unknown Device	×
Update Driver Software - Unknown Device	
Browse for driver software on your computer	
Search for driver software in this location:	
ram Files\Fuji Electric\SX-Programmer Standard\Driver\MICREXSX 💌 📴	rowse
Include subfolders	
Let me pick from a list of device drivers on my computer This list will show installed driver software compatible with the device, and all drive the same category as the device.	rer software in
	Next Cancel
	Browse For Folder Select the folder that contains drivers for your hardwar
	Fuji Electric SX-Programmer Standard SX-Drogrammer Standard Gonfigure DEF DEF Diver
	Win98
	K64
	Eolder: MICREXSX

A message appears saying "Installing driver software." If the screen saying "Windows can't verify the publisher of this driver software" appears, click "Install this driver software anyway."

Update Driver Software - MICREX-SX	×
Update Driver Software - MICREX-SX	
· ·	
- · · · · · · · · · · · · · · · · · · ·	
Installing driver software	
	-
Windows Security	×
in the second	
Windows can't verify the publisher of this driver software	
Don't install this driver software	
You should check your manufacturer's website for updated driver software for your	
device.	
N Tark- Uklin driver og flummer og som som	
Install this driver software anyway Only install driver software activity of features for the software is well site of the software is the software in the software is the software in the software is the software in the software is the software	

 Install this driver software anyway
 Only install driver software obtained from your manufacturer's website or disc. Unsigned software from other sources may harm your computer or steal information.
 See <u>d</u>etails

The screen appears saying "Would you like to install this driver software?" Check [Always trust software from "Fuji Electric Co., Ltd."], and then click the [Install] button.

🖬 Windows Security	×
Would you like to install this device software?	
Name: CDM Driver Package - Bus/D2XX Driver Publisher: Fuji Electric Co., Ltd.	
Always trust software from "Fuji Electric Co., Ltd.".]
You should only install driver software from publishers you trust. How can I decide which device software is safe to install?	

The message appears saying "Windows has successfully updated your driver software." Click the [Close] button. The online installation is now complete.



In the Device Manager, the installed driver software is shown as "MICREX-SX" under "Loader USB device" as shown below.



Appendix 9-3 When USB Communication Fails

If USB communication fails although the USB driver has been successfully installed, perform the following steps.

(1) Check the status of the PLC

Connectors (IN and OUT) for SX bus expansion are provided on the left end of a PLC base board. Make sure to connect SX bus terminating plugs there. Without them, the loader communication may not be performed normally. In the case of an SX bus expansion system, connect terminating plugs at both ends of the SX bus after connecting an SX bus expansion cable. In the case of a single CPU system, set the CPU No. selection key switch at "0."



(2) Check the status of the computer

If communication cannot be established even after the step (1) is performed, restart the computer. If still not established, try to use another USB port of the computer.

Fuji Electric Co., Ltd.

Gate City Ohsaki, East Tower, 11-2, Osaki 1-chome, Shinagawa-ku, Tokyo 141-0032, Japan

E-mail: micrex-sx@fujielectric.com URL: http://www.fujielectric.com/

Materials covered in this document are subject to revision due to the modification of the product.