µGPCsH series

TDFlowEditor Manual: Operation



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Introduction

Thank you for purchasing the Toyo Denki FA μ GPCsH digital controller.

This manual explains the interface of the TDFlowEditor and how to use the program. In order to use the μ GPCsH correctly, please read this manual first.

You should also read the related manuals below.

Title	Manual number	Content
µGPCsH Series Programming Manual (Instruction Words)	QG18719	μ GPCsH Series memory, language, system definitions etc.
µGPCsH Series User's Manual (Hardware)	QG18720	μ GPCsH Series system configuration, hardware specifications of each module etc.

Caution

- (1) No part of this manual may be reproduced or duplicated without permission.
- (2) The content of this manual is subject to change without prior notice.
- (3) We have endeavored to make this manual as complete and accurate as possible. However, if you notice any errors or ambiguities, please report them to the sales office shown on the back of this manual, stating the manual number indicated on the front cover.

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Safety Notice

Read the "Safety Notice" carefully before using the product and use the product accordingly. In this manual, safety-related items are divided into "Danger" and "Caution" as follows.



Danger: Mishandling may cause death or serious injury.

Caution: Mishandling may cause moderate bodily injury, minor injury or damage to property.

Note that items marked A Caution may also result in other serious consequences depending on the circumstances.

All safety notices contain important information which should be strictly observed. Matters requiring special attention are shown below, which are also indicated with the marks shown above.

Danger

Emergency stop circuits and interlock circuits should be implemented outside the PC. Malfunction of the PC may result in damage or accidents involving the machinery.



Only perform operations such as changing programs, forced output, start, stop, etc., after ensuring safety. Incorrect operation may cause the machine to function, resulting in accidents or damage to the machinery.

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Revision History

* The manual number is shown at the bottom right of the cover sheet.

Date printed	* Manual number	Details of revision
2010.10	QG18721	First edition issued

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Preparation and Startup of the System Chapter 1

Configuration of the µGPCsH Programming Tool System 1-1

1-1-1 Configuration of the μ GPCsH Programming Tool System

By installing TDFlowEditor (system software) on a personal computer as shown in the figure below, it can be used as a programming tool for μ GPCsH.



*µ*GPCsH

The USB cable is a commercially available type A to mini B cable.

Recommended cable: Misumi

Туре	Length
PNUC2-AM-MBM-0.9M	0.9 m
PNUC2-AM-MBM-1.8M	1.8 m



You can also connect TDFlowEditor via the Ethernet interface of the CPU module. In this case, in TDFlowEditor select "Tool" \rightarrow "Environment Setup" \rightarrow "ConnectCom Setup" \rightarrow "Ethernet." In "IO Allocation," set "IP Address" and "Port Number" to the same setting as in "CPU/FL-net/Ethernet setting" \rightarrow "IP Address" in the CPU module, and the same setting for PLC command port num (1) to (3).

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1-2 System Requirements

1-2-1 Hardware Requirements

To run TDFlowEditor, the following hardware requirements must be met.

- An IBM-compatible personal computer or DOS/V personal computer with Intel Pentium CPU (300 MHz or more recommended).
- Windows VGA resolution 800×600 or higher (SVGA 1024×768 recommended).
- Free hard disk space of 100 MB or more.
- Memory of 32 MB or more.
- CD-ROM drive.

1-2-2 Software Requirements

To run TDFlowEditor, one of the following operating systems is required. Microsoft Windows 2000 (English or Japanese)

Microsoft Windows XP (English or Japanese)

Microsoft Windows Vista (English or Japanese)

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1-3 Installation and Uninstallation

1-3-1 Installation

The TDFlowEditor software package is delivered on a CD-ROM. The installation disk includes an installer program that automatic installs the software.

When the installation is performed over a network, the program may not be copied and installed correctly depending on the network environment and the environment of use.

Installation

- (1) Disable antivirus software, screensavers and other software that runs in the background.
- (2) In Windows 2000, XP or Vista, click "Start" and select "Control Panel."
- (3) In the "Control Panel" click "Change/Remove."
- (4) Click "Install."
- (5) Insert the CD-ROM in the CD-ROM drive.
- (6) Click "Next."
- (7) Check that "[CD-ROM drive name]:¥Setup.exe" is displayed in the command line text box of the installer. If it is not, click "Browse," select the CD-ROM drive and select "Setup.exe."
- (8) The InstallShield Wizard dialog box appears.
- Note: The installer detects the language of the OS and if the OS is English, TDFlowEditor starts up in English.



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The dialog box on the left appears.

Click "Next" to start the installation. Clicking "Cancel" stops the installation.

Specify a folder for the installation.

If you do not want to change the folder, click "Next." To change the folder, click "Browse" and select a folder.



Select a group for the installation. Normally, this should not be changed.

Note: The English language font of the installer cannot display Japanese application names correctly, but this does not affect the operation of the software.

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A dialog box to confirm the installation appears. If the information displayed is correct, click "Next." The installation starts.

Clicking "Cancel" during the installation pauses the operation.



The following dialog box appears.



Clicking "Resume" resumes the installation. Clicking "Exit Setup" exits the installer.

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1-3-2 Uninstallation

- (1) In Windows 2000, XP or Vista, click "Start" and select "Control Panel."
- (2) In the "Control Panel," click "Change/Remove."
- (3) Select TDFlowEditor and click "Add and Remove."



The message box "Are you sure you want to completely remove the selected application and all of its components?" appears.

Confirm	File Deletion 🛛 🕅
?	Are you sure you want to completely remove the selected application and all of its components?
	<u>(北い役)</u> いいえ(<u>N</u>)

Click "Yes" to uninstall the program. Click "No" to cancel uninstallation.

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Chapter 2 TDFlowEditor User Interface

2-1 TDFlowEditor Interface and Functions

2-1-1 TDFlowEditor Interface

When TDFlowEditor starts, the following window appears.



Project tree

The project is displayed as a tree. Double-clicking an item opens a window for editing the item.

Work space

Displays a window for editing items.

Menu bar	A menu of functions
File	Commands for configuring, saving, designing and printing projects.
Edit	Commands for editing the configuration of subprograms in the project.
View	Commands for displaying cross references in the project and displaying and hiding tool bars.
Online	Commands for uploading and downloading projects, controlling the μ GPCsH, and displaying the status of the μ GPCsH.
ΤοοΙ	Environment settings for tools, and trace back settings. The environment settings for tools include the color of each window, TDFlowEditor settings, and settings for communication with the μ GPCsH.
Window	Commands for changing the appearance of the window.
Help	Displays the TDFlowEditor "Version" information.

The items in the "File," "Edit," and "View" menus differ according to the task being performed.

2-1-2 Tool Bar

The tool bar contains buttons for operations that are used frequently, grouped together for convenience.

Chapter 3 Creating a Project

3-1 Projects

3-1-1 The TDFlowEditor Window

The project tree is a window that displays the items required for editing. The tree consists of the group "IO allocation," "Task 1," "Task 2," "Task 3," "Task 4," and "Subroutine."



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3-1-2 What Is a Project?

A μ GPCsH application program consists of IO allocation and tasks in a single CPU. Collectively, these are called a "project."

The relationship between TDFlowEditor and projects in the μ GPCsH



Tree item	Content
IO allocation	Edit the IO configuration of the μ GPCsH system.
Task 1	A task determines the processing of subprograms (execution time schedule). Up to four
Task 2	tasks can be executed at one time. However, Task 1 has a higher priority than Task 2.
Task 3	Several programs exist in Task 1, Task 2, Task 3, and Task 4, and these include circuits,
Task 4	relay register use marks, constant data, and pattern data. You can define separate scan times for Task 1, Task 2, Task 3, and Task 4 for running μ GPCsH.
Subroutine	A subroutine is a circuit that can be called from a subprogram. It can be called from the multiple subprograms that exist in Task 1, Task 2, Task 3, and Task 4. (A subroutine cannot be called from another subroutine.)

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3-1-3 What Are Task 1, Task 2, Task 3, and Task 4?

A task determines the processing of subprograms (execution time schedule) from the scan time. The μ GPCsH series has four types of processes, Task 1, Task 2, Task 3, and Task 4. The numbers 1, 2, 3, and 4 indicate the priority of the tasks, and 1 has the highest priority.





Output relay, register refresh

IO refresh processing (hardware)

User program operation

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3-1-4 Projects in the μ GPCsH

Correspondence between the μ GPCsH and TDFlowEditor



Processing that performs downloading and uploading.

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3-2 Editing a Project

3-2-1 Creating a Project

File menu	Content
New Project	Creates a new project. When the program is started for the first time, a new project is created automatically. Once a project has been edited, the project is automatically opened from the next time you start the program.
Project/Compress Project Open	Opens an existing project or compressed project (a project saved with "Save a Project by Compression").
Project Save	Saves the current project. When working on a new project (when the topmost item of the project tree is displayed as "Project"), enter the name of a project to overwrite.
Project Save As	Save the project with a different name.
Project Compression	Saves files in a project as a single compressed file.
Save	(The name of the project and the name of the file saved by compression are different.)
Print	Prints the content of the project.
CPU Change	Changes the type of CPU.
Compare Check	Compares the currently open project and a saved project.

"Save a Project by Compression" is best suited for making a copy onto a floppy disk or for creating a backup file.

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3-2-2 Compare and Check

Compare and check compares the currently open project and a saved project. To perform "Compare and Check" online with a project that is downloaded in the μ GPCsH, upload the project using "Online" and "PLC Connection" and select "Compare and Check." If any difference is found, that part is displayed.

Items covered by compare and check

- System definition
- Scan time
- Trace back settings
- Circuit
- Relays and registers used
- Constant, timer and counter
- Pattern data

Changed items Details	of change C	hanged value	Save	d value	
🖫 Compare				×	
Save to CSV file. [Origi [Com	n of Comparison]TEST parison place]D:¥TEST.p	nj			
	TEST		TEST[Con	nparison place]	
	6		10		
	0		5		
SPG1					
Use mark mi	64		48		
mr	304		288		
pi	3		3		
pr	pr 0		0		
Circuit number1	B00048	B	B000	048	
	1: — / K	-	1:	—	
l					
For example, if a	circuit has been	changed, the ci	rcuit number. I	label name, symbol and	
line number that	have been chanc	avelasib are har	d	-,-,	

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3-2-3 Tree Node Pop-Up Menus

When an item other than the name of a subprogram (tree node) is selected, the following menu is displayed.



When an item of a subprogram (tree node) is selected, the following menu is displayed.



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3-2-4 Editing a Project

Edit Menu	Content
Operation order is raised	Raises the order of operation of the subprogram selected in a project tree.
Operation order is lowered	Lowers the order of operation of the subprogram selected in a project tree.
Change the Program Name	Allows you to change the name of a selected subprogram. To change a subprogram name, choose the subprogram in the project tree and execute this command.
Create a New Program	Creates a new subprogram.
Delete a Program	Deletes the selected subprogram.
Copy a Program	Copies the subprogram and uses it to create a new subprogram.
Addition of a Program	Adds a program.
Relay Display, Register Display, TraceBack Display	
All Program Cross Reference	Finds and displays cross references related to all subprograms in the project.

When creating a new subprogram or making a copy of a subprogram, the following dialog box is displayed.



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3-2-5 Addition of a Program

Adds a program. The Sub Program Add dialog box appears.

Sub Program Ad	d					<u> ? ×</u>
Look jn:	C Sample		•	🗢 🗈 💣		
My Recent Documents						
My Documents						
My Computer						
My Network Places	File game:			•	<u>_</u>	oen
Places	Files of type:	Parameter file(".par,".	PRM)	*	Ca	ncel

Select a file that was prepared with the μ -GPCH, μ GPCsx, or μ GPCsH (Extension: .par/.smb/.msg/.cmt) Alternatively, you can add a subprogram by dragging and dropping from Windows Explorer into the project tree.



The Sub Program Add dialog box appears. Enter a program name and click "OK."



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3-2-6 All Program Cross Reference

Finds cross references concerning all subprograms and subroutines in the project.

You can enter only a data attribute, for example "G0" or "mi," or you can enter it with the offset part, as in "G00000" or "mi00000."



Cross reference information

XXXX-YY (Z)

XXXX: Circuit number

- YY: Line number
- Z L: Load (contact), S: Store (coil)
 - I: Function, subroutine argument (input)
 - O: Function, subroutine argument (output)
 - b: Unconditional execution subroutine
 - f: Unconditional execution function
 - B: Conditional execution subroutine
 - F: Conditional execution function

You can change the colors of S, I, O in "Tool" \rightarrow "Environment Setting."

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3-2-7 Tool Bars

Select whether to show or hide each tool bar.



The buttons feature icons designed to show what they are for, but you can also place the mouse pointer over any button to display a label showing the name of the tool (command name).

Chapter 4 Editing a Circuit

4-1 Editing the Circuit of a Subprogram or Subroutine

4-1-1 Circuit Window Modes

The circuit window has five modes.

Mode	Content
Read Mode	The initial mode when an existing circuit is opened. You can only view the content of a circuit. From this mode, you can move to each of the other modes.
Write Mode	You can edit circuits in this mode.
Monitor Mode	You can monitor the operating status of the μ GPCsH circuit.
Debugger Mode	You can perform various debugging functions.
Circuit Listing	Displays a circuit in the form of single-page slides.

Read Mode window

TDFlowEddor (OVTESTpri) File(E) Edit(E) View(W) Online(EEEE @ DE COULDE EEEE @ DE COULDE	》 Tolty Window Window (North State (1995)	
Traf Test Test Test Test Test Sea Tra Provide Traf Preventer Test Preventer Test Preventer Sea Tra Se	1 4 5 6 7 4 9	
	⁰ Nonitor ¹³ 41 nsert ⁵ Write 4List ⁷ Convert ⁴ Comment ⁴ Cross 9Guit Shift	2

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4-1-2 Transition between Modes

The transition between modes is shown in the diagram below.



Transition to Monitor Mode

4-2 Write Mode

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4-2-1 Basic Write Mode Operations

Function key arrangement (main menu of the Write Mode)

1 End | 2 Line | 3 Ladder | 4 Num | 5 NumCp | 6 Func1 | 7 Func2 | 8 Edit | 9 Cross | 0 10 <> 16 | Shift | ["""""]

"End"

Ends the Write Mode and moves to the Read Mode.

"Control Line" "Ladder" "Numeral" "Numeric Operation" "Function 1" "Function 2" These function keys switch to the following menus of symbols for insertion.

Control Line	$1 \text{ Nenu} 2 \oplus 3 \rightarrow \oplus 4 + 5 + 5 + 7 + 8 + 9 + 0 - Shift 1 + 5 + 7 + 8 + 9 + 0 - Shift 1 +$
Ladder	$1 \text{ Nenu} 2 \oplus 3 \rightarrow \oplus 4 5 \oplus B 6 7 8 9 9 0 Shift 1 + $
	¹ Nenu 2 → $ - 3 - 4 - () 5 6 - F 7 - 8 - 9 - 0 - Shift [1 $
Numeral	¹ Nenu 2
	$1 \text{ Nenu} = 0 + 3 \rightarrow 0 + - + 5 = 1 - 6 - + 5 + 7 = 8 = 7 + 9 = 7 - 0 = 0 + 16 + 16 + 16 + 16 + 16 + 16 + 16 + $
Numeric Operation Shift	1 Nenu 2 -⊕ 3 -⊖ 4 😥 5 😥 6 😥 7 -₽ 8 -₽ 9 兆> 0 Shift [["""""]
	1 Nenu 2 🚸 3 🚸 4 🔿 5 6 🕀 7 🕀 8 9 — 0 Shift [1******]
Function 1 Shift	
Function 2 Shift	1 Menu 2 — []— 3 — []— 4 — []— 5 — []— 6 — []— 7 8 — []— 9 — []— 0 ┙ Shift ["""""]

Shift

Switches each function menu.

[___]

You can move the function menu to the top or bottom of the window.



Currently at the bottom. Click to move to the top.

Currently at the top. Click to move to the bottom.

This setting will also be reflected next time you start the program.

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4-2-2 Edit Menu

1 Nenu 2 Sel ect 3 Cut)	Cff 4 Copy 5 Faste 6 LnIns 7 LnClr 8 LnDel 9 Return 9 LnCpy Shift ["""""]
Menu	Content
Main Menu	Returns to the main menu of the Write Mode.
Select	The cursor position becomes the starting point for selecting the range for cutting or copying.
Cut	Cuts the area anglesed in the box

Edit: Switches to the edit menu.

Select	The cursor position becomes the starting point for selecting the range for cutti
	or copying.
Cut	Cuts the area enclosed in the box.
Сору	Copies the area enclosed in the box.

Paste Pastes the cut or copied content. The box drawn at the cursor position is canceled. (The select operation is Cancel canceled.)

Selecting with the box



Note that you can also select "Select," "Cut," "Copy," and "Paste" from the Menu Bar or by right-clicking to display the pop-up menu.

1 Nenu	² Sel ect ³ Cut Cff ⁴ Copy	⁵ Paste	⁶ LnI ns	7 LnCl r	[®] LnCel	⁹ Return ⁰ LnCpy	Shift	[~~~~]

Menu	Content
Line Insert	Inserts a single line at the cursor position.
Line Clear	Clears the line at the cursor position.
Line Delete	Clears the line at the cursor position, deleting a single line.
Return	Cancels the last "Line Clear" or "Line Delete" operation once only.
Line Copy	Copies the line at the cursor position into the first space line below the cursor line.

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4-2-3 Cross Reference

Displays cross references.



"10<>16"

Switches the integer data used in the circuit between decimal and hexadecimal. The current mode is shown in blue.

Decimal display

⁰10<><mark>16</mark>

⁰<mark>10</mark><>16

Hexadecimal display

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4-2-4 Inserting an A Contact

1 Nenu 2 — H

) 5-

	/	/ Po sy	ositior mbol	n the	curso	or wh	ere yo	u wa	ant to	insert	the		
1	[[SPG1] Ci	ircuit Nur	nber[1] O	ircuit nu	mber[1]								
1	1 1 1 -	2 3	4	5	-	7	8	9	10	-	13		
2		-	1	1	1 2	а . А	· ·	-	-	-			- -
1	Nenu 2		- 3 — -	<u> </u>	-() 	5-~~	<u> </u>	7		<u> </u>	<u> </u>	ı → Sh	ift ["""""]
		١	\Sel	ect a	sym	bol to) insert	t.					
	[SPG1] Ci	ircuit Nun	nber[1] C	ircuit nu	mber[1]			0	10	11 12	12		
1	G0 Global	relay		-				3		-			
2		-	4	4	4	÷				-			
3	- ·	1.1	÷ .	100	÷	÷	e - e	1.1	÷ .	-			

Select a relay name from the list box. You can also enter a name directly in the list box.



- 6 - F

~~

Directly enter a relay number. If necessary, enter a contact comment. Press the [Enter] key to move to the next cursor position.

9 -

Shift



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4-2-5 Inputting a Coil

Place the cursor after the contact symbol.

191	[SPG1]	Circuit	Number[[1] Circui	it number	·[1]								
	1	2	3		4	5 6	7		8 9	10	0 1	1 12	13	
1	B0000	1 +	+	+	+	+	+	+	+	+	+	-		
2	-	+	+	•	+	+	+	•	+	+	+	-		
з	-	•	+	•	+	•	+	•	+	•	+	-		
4	-	•	+	•	•	+	+	•	+	+	•	-		- -
<u>I N</u>	enu	2	II 3 -		4-(거 [5 — [<u>→</u> 6-	F	7 -	R	_ º	- 0	- Shift	[]

Select a coil symbol and the following ladder appears.



Example of entering an AND circuit: In the following situation, when you insert a control line symbol, the required line is added automatically.





Example of setting a timer coil

Enter timer and counter values below the coil.



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4-2-6 Designating a Timer



Enter a timer name and in the line below, enter a timer value. 00.00S is displayed if the timer value is zero. If you do not enter a timer value, the current value remains unchanged.

Timer value input format

Input	Content			
00H00M	Sexagesimal	H: Hour	Sexagesimal	M: Minute
00M00S	Sexagesimal	M: Minute	Sexagesimal	S: Second
00.00S	Decimal S: Second			

You can also set the timer value in the Constant Timer Counter window. If you use the same timer name with a different value, the one with a higher Line No. is valid, and if you specify a different circuit, the value of the most recently edited circuit is valid.

Designating a Counter

Counter value input area 100

Enter a counter name and in the line below, enter a counter value. 000000 is displayed if the counter value is zero. If you do not enter a counter value, the current value remains unchanged.

Counter value setting range

0 to 65535

You can also set the counter value in the Parameter window. If you use the same counter name with a different value, the one with a higher Line No. is valid, and if you specify a different circuit, the value of the most recently edited circuit is valid.

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4-2-7 Entering a Data Flow

To enter constant data, insert a load instruction and enter a value under the name.



Insert the addition symbol at the cross point (+) to the right of the load instruction.



After inserting a load instruction below, add wiring.



The data flow is always terminated with a store instruction.

Insert an example of a symbol input accompanied by a data name between the cross points.



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4-2-8 Constant Representation

Input a numeral in the line below the symbol.

When the constant value is zero, Integer type (kiXXXX): 000000 Real number type (krXXXX): .00000 are displayed.

Example of a constant input

Item	Content	
Integer	123 (Decimal)	80H (Hexadecimal)
	-123 (Decimal)	8005H (Hexadecimal)
Real	123.4	.12345
number	-123.4	2345

For a real number less than 1, the digit of 1 is omitted.

You can also set the constant value in the Parameter window. If you enter a different value in a constant with the same constant name, the one with a higher Line No. is valid, and if you specify a different circuit, the value of the most recently edited circuit is valid.
Page	37/100	Symbol
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4-2-9 Function Symbol

After you insert a function symbol, the argument setting window appears.

1	1 2 3 ki0001 G00002	4 5 6 mr0000 mi0001 TSTD	7	8	9	10
2	ki0002	ARC Reset	G00001		<u>_ </u>	.
3	0 mi0001 indx_y 	Maximum_increasing_rate(>0.0)p/s Maximum_decreasing_rate(<0.0)p/s	kr0002 kr0001	.00000	-	a.
4	ZOYO90 USUC	OK Cancel	Applicat	ion		
5		0 mi0000	-	1		

After closing the argument setting window, you can display it again by double-clicking the function symbol. For the parameters of each function, refer to the Programming Manual.

You can also input symbols by right-clicking.

The parameters of the function or subroutine are displayed when you place the mouse pointer on a function symbol or subroutine symbol.

• -	Subrout ine
INDI	
	Sequence
Subroutine n	ni0010 b00000 b00002 mr0000 b00004
+	

Page	38/100 Symbol
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4-2-10 Pop-Up Menus

Right-click to display a pop-up menu of symbol insertion functions and editing functions. The pop-up menu has the following sub-menus.

Main	Control command	Logic	Numerical value	Numerical operation	Function
Wrine Select OrrOff Numerical value Numerical operation Eunction	Connector_load Connector_store Label_command Terminus_line Terminus_line	H Contact_A K Contact_B Cogic_reversal () Coil System_function(Conditional) SB Subroutine(Conditional) Terminus_line	 Load Store and load Store Contact_a Contact_c Contact_c Comparison_Hieh Comparison_Low Constant_data@nteger_number) Constant_data@nteger_number) Constant_data@nteger_number) Terminus_line 	 ↔ Addition ↔ Subtraction >> Multiplication >> Division >> Surplus >> High_rank_priority(Minimum_limiter) >> Low_rank_priority(Maximum_limiter) >> AND >> OR >>> Exclusive=OR >>> Terminus_line 	Mark_conversion Yomplement Absolute value conversion Increment Decrement Half Twice Square Twice Square Square Square from Supportial function Square groot Bit_count Bit_count Square groot Bit_count Decapband Pattern Differential compensation Phase compensation Plocompensation Pl_compensation ARC S-ARC Filter PID_compensation Delayed temporarily(Moving_average) Delayed temporarily(Moving_average) Delayed temporarily(Moving_average) Sourcourine Move and a stress System_function Minimum_limiter_above Minimum_limiter_above Minimum_limiter_above Subroutine Subroutine

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4-3 Designing a Subroutine

4-3-1 Adding a Subroutine

Create a new program in a project tree to add a subroutine.



Set the subroutine.



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4-3-2 Editing a Subroutine

The transmission of data with a subroutine is performed using arguments. An argument means a parameter that is passed from an invoking circuit to a subroutine program, or the result of an operation that the circuit receives from the subroutine. The number of parameters (number of inputs and outputs) that are set in the subroutine setting screen on the preceding page is reflected in the argument setting screen. The input and output parts are distinguished by their color. On the left, input the label name to be passed to the subroutine for input, or a label name to be received from the subroutine for output. As an argument, you can set a relay symbol name in addition to a numerical register name.



Page	41/100	Symbol	
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	🔝 [SPG	3] Circuit N	umber[1] Circ	cuit numb	per[1]					
		2 010 SUB 5b	(g00011)	4	5 6	; 7 +	+	9	10 🔺	
	2 -	A .	+ B] •	N	+			•	
	3 -	+		+	+	1.	•	•	+	
		101: 10	Ladder (4 N.	In E N	ode Euro	- 117 1	do muta i		▼ ▲ 16 01 (\\16	
		l'Line l'		im laivi	umcgo Fun		2 °Eαιτ	⁹ Crosq		
	ISUE	-1 Circuit	Number[1] C	rcuit nun	nber[1]		7	8		
$\langle \rangle$	1 si	0000 si0	006	si()008 (si0					È
V			: 00							
	2 -		- 100 - 100	04	а. С	4		а. С	-	
	H									
	3 -	-	-	-	-	4	4	-	-	
					1 1.					
	1	2 Nonite 3	₄Inser	t s Writ	tļ¶List]7(ònver sCo	nner ®Cro	s∥9Guit	Shift [~~~	""""]

Sb Subroutine			_ 🗆 🗵
Input->si0002		ki0000	10
Input->si0004		mi0001	
Output si0006->		mi0010	
Output si0008->		g00000	
OK	Cancel	Applicat	ion

When you use si0000 (or sr0000 or SI0000) as a stack register as shown in the subroutine in the figure above, the data is passed as shown by the arrows. "A" on the invoking side is an input, and "B" is an output.

Flow of the subroutine shown in the figure above

- (1) The invoker value g00010 is loaded in si0000, and the value ki0000(=10) set with the argument is loaded in si0002. These two values are added in the subroutine.
- (2) In si0006, the value calculated in (1) is stored, and is stored in mi0010 as set by the argument.
- (3) The value of mi0001 set by the argument is loaded in si0004, and is multiplied by the result of (2).
- (4) In si0008, the value calculated in (3) is stored, and is stored in g00000 as set by the argument.
- (5) Finally the value of (4) is loaded in si0000, and is stored in g00011 of the invoker.

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4-4 Circuit Listing

4-4-1 Circuit Listing Operations

The circuit listing is used for deleting, transferring or copying pages of a circuit.



Menu	Function
Circuit Move	You can move circuits by drag-and-drop. When you drag, the mouse pointer
	changes to the cursor icon shown at right.
Circuit Copy	You can copy circuits by drag-and-drop. When you drag, the mouse pointer changes to the cursor icon shown at right.
Circuit Delete	Deletes the selected circuit. You can also delete circuits with the [Delete] key.
Circuit Divide	Creates a new subprogram from the selected circuit.



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You can also copy circuits from another subprogram.



After selecting "Circuit Copy," you can drag and drop a circuit from another subprogram to copy it.

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Moving "E" on page 5 to page 2



What Is Moving?

Moving is the procedure for moving a selected page to a designated page using drag-and-drop when there are multiple pages in a single subprogram. In the figure above, by moving "E" on page 5 to page 2, the subprogram that was in the order "A" "B" "C" "D" "E" changes to the order "A" "E" "B" "C" "D."

• Copying "E" on page 5 to page 2



What Is Copying?

Copying is the procedure for copying and inserting a selected page in a single subprogram to a designated page using drag-and-drop. In the figure above, by copying "E" on page 5 and inserting it in page 2, the subprogram that was in the order "A" "B" "C" "D" "E" changes to the order "A" "E" "B" "C" "D" "E." Unlike moving a page, a copied page remains as it is, and the page number increases by one after the inserted page.

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• Dividing from "C" onward on page 3



What Is Division?

Division is the procedure for cutting a selected page and the pages thereafter and adding them to a new subprogram. In the figure above, if "C" on page 3 is selected, the original program will have two pages: "A" and "B," and the newly generated program will have three pages: "C," "D" and "E."

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4-5 Menu Operations

4-5-1 File Menu

Move to other modes. The current mode is shown with a check mark. Modes that are unavailable are grayed out.



4-5-2 Edit Menu



Page	47/100	Symbol
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4-5-3 Find

Searches for data with the name that you specify.

Find		? ×
Find what:		Eind Next
	Direction	Cancel
	○ <u>U</u> p ● <u>D</u> own	

Find what: Enter the name of data to find.

Direction Up: Search for data with a Circuit Number from -1 Down: Search for data with a Circuit Number from +1

4-5-4 Replace

Substitutes data with the name that you specify.

Origin Place	
	•
Close AutoAllotment ConvertExecute	
Convert Circuit Range Specification	
Start Circuit 1 End Circuit 12	

Function	Content
Close	Closes the package convert window.
Auto Allotment	Automatically allocates the address of the local memory.
Convert Execute	Enter the character string after replacement and the data name after conversion.
Convert Circuit Range Specification	Designate the range of circuit to convert.

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4-5-5 Contact Comment

Displays the window for setting contact comments.

cel 📗
'n

Specify a relay name with two characters (e.g. G0, B0, etc.)

This searches for the contact comments used in subprograms and displays them in a list.

👖 Contact	comment p	ackage inpu	t							2
OntName	Comment	CntName	Comment	CntName	Comment	CntName	Comment	CntName	Comment	Γ
B00000		B00001		B00008		B00048				1
						1				1
	~~ I		. 1	00		000				1
	UK	Ga	ncel	051	/ Kead		V Save	Rela	ay monitor	J

Function	Content
OK	Incorporates the content displayed in the contact comments and then closes the window.
Cancel	Closes the window without incorporating the content displayed in the contact comments.
CSV Read	Reads the contact comments saved in a CSV file.
CSV File save	Saves the contents of the window as a CSV file.
Relay monitor	Monitors the contacts when online. This can be switched on and off with a click in simulation connection.

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4-5-6 Display

Page Change Display Magnification	Changes the display magnific of the circuit.	cation	
CrossReference All Program Cross Re	ference[F11]	- 5% 17% 25%	Display Magnification
Tool Bar(T)	•	40%	magnification is shown with a
Menu	Content	✓ 70%	CHECK Mark.
Cross Reference	Searches for cross reference information within the circuit.	80%	
All Program Cross Reference	Finds cross references concerning all subprograms and subroutines in the project.	90% 100%	
Tool Bar	Select whether to show or hide each tool bar.	110% 120%	

If you do not know the name of a symbol or data in the circuit window, place the mouse pointer on the symbol or data name. A label showing the symbol or data name will appear shortly.



Page	50/100	Symbol
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4-6 Online Circuit

4-6-1 Monitor Mode



Menu functions

Menu	Content
Read	Returns to the Read Mode.
Debugger	Switches to Debugger Mode.
Cross	Finds cross references.
10<>16	Switches the integer data between decimal and hexadecimal.

Display of circuits in Monitor Mode

Item	Content
A-contact	Text turns red when the coil is on, and white when the coil is off.
B-contact	Text turns white when the coil is on, and red when the coil is off.
NOT	Reverses the result of the logic operation input. (red \rightarrow NOT \rightarrow white [text color], white [text color] \rightarrow NOT \rightarrow red)
Coil	Colored according to the coil data irrespective of the result of the logic operation on the left side.
Ruled Line	Represents the result of the logic operation on the left side. The combined line is colored based on the OR condition.

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4-6-2 Monitoring within the Subroutine

Monitor from the reading side

In "Read Mode" or "Monitor," double-click the subroutine symbol and select "Circuit." The subroutine circuit opens.



Selecting from the project tree

Select "Circuit" in the subroutine of the project tree, and select "Monitor." A list appears showing positions that can be read. Select a subroutine to monitor.



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4-6-3 Debug

You can apply the debugging function to the symbol where the cursor is positioned. When debugging is completed, you can cancel the changes if you wish.



About the debugging function

Function	Content
DatWrt	Writes the data.
	Enter the data you want to change. Press [Enter]
Change	Changes the name of the data.
	Enter the name of the data you want to change. Press [Enter] to confirm the data, or [ESC] to cancel it.
Contact ON/OFF	Switches the contact relay ON/OFF.
ConChg	Changes the contact. (A, a-contact B, b-contact, c-contact)
Add	Adds a symbol at the cursor position.
	Symbol Add Enter the name of the data you want to add. H Contact A add Select a symbol to add. NOT add StoreLoad add OK Cancel Cancel Adds the symbol.

Page	53/100	Symbol	
Number	Q	G18721	

Applying the debugger function by double-clicking



Chapter 5 Editing Other Items

5-1 Allocation of the Number of Relays and Registers Used

Sets the amount of local memory used in a subprogram.

[SPG1] RelayRegisterUse Allotmer	nt					3
Relay				_	Register	
			LastNumber		Last	lumber
Auxiliary(B0)	128	÷	B0007F/b00007		IntegerOperationData(mi)	00F
Latch(LS/LR/LC)	16	÷	LS000F		RealOperationData(mr) 64 🗧 mrC	03F
ON-Differential(US/UC)	16	÷	US000F		IntegerConstantData(ki) 16 🔆 ki0	DOF
OFF-Differential(DS/DC)	16	÷	DS000F		RealConstantData(kr) 64 🗧 kr0	03F
ON-Timer(TS/TD)	16	÷	TS000F		IntegerPattern(pi) 0 🗧 pi point p)i
OFF-Timer(TR/TC)	16	÷	TR000F		RealPatten (pr) 0 ÷ pr point p	ır
Counter(NR/NP/NU/ND/NZ)	16	÷	NP000F			
Number of use word 482					OK Cancel	

By defining the numbers of integer patterns and real number patterns, you can define the number of points.



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5-2 Constant Data

Defines the integer constant data (ki), real number constant data (kr), on timer value (TS), off timer value (TR), and counter value (NP) to be used within a circuit. Select items to edit using the tabs at the top.

		(1) D		<i>/</i> 1 \
5-2-1	Integer Data	(ki), Real	l Number Data	(kr)
				()

	Const	ant Data						-	. (115)		
<	IntegerDa	sta(ki)	RealData	i(kr) ON	I-Timer(T)	5) OFF	-Timer(T	R) Col	unter(NP)	Close	
		0/8	1/9	2/A	3/B	4/C	5/D	6/E	7/F	7	
	kr0000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	\Select items to eq	dit using the
	kr0008	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	tabs at the top. C	lick "Close" to
	kr0010	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	close the constar	it data and
	kr0018	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000		

Points to note when setting the constant value

When the constant value is zero, the following is displayed

Integer type (kixxxx): 000000

Real number type (krxxxx): .00000

Example of a constant input

Туре	Content						
Integer	123 (Decimal)	80H (Hexadecimal)					
	-123 (Decimal)	8005H (Hexadecimal)					
Real number	123.4	.12345					
	-123.4	12345					

In order to increase the number of digits that can be input, the zero of 0.xxxx is omitted.

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5-2-2 On Timer (TS), Off Timer (TR)

Consta	ant Data								_ 🗆 ×
IntegerDa	ata(ki) F	RealData(kr)	ON-Ti	mer(TS)	OFF-Time	r(TR) C	ounter(NP)	Close	
	0/8	1/9	2/A	3/B	4/C	5/D	6/E	7/F	
TS0000	00.00S	00.00S	00.00S	00.00S	00.00S	00.00S	00.00S	00.00S	
TS0008	00.00S	00.00S	00.00S	00.00S	00.00S	00.00S	00.00S	00.00S	

Timer value input format

Input format	Content			
00H00M	Sexagesimal	H: Hour	Sexagesimal	M: Minute
00M00S	Sexagesimal	M: Minute	Sexagesimal	S: Second
00.00S	Decimal S: Sec	ond		

5-2-3 Counter (NP)

🔝 Constant Data									
IntegerDa	ta(ki)	RealData(kr)	ON-Ti	ner(TS)	OFF-Time		ounter(NP)	Close	
	0/8	1/9	2/A	3/B	4/C	5/D	6/E	7/F	
NP0000	0	0	0	0	0	0	0	0	
NP0008	0	0	0	0	0	0	0	0	

Counter value setting range

0 to 65535

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5-3 Pattern Data



Button functions

Button	Content
OK	Updates the pattern data and closes the window.
Cancel	Closes the circuit window without applying any changes.
CSV Read	Enters pattern data from a CSV file in the P and Q fields of the pattern data. The "Open a File" dialog box appears. Select the file name.
CSV Save	Saves the P and Q pattern data as a CSV file. The "Store a File" dialog box appears. Enter a file name.

Chapter 6 IO Allocation

6-1 IO Allocation

IO allocation sets the configuration of the modules for building and operating an FA system using μ GPCsH series. To edit the IO allocation, double-click on the tree node, or right-click and select "Open."



6-2 Editing IO Allocation

6-2-1 Tool Bar Button



Switches to the IO module editing mode.

₿ ⊞	Edit	Mode	•		сомм		
В	ASE	POWER	The	Юс	ompositi	on is read from	
B	HPC-011 ise	SHPC-612 Power	SH CPI	PC-11 U	11	SHPC-012	Base moc

Reads the IO configuration from the μ GPCsH when it is online. The IO configuration cannot be read when the μ GPCsH is encountering a serious failure.

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6-2-2 IO Allocation Screen

M uGPCsH	l IO allocatio	n											
₿ ⊞ Ed	it Mode	🖦 📷 C	омм										
BASE	POWER	CPU	IO1	IO2	IO3	IO4	IO5	IO6	IO7	IO8	IO9	Туре	Name
6HPO-01 Base module 9stot	N 6HPD-612 Power module	(SHPC-I 1) OPU module		SHP0-233 Digtal input 1000000 10msec	SHPC-313 Digital output motodoo 000001 IO,RESET							Scheening SHPC-012 SHPC-012 SHPC-012 SHPC-012 SHPC-012 SHPC-012 SHPC-012 SHPC-012 SHPC-111 SHPC-115 SHPC-1161 SHPC-1164 SHPC-1163 SHPC-1164 SHPC-1183 SHPC-2183 SHPC-2313 SHPC-2313 SHPC-311 SHPC-311 SHPC-315 SHPC-315 SHPC-315 SHPC-315	Base module 9slot Base module 5slot Base module 5slot Power module Stot Power module Extension moduleM 0AD Extension moduleM CPU module R5422 L/F module PROFIBUS master PROFIBUS slave DeviceNet master DeviceNet slave PG emulator module Digital input module16 Digital input module64 Digital input module64 Digital output module16 Digital output module64 Relay output module64
1	2	3	4									SHPC-531 SHPC-535 SHPC-835 SHPC-861 5	Analog input module08 Analog input module08 Pulse inout module06 Pulse inout module06 Pulse inout module02/02

- 1. Base module setting area Set only the base module. The IO setting area changes according to the number of base module slots.
- 2. Power module setting area Set only the power module.
- CPU module setting area Set only the CPU module and extension I/F slave.
- 4. IO setting area Sets the IO module and extension I/F master.
- 5. Module selection area Select modules to mount with the mouse.

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- 6-2-3 Editing IO Modules
- To mount IO modules, switch to Edit Mode and select IO Module Edit Mode.

IO Module Edit Mode



• Drag and drop modules to edit the module configuration.



• Editing IO extensions

First, configure the extension I/F master (SHPC-032) and extension I/F slave (SHPC-033).

SHPC-032 has a termination resistor (SHPC-021), so drag and drop it to connect it to an extension I/F slave (SHPC-033).



Then you can set the wiring of the extension module.

Wire in no more termination resistors (SHPC-021) than

the number of extension I/F slaves (SHPC-033).





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6-2-4 CPU/FL-net/Ethernet Definition

Defines the CPU module

CPU/FL-net/Ethernet definition				
CPU slot(Mount)				
TOOL I/F definition				
baudrate 115200 v bps				
Ethernet definition C Invalidity C Effective				
IP address 192 168 250 32				
Subnet mask 255 255 0				
Gateway address 0 0 0				
PLC command port num(1) ⁵⁰⁷				
PLC command port num(2)				
PLC command port num(3)				
LAN mode AutoNegotiation				
FL-net definition O Invalidity - C Effective				
Network register				
Node name TEST range				
Area 1 address(0-511) Automatic 0 + ??XXXX				
Area 1 size(0-512)				
Area 2 address(0-8191) Automatic 0 * ??0000				
Area 2 size(0-8192)				
Minimum permissible frame(MFT)(0~50 1=10				
Token watch time(TW)(1-255ms)				
OK Cancel				
Oander				

• Ethernet and FL-net definition

Item	Content
IP address	Sets the IP address. The default is 192.168.250.32.
Subnet mask	Sets the subnet mask. The default is 255.255.255.0.
Gateway address	Sets the gateway address.
PLC commandport num (1)	Sets the PLC command port number.
PLC commandport num (2)	
PLC commandport num (3)	
Network register	Sets the network register. Select one of the following in accordance with the specification.
	None, fi, fr, ei, er
Node name	Specifies the local node name. (By default the program name is set.)
Area setting: Sets the transm	ission area of the local node for cyclic data transfer.
Area 1 address (0-511)	Specifies the start address of the local node transmission area of Area 1.
Area 1 size (0-512)	Sets the number of words transmitted by the local node for Area 1.
Area 2 address (0-8191)	Specifies the start address of the local node transmission area of Area 2.
Area 2 size (0-8192)	Sets the number of words transmitted by the local node for Area 2.
Minimum permissible frame (MFT)(0 to 50 1=100us)	The frame interval is the time taken from receipt of a token from another node until the local node outputs a frame. The minimum frame interval is the time that must elapse until each node outputs the minimum frames. The default is $10 \times 100 \ \mu$ s and the setting range is 0 to 50. The unit is $100 \ \mu$ s.
	If you set 0, there is no interval, resulting in maximum operating speed.
Token watch time (TW) (1 to 255 ms)	Sets the time for monitoring the cyclic transmission time using the common memory area. The default is 50 ms and the setting range is 1 to 255 ms.

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Automatic Area 1 address and Area 2 address setting

By specifying the starting station number, the node number of the FL-net module that was mounted during download is read, and "Area 1 address," "Area 2 address" and the start address of the node after the starting station number are calculated automatically. The settings for Automatic Area 1 address and Area 2 address setting as shown below have different meanings.

Note: This only applies when the CPU module is operating normally, or after initialization of the system.

FL-net cyclic data area

Example with 3 as the start of the station number



The start address is (Station number of the mounted module - start of the station number) x Word size.

Item	Content
Area 1 address	Specifies the Area 1 address to calculate automatically.
Area 1 word size	Specifies the number of words transmitted by the local node in common with Area 1 following the start of the station number N.
Area 2 address	Specifies the Area 2 address to calculate automatically.
Area 2 word size	Specifies the number of words transmitted by the local node in common with Area 2 following the start of the station number N.

Example of automatic calculation: When the number of the download destination node is 2

Area 1 start address: $0 + (2 - 1) \times 32 = 32$

Area 2 start address: $0 + (2 - 1) \times 64 = 64$

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6-2-5 Module Parameters

• DI filter settings



DI filter

Sets the filtering time for the DC input module and AC input module.1 msec, 5 msec, 10 msec, 20 msec, and 70 msec can be set (SHPC-253: 10 msec, 20 msec, 70 msec). The setting applies to the following modules.

SHPC-233, SHPC-231, SHPC-235, SHPC-253

• Output keep mode settings

🚮 Digital output	module16		- 🗆 🗵	Output keep mo
1	03 : SHPC-313	3(Mount)		IO HOLD
-Tr_output_module16(terminalstand) Setting Value			When a system r	
o0_register	000001			maintains the out the malfunction if maintains the out
output_keep	IO_RESET	<u>-</u>		the stoppage whi
ОК	IO RESET	Cancel		IO_Reset
				Resets output sta

The setting applies to the following modules. SHPC-313, SHPC-311, SHPC-315, SHPC-333, SHPC-511

de

nalfunction occurs, this mode put status immediately before the CPU module stops, or put status immediately before le the CPU is shut down.

atus when the CPU module

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• Analog input module input setting

🔝 Analog inpu	it module08			- D ×
IO6 : SHPC-531 (Mount)				
Analog_input_	module08(tern	ninalstand)—		
	Regist	Value		
i0_register	i00008			
	i00009			
	i0000A			
	i0000B			
	i0000C			
	i0000D			
	i0000E			
	i0000F			
Setting	-10~10V	-		
	OK	:	Cancel	

Sets the input for the analog input module.

Setting

Voltage input: ±10V, 0-10V, 5V, 0-5V, 1-5V \pm Current input: 0-20mA, 4-20mA

• Analog output module output setting

🔝 Analog out	🖬 Analog output module04 📃 🗖 >					
	IO3 : SHPC-511 (Mount)					
-Analog_outpu	t_module04(ter	minalstand)				
	Register	Value				
o0_register	000010					
	000011					
	000012					
	000013					
Setting	+-10V(+-)	•				
Output_keep	IO_RESET	T				
	ОК	Cancel				

Sets the output for the analog output module.

Setting

Voltage output: 10V, 0-10V, 5V, 0-5V, 1-5V $\pm\pm$ Current output: 0-20mA, 4-20mA

• Mixed module definition

Sets the DI filter and output keep mode settings for mixed modules.

🚮 Digital inout	module32/32		×
	IO8 : SHPC-4	\$11 (Mount)	
Digital_input_Tr	_output_modul	e32/32(connector)	_
i0/o0_register	Register 000014	Value	
	o00015		
	i00016		
	i00017		
Output_keep DI_filter	IO_RESET 10msec	• •	
	ок	Cancel	

The setting applies to the following modules.

SHPC-411

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• RS422 I/F module

🚮 RS422 I/F m	nodule		_ O ×
	IO6 : SHPC-161 (Mount)		
-RS422_I/F_mod	lule		
	CH1 (RS422)	CH2(RS422)	CH3(RS232C)
Mode	_	•	•
Baudrate	•	•	•
Parameter	_	•	•
		OK	Cancel

CH1: RS422/485 Communication port 1 CH2: RS422/485 Communication port 2 CH3: RS232C port

Mode

Set the mode to one of the following.

Mode	Content
POD	Select with the Fuji Electric touchscreen connected.
AIP	Select with the Koyo Electronics Industries (formerly Komatsu) touchscreen connected.
Non	Select when using a function (C_FREE).

Baudrate

Set the baud rate (transmission rate) to one of the following.

1200, 2400, 4800, 9600, 19200, 38400, 57600, 115200 (bps)

Parameter

Set the communication parameter to one of the following.

8-E-1, 8-E-2, 8-O-1, 8-O-2, 8-N-1, 8-N-2

7-E-1, 7-E-2, 7-O-1, 7-O-2, 7-N-1, 8-N-2

Parameter represents (Data bits) - (Parity) - (Stop bits).

Data bits	8: 8 bits
	7: 7 bits
Parity	E: Even
-	O: Odd
	N: None
Stop bits	1: 1 stop bit
-	2: 2 stop bits

Chapter 7 Online Functions

Online functions are performed either from the project tree or from the "Online" menu.

- Functions performed from the project tree
- 1. Trend Graph
- 2. Relay Display
- 3. Register Display
- Functions performed from the "Online" menu
- 4. Download
- 5. Parameter/Program Download (Loading While µGPCsH Is Running)
- 6. System Definition Download (IO Allocation)
- 7. Task Information (Scan Time) Download
- 8. PLC Connection (Upload)
- 9. PLC Reset
- 10. PLC Start
- 11. PLC Stop
- 12. Redundancy Running/Standby Switch
- 13. System Initialization
- 14. PC Card Driver Download
- 15. Compact Flash Storage
- 16. PLC Memory Save/Load
- 17. PLC RAS Information Display
- 18. PLC Clock Setup
- 19. Resource Information

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7-1 Trend Graph

7-1-1 Trend Graph

When the trend graph is selected from the tool bar or by right-clicking the project tree, the trend window shown below appears, showing the selected register and the trend graph of relays in real time.



Right-clicking in the trend window displays the following menu.

Menu	Content
<u>S</u> top Ctrl+N	Pauses the trend graph.
<u>R</u> uled line display	Draws ruled lines in the trend graph.
Edit of register display item	Changes the register sampled.
Edit of relay display item	Changes the relay sampled.
<u>T</u> rend Graph End	Quits the trend graph.

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7-1-2 Trend Menu

The following functions can be accessed from the trend menu (tool bar).

File menu	Item	Content
Stop Ctvl+N	Stop	Stops the trend graph.
	Print	Prints the trend graph.
🍓 Print	Save to BMP file	Saves the trend graph as a bitmap file.
🙀 Save to BMP file	Save to CSV file	Saves the data sampled for the trend graph in a
ିଙ୍କ Save to CSV file		CSV file.
Continuation CSV file saving	Continuation CSV	While the trend graph is in operation, CSV files
Trend Graph End	file saving	are generated continuously for each number of
		samples specified.
	Trend Graph End	Quits the trend graph.

Saving to a CSV file

After specifying a file name, the following dialog box appears. Set the parameters required and save the sampled data in a CSV file.



Continuously saving CSV files

While the trend graph is in operation, CSV files are generated continuously for each number of samples specified.

File name: (Specified filename) 1.CSV, (specified filename) 2.CSV etc.

Trend function "Edit" menu

Edit Menu	Content	
Edit of register display item	Changes the settings of the register sampled by the trend graph.	
Edit of relay display item	Changes the settings of the relay sampled by the trend graph.	
Editing the sampling time	Specifies the time for trend graph sampling. It can also be set with the tool	
	bar below.	
	Sampling Time 100 - [ms]	
	The setting range is 100 ms to 10000 ms (10s).	

Trend function "View" menu

View menu	Content	
Ruled line display	Displays ruled lines in the trend graph. Also displayed by clicking	
	iii on the tool bar	

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7-1-3 Register Display Item Edit

Changes the settings of the register sampled by the trend graph.



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7-1-4 Relay Display Item Edit

Changes the settings of the relay sampled by the trend graph.



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7-2 Relay Display

Relay Display[SPG1]						_0>		
	FEDC	BA98	7654	3210	(HEX)	(DEC)		
B00000	0000	0000	0000	0000	OH	0		
B00010	0000	0000	0000	0000	44H	68		

Enter the relay name in the input field (leftmost grid). Press the [Enter] key and a relay name +16 is automatically set in the next line. Relay names are displayed in 16 point units, therefore the last digit cannot be set. To change the relay name, press the [F2] key.

(Red) indicates that the relay is on.

(White) indicates that the relay is off.

Note: Refreshing the display takes longer as the amount of data displayed increases.

Menu bar	Submenu	Content			
File	Relay display completed	Closes the relay display.			
Edit	Delete 1 line in the	Deletes 1 line in the relay display.			
relay display		The settings of the cursor line are cleared and the lines below that line are moved up. If it is the last line, only the settings of the line are cleared.			
	Contact ON/OFF	Switches the contact on and off. When this is checked, the contact can be switched on and off by clicking the relevant data.			
		Blue shows that a relay for changing from off to on is selected.			
		Green shows that a relay for changing from on to off is selected.			

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7-3 Register Display

Register Display[SPG1]									
	+7	+6	+5	+4	+3	+2	+1	+0	
mi0000	0	0	0	0	0	0	0	0] ─
mi0008	0	0	0	0	0	0	0	0	1
mr0000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	1
mr0008	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	1
I									
									1
									- -

Enter the register name in the input field (leftmost grid). Press the [Enter] key and a register name +8 is automatically set in the next line, but you can change this freely. Eight data items are displayed per line. To change the register name, press the [F2] key.

Note: Refreshing the display takes longer as the amount of data displayed increases.

Menu bar	Submenu	Content	
File	Hexadecimal display	Switches the integer data between decimal and hexadecimal. When the menu displays a check, the display is hexadecimal.	
	Register display completed	Closes register display.	
Edit	Delete 1 line in the register display	Deletes 1 line in the register display. The settings of the cursor line are cleared and the lines below that line are moved up. If it is the last line, only the settings of the line are cleared.	
	Data change	When this is checked, the register value at a position where you right-click is changed and sent to the μ GPCsH.	
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7-4 Download

Downloads all currently open projects to the μ GPCsH. During the download, the μ GPCsH is stopped and reset when downloading finishes.

7-5 Parameter/Program Download (Loading While μ GPCsH Is Running)

Downloads all currently open projects to the μ GPCsH. This is also possible if the μ GPCsH is operating.

Caution is required for parameter/program download (loading while μ GPCsH is running) when the time series function is operating. Refer to 7-20.

7-6 System Definition Download (IO Allocation)

Downloads the system definition (IO allocation). When downloading finishes, the μ GPCsH is reset.

7-7 Task Information (Scan Time) Download

Downloads only the scan time. When downloading finishes, the μ GPCsH is reset.

7-8 PLC Connection (Upload)

Upload a project from the μ GPCsH.

7-9 PLC Reset

Resets the μ GPCsH.

7-10 PLC Start Starts the μ GPCsH.

7-11 PLC Stop

Stops the μ GPCsH. (It can be stopped even when the switch on the front is set to "RUN.")

7-12 Redundancy Running/Standby Switch

This function is only available with the μ GPCsx.

7-13 System Initialization

Clears the memory in the μ GPCsH. This clears the user memory, removing all applications completely. Therefore you should be very careful when performing this operation.

7-14 PC Card Driver Download

This function is only available with the μ GPCsx.

7-15 Compact Flash Storage

You can copy a project image onto CompactFlash storage and by inserting the CompactFlash in the CPU module, you can load the project in the μ GPCsH. This is an alternative to downloading projects from the tool interface.

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7-16 PLC Memory Save/Load

You can read data from the memory in the PLC and save them as files, and read files and save them in the memory in the PLC.

	PLC me	(1) emory save,	/ (/load.	2)	(3)				
1	Memory k	ind(Data fo	r upload or	download	from PLC)				
	e0 🔽	0000	15	num	File open	PLC Upload	CSV File open	Cancel	
	gO er ri			_	File save	PLC Download	CSV File save		
A	rr i0 o0								
L									
L									
L									

7-16-1 Memory Type

- (1) Specifies g0, gr, ri, rr, i0, o0.
- (2) Specifies the start offset of the relevant memory.
- (3) Specifies the number of the relevant memory.

7-16-2 Button Functions

Button	Function		
File Read	Opens binary files saved with "File save."		
File Save	Saves data displayed in the window as a binary file.		
PLC Upload	Reads the memory specified with "Memory type" from the PLC.		
PLC Download	Writes memory data displayed in the window to the PLC.		
CSV Read	Opens CSV files saved with "CSV File save."		
CSV File Save	Saves data displayed in the window as a CSV file.		
Cancel	Closes the window.		

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7-17 PLC RAS Information Display

Retrieves and saves PLC maintenance information.

7-17-1 RAS Information Display Window



- (1) Select the target for RAS Select the target for RAS
- (2) RAS history Information for the μ GPCsx.
- (3) System history History IO slot If "System history" is selected for RAS, select the relevant CPU or IO slot.
- (4) RAS information display area Displays RAS information.
- (5) Detailed information display area Displays detailed RAS information.
- (6) Operation status Displays the CPU status (RUN/STOP).
- (7) Other information

```
Switch information and CPU Information for the \muGPCsx. TERM is always displayed when the \muGPCsH is connected.
```

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(8) Button functions

Button	Function
Update	Updates the RAS information.
Close	Closes the RAS information display.
Connect Setup	Sets the connection path.
Save	Saves the RAS information.
Contents clear	Clears the history the main unit when "System history" is selected for RAS.

7-17-2 RAS Target

MI PLC RAS Information Display			
SwitchInf TERM CPU No 0 CPU_module CPU_module detail CPU_module detail Type information Power supply interception_history_ir Fatal fault, time/Start_time	History IO slot NowRAS 💌 OPU 💌 Detailed info	Update Close ConnectSetup Save	Contents clear
SystemInstory FL-netStatus(CPU) FL-netStatus(FL-net(fi))			
Operation Status RUN			

The following types of RAS target can be selected.

Item	RAS target	Content	
1	CPU module	Displays the current status of the CPU module.	
2	CPU module detail	Displays detailed RAS information for the CPU module.	
3	Type information	Displays type and version information for the CPU module.	
4	Power supply interception history	Displays the last sixteen occurrences of CPU activation time and power discontinuity time.	
	information	(Cleared by downloading.)	
5	Fatal fault time/Start time	The fatal fault time is displayed, or when no serious failure has occurred, the system activation time.	
6	System history	Displays system operations and error history.	
		The system history in the CPU module is erased with the "Contents clear" button or by right-clicking and selecting "Contents clear"	
7	FL-net Status	Displays FL-net status information.	
		(Specified with the register name set.)	

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7-18 PLC Clock Setup



Performs maintenance of the clock in the μ GPCsH.

7-19 Resource Information

Displays task execution information in the μ GPCsH and the amount of memory used.

			_	Specifies the task.
esource Information				IO refresh period = 0
			-	Task 1 = 1, Task 2 = 2
Task Level 1	•	Max(us)	Min(us)	Task 3 = 3, Task 4 = FE
Starting Cycle Present(us)	1031	1031	957	
Starting Cycle Maximum(us)	1037	1047	1033	Displays the task starting \sim cycle in units of μ s.
Starting Cycle Minimum(us)	944	951	940	
Execution Time Present(us)	265	288	208	5
Execution Time Maximum(us)	287	292	276	Displays the task execution
Execution Time Minimum(us)	201	201	201	time in units of μ s.
Memory Size	587% remain %d		Clear	
			lose	Sets the amount of program memory used in the µGPCsH

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7-20 Cautions for Parameter/Program Download (Loading While μ GPCsH Is Running)

The time series function operation buffer is identified by the number (the number counted from the top of the tree), row position and column position of the subprogram containing the function. If the page number, row position or column position has changed significantly, the time series function restarts from 0. The following transfers are recognized automatically so that operation is normal.



- (1) **Only transfer of the row position** in the same column, on the same page.
- (2) **Only transfer of the column position** in the same row, on the same page.
- (3) **Only transfer of the page** with the same column and the same row.

With changes in the time series function other than above, it restarts from 0.

When adding and removing subprograms, the local memory changes, therefore <u>you should not perform</u> <u>loading while μ GPCsH is running</u>.

Reference: Time series function list

Differential compensation	Phase compensation	PI compensation	ARC	S-ARC	Filter
<u>_</u>	<i>0</i>	-12	-2-	-12-	-6-
PID compensation	Temporary delay	Delay	Constant frequency pulse	Hysteresis	
-Ľ-	-6-	— <u>—</u> —	<u> </u>	- <u>L</u> -	
Unconditional subroutine	Conditional subroutine				
	XXXXXX ——SB				

On timer	Off timer	On differential	Off differential	Backlash	Backlash compensation
TSTD	TRTC	USUC	DSDC	BKLS	BKLC
— F	— 🗗 —	— F	— F	— F	— F

Chapter 8 Printing

8-1 Overview of Printing

The printing functions of TDFlowEditor are shown below.

- Printing circuit lists
- Printing parameters
- Printing project relations
- Printing cross references
- Printing contact comments

8-1-1 Operating Procedure

Select "Print" from the File menu of TDFlowEditor to display the following detailed printing screen.



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8-1-2 Checking and Changing Printer Settings

Selects the default printer to use.

Procedure for selecting a printer

On the print setting screen, click "Print Setup" to display the Print Setup dialog box.

Pı	int Setup			<u>? ×</u>
	Printer —			
	<u>N</u> ame:	FX DocuCentre Color f450	_	<u>P</u> roperties
	Status:	Ready		
	Туре:	FX DocuCentre Color f450		
	Where:	IP_172.16.4.240		
	Comment:			
	- Paper		C Orientation	n
	Si <u>z</u> e:	A4 (210 x 297mm)		Portrait
	<u>S</u> ource:	According to Printer SetAuto	Α	O L <u>a</u> ndscape
	Net <u>w</u> ork		OK	Cancel

Printer Name: Select a printer from the list box.

Set "Paper," "Orientation," "Properties" as necessary and click "OK."

8-1-3 Figure Frame Settings

Selects whether to print a figure frame when printing items selected with "Print" (circuit list, system configuration definition, parameters, cross reference, contact comment, project relations [project tree, memory transfer definition and trace back]).

Clicking "Figure Frame" displays the following items.

FigureFrame	Not use 💌
	Not use
	Use

Item	Content
Not use	No figure frame is printed.
Use	A figure frame is printed.

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8-2 Individual Printing

You can select individual items such as circuit lists and system definitions to print.

8-2-1 Circuit List Printing

Prints the circuits of selected programs.

Each program created in the project (Task 1, Task 2, Task 3, Task 4, Subroutine) is displayed.

Oircui	itList—			
<u>O No</u>	o print	• F	rint	
		Start	End	
ØS	PG1	1	1	
⊠S	PG2	1	1	
ØS	PG3	1	1	
⊠S	UB-1	1	1	
Optior	n			Comment
Optior Intege	n er data			Comment 💌 DecimalPrint 💌

The following functions are added when printing circuits.

Item	Content	
Option	Comment	Prints the circuit list without modification.
	Cross Reference	Prints the cross reference of coils stored under contacts.
	Space	Nothing is printed under contacts.
Integer data	Decimal Print	Prints the integer data in the circuit in decimal format.
	Hexadecimal number printing	Prints the integer data in the circuit in hexadecimal format.
Direction	1 circuit in sheet	Prints one circuit with a landscape orientation.
	2 circuit in sheet	Prints two circuits with a portrait orientation.

Note: Figure Frame can only be used with landscape printing.

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8-2-2 Project Relation Printing

Prints the IO allocation, project tree, etc.

ProjectRelation O No print I Print	
♥ IO allocation ♥ CPU/Ethernet/FI-net setting ♥ Project Tree ♥ Register Comment	
IO parameter of a system configuration definition is also printed	

Item	Content
IO allocation	Prints the content of the configuration set with IO allocation.
CPU/Ethernet/FI-net setting	Prints the content set with CPU/FL-net/Ethernet Definition.
Project tree	Prints the project tree.
Register Comment	Prints register comments.

8-2-3 Parameter Printing

Prints the number of programs used and values of parameters.

Each program created in the project (Task
1, Task 2, Task 3, Task 4, Subroutine) is
displayed.



Item	Content
Number of parameters used	Prints the number of parameters used in the programs used.
Values of parameters	Prints the values of parameters (ki, kr, TS, TD, NP) used in a program.

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8-2-4 Cross Reference Printing

Prints the cross references of selected programs.

Each program created in the project (Task 1, Task 2, Task 3, Task 4, and Subroutine) is displayed.

8-2-5 Contact Comment Printing

Prints the contact comments of selected programs.

Each program created in the project (Task 1, Task 2, Task 3, Task 4, and Subroutine) is displayed.

CrossReferen	ce	
🔿 No print	O Print	
SPG1 SPG2 SPG3 SUB-1		



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Chapter 9 Tools Menu

9-1 Environment Setup

9-1-1 Setup Color

Changes the colors used on the screen. Right-click items to display the Setup Color dialog box where you can select colors.

Environment Setup	×
Setup Color Tool Setup ConnectCom Setup	
CircuitFont	
CircuitBackground	
DircutLine	
DircuitMonitorValue	
TrendFont	
TrendBackground	
TrendLine	
TrendGraphLine	
CrossRefStore	
CrossRefArgument(Input)	
DrossRefArgument(Output)	
To Default Close	

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9-1-2 Tool Setup

Makes various settings used in TDFlowEditor.

Environment Setup	(1)
Setup Color Tool Setup ConnectCom Setup	
Double coil is checked during circuit edit.	(2)
Number of trend retain memories 255	
CF card preservation	(3)
C Package(For past compatib) 4095 8191	
Close	

(1) Double coil is checked during circuit edit.

If there is a double coil, the following dialog box appears.

CircuitEdit		×
?	Double coil is used.(Error No.388)(B00001 CircuitNo.: Is it OK?	1 LineNo.: 2)
	(北い)(1)(1)(1)(1)(1)(1)(1)(1)(1)(1)(1)(1)(1)	

(2) Sets the number of trend retain memories.

Increasing the size increases the sampling capacity which in turn increases the capacity that can be saved in a CSV file.

(3) Selects the method of saving to a CompactFlash (CF) card. (This setting is only for the μ GPCsx.)

- Division
- Package (For past compatibility)

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9-1-3 Communication Settings with the Connected Device

Determines the method of connecting the μ GPCsH and TDFlowEditor.

- COM Port Used when connecting the μGPCsH with the COM port (serial port) of the PC. This setting should also be used when connecting the μGPCsH with USB.
- Ethernet

You can also use TDFlowEditor with Ethernet by inserting a cable in the LAN terminal of the μ GPCsH CPU module. Set the IP address and port No. of the μ GPCsH.

• Modem

Used when connecting the μ GPCsx with a modem.

• USB

Used when connecting the μ GPCsx through the USB port.



Communication conditions

Timeout: Specifies the time before resending after a transmission error with the μ GPCsH. Data size: Set to 492 bytes with the μ GPCsH.

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9-2 Write Mode Customize

With write mode customization you can specify shortcut keys (accelerator keys) for the Write Mode of the circuit window. Select a shortcut key from "Write mode ability" to set and select a shortcut key in "Shortcut key: Setup."

To set a sl	hortcut key, select from "Write mode ability."	
Mitte Mode Customize	×	
Write mode shortcut key		
Write mode ability	Shortcut key	
&Select	Displays the shortcut key current	lv set.
&CutOff C&opy	Ctrl+X	. <u>,</u>
&Paste	Otrl+V	
&LnIns		
L&nClr Ln∇		
Connector_load		
Shortcut key : Setup	rI+K	
ОК	Cancel	
	Select a shortcut key.	
	$\sqrt{2}$	
Shortcut key : Setup		
OK Ctrl+ Ctrl+	+A +B +C	
Ctri Ctri Ctri	+D +E +F +G	

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9-3 Trace Back

Using the trace back function allows you to perform detailed analysis of partial sections of continuous data. First set any of the trigger relays you specified earlier to on. Then only 100 data points prior to and after turning on the trigger register are retained. You can then load and analyze the sample data values.

Main features

- The sample data can include 16 relays and 15 registers.
- You can specify a maximum of 16 trigger relays.
- You can save a maximum of 16 trace back data items.
- You can specify an interval (interval trace).
- You can specify points to determine the number of samples before and after the trigger.

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9-3-1 Trace Back Settings

M T	raceBa	ck									l ×
	Task	. No.	Disable	•	File rea	d	PLC read				
	Inter	val	1	÷	File sav	/e	PLC save				
	Poin	t(99-2)	50	÷	Close		PLC clear				
_		Mama	Trigger velo	ProgramMan	Mama		Programbla	Mama	Polou	Programblan	-
		ranie	THEE OF TOTAL	Trogramman	rianio	I YOB IS YOI	Trogramma		Thoray	Trogramman	-
(1)			Z000E8			Z00009			Z00090		_
(2)									Z00091		
(3)											
(4)											
(5)											
(6)											
(7)						[
(8)											
(9)											
(10)											
(11)											
(12)											
(13)											
(14)											
(15)											

Operating procedure and setting items

Item	Content
Task No.	Specifies the task for performing trace back sampling. Setting to "Disable" disables trace back sampling.
Interval	Specifies interval tracing (sample). (One sample per n iterations of the task.)
Point	Sets the point to determine the number of samples after the trigger. (With 50, the trigger point is in the middle. The valid range is 99 to 2.)
File read	Reads trace back settings saved with "File save."
File save	Saves the displayed trace back settings in a file.
PLC read	Reads trace back settings from the PLC.
PLC save	Saves displayed trace back settings in the PLC.
PLC clear	Clears PLC trace back settings.
Close	Closes the window.
Name	You can enter an arbitrary character string for the trigger relay.
Trigger relay	Switching this relay from off to on initiates a trigger.
Program Name	Sets the name of the program used for the trigger relay. This setting only applies to local data.
Name	You can enter an arbitrary character string for the register.
Register	Sets the name of the register sampled.
Program Name	Sets the name of the program used for the sampled register. This setting only applies to local data.
Name	You can enter an arbitrary character string for the relay.
Relay	Sets the name of the relay sampled.
Program Name	Sets the name of the program used for the sampled register. This setting only applies to local data.

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9-3-2 Trace Back

1. Trace Back display data selection (Trigger Date)

Selecting "Trace Back Display" with trace back data sampled in the CPU module displays the following window. Select a trigger date to display.

 $\ensuremath{\mathsf{Click}}$ "OK" to display the window for selecting the data to display.

Click "Cancel" to cancel trace back display.



2. Trace Back display data selection

You can select a maximum of 8 registers and a maximum of 8 relays to display. You can change the colors of the graph by clicking 1 to 8 at the right. If you do not know the display data value and cannot decide the maximum and minimum values, check "Max. min. value data setup" to calculate the maximum and minimum register values automatically. To hide the graph, select "Hide."

Click "Close" to go to the trace back display window.

Trace	Back display data selection				×
	Register	Max	Min		RelayName
(1)	Z00009	.00000	.00000	(1)	Is data sample 💌
<mark>(2)</mark>	Is data sample of tre 💌	.00000	.00000	(2)	•
(3)	Is data sample of tre 💌	.00000	.00000	(3)	-
<mark>(4)</mark>	Is data sample of tre 💌	.00000	.00000	<mark>(4)</mark>	-
(5)	Is data sample of tre 💌	.00000	.00000	(5)	-
(6)	Is data sample of tre 💌	.00000	.00000	(6)	-
(7)	Is data sample of tre 💌	.00000	.00000	(7)	-
(8)	Is data sample of tre 💌	.00000	.00000	(8)	-
		🔽 (Max m	in value auto se	tup	Close

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3. Trace Back display

An example of the trace back display window is shown below.



Double-clicking on the graph displays the data reference box. The trigger point and register value at the point of mouse curser are shown.

Right-clicking displays the following menu.

To the trace back display

window

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9-4 USB Driver Setup

To connect TDFlowEditor and the μ GPCsH with a USB cable, the USB driver must be set up. When you connect the μ GPCsH to the PC with a USB cable, the Windows driver installation window appears. Specify the folder below.

	/ The TDFlo	wEditor in	stallation fold	ler	
├── E:\Program Files\TDFlowEditor\v		e folder co	ntaining the	USB driver	
Eile Edit View Favorites Ioos					
Address 🛅 E:\Program Files\TDFlowEdi	tor uGPCsHUSB		1_		🕶 🔁 Go
File and Folder Tasks Image: State of the state of	Mane	5ize 176 KB 4 KB 1 KB 13 KB	Type File Folder File Folder Application Text Document Configuration Settings Security Catalog	Date Modified 2/5/2010 11:53 AM 2/5/2010 11:53 AM 7/15/2008 5:09 PM 7/15/2008 5:09 PM 7/15/2008 5:09 PM 7/15/2008 5:09 PM 7/15/2008 5:09 PM	
Other Places Image: Comparison of the system Image: TDFlowEditor Image: Comparison of the system Image: My Documents Image: Comparison of the system Image: My Computer Image: My Network Places	- Sicherth	5.65		,,, <u>,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,</u>	
Details ¥					

• Installing the USB Driver

(1) When you connect the CPU module of the μ GPCsH to the PC with a USB cable, the "Found New Hardware Wizard" opens. Select "Install from a list or specific location" and click "Next."

Found New Hardware Wizard				
	Welcome to the Found New Hardware Wizard			
	This wizard helps you install software for:			
	CP2102 USB to UART Bridge Controller			
	If your hardware came with an installation CD or floppy disk, insert it now.			
	What do you want the wizard to do?			
	 Install the software automatically [Recommended] Install from a list or specific location (Advanced) 			
	Click Next to continue.			
	< Back Next > Cancel			

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(2) Select "Search for the best driver in these locations." and "Include this location in the search." Click "Browse" and select the folder named uGPCsHUSB.

Found New Hardware Wizard				
Please choose your search and installation options.				
Search for the best driver in these locations.				
Use the check boxes below to limit or expand the default search, which includes local paths and removable media. The best driver found will be installed.				
Search removable media (floppy, CD-ROM)				
✓ Include this location in the search:				
E:\Program Files\TDFlowEditor\uGPCsHUSB				
Don't search. I will choose the driver to install.				
Choose this option to select the device driver from a list. Windows does not guarantee that the driver you choose will be the best match for your hardware.				
< <u>B</u> ack <u>N</u> ext > Cancel				

(3) When the installation is complete, the "Completing the Found New Hardware Wizard" window appears. This completes installation of the USB Driver. Click "Finish" to close the "Found New Hardware Wizard."

Found New Hardware Wizard	
	Completing the Found New Hardware Wizard The wizard has finished installing the software for: Silicon Labs CP210x USB to UART Bridge
	Click Finish to close the wizard.
	< <u>B</u> ack Finish Cancel

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- Checking and changing the COM Port
- (1) Select "Control Panel" \rightarrow "System" \rightarrow "Device Manager."

(2) In "Ports (COM & LPT)," check the item shown in brackets after "Silicon Labs CP210x USB to UART Bridge Controller." In this example, COM3 is used.

🖳 Device Manager	
<u>Eile Action View H</u> elp	
E- 🖳 TOYO-TNFRK4P94F	
🕒 🤠 🥘 Batteries	
📄 🖶 🖳 😴 Computer	
🗄 🥪 Disk drives	
📄 🗄 🖳 📴 Display adapters	
🗄 🥝 DVD/CD-ROM drives	
🔁 🖶 Floppy disk controllers	
🖬 🕀 🖑 Floppy disk drives	
🗄 🔂 Human Interface Devices	
E C IDE ATA/ATAPI controllers	
🗈 🦢 Keyboards	
Er D Mice and other pointing devices	
👔 🕀 😼 Monitors	
E Berner Berne	
🕀 🖳 PCMCIA adapters	
Ports (COM & LPT)	
ECP Printer Port (LPT1)	
Silicon Labs CP210x USB to UART Bridge (COM3)	
H 🐨 Processors	
🗈 🗐 Sound, video and game controllers	
📔 🖬 😼 System devices	

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(3) Double-click "Silicon Labs CP210x USB to UART Bridge Controller (COM3)" and click "Port Settings" to display the following window. In "Advanced...," you can change the COM port number.

Silicon Labs CP210x USB to UART Bridge (COM3) Properties 🛛 🔋 🗙	I
General Port Settings Driver	These settings are not applied even if you change them.
Bits per second: 9000 Data bits: 8 Parity: None Stop bits: 1 Elow control: None Advanced Bestore Defaults OK Cancel	
Advanced Settings for COM3	?×
✓ Use FIFO buffers (requires 16550 compatible UART) Select lower settings to correct connection problems. Select higher settings for faster performance.	OK Cancel
<u>R</u> eceive Buffer: Low (1)	High (14) (14)
Iransmit Buffer: Low (1)	7 High (16) (16)
COM Port Number: COM3	
Vau oon oberge the O	OM nort number
rou can change the C	

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Chapter 10 Simulation Function

TDFlowEditor has a simulation function for performing various validations on application programs on the PC.

10-1 What the Simulation Function Can Do

The simulation function performs the tasks shown below.

- 1. Validation of application programs on the PC
- 2. Validation using the PC serial port
 - (1) Validation of application programs with the PC connected to a POD or AIP touchscreen
 - (2) Validation of the C_FREE function with the PC connected to external equipment
- 3. Validation using the PC Ethernet port
 - (1) Validation of application programs with the PC connected to a POD or AIP touchscreen
 - (2) Validation of the M_OPEN, M_SEND, and M_RECV functions with the PC connected to external equipment
- 4. Validation of multiple applications by running multiple TDFlowEditor programs and running the respective FL-net registers as the same memory.

10-2 Simulation Procedure

In "Online" \rightarrow "Download," select "Simulator" to create application validation data on the PC. Then Circuit Monitor, Debugger, Relay Display, Register Display, Trend Graph, etc., are enabled.

With "Online" \rightarrow "Upload," projects where simulation was used earlier are simulated again.

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10-3 Simulation Function Window

The window below is a virtual execution module for validating application programs.

Application programs are validated using Circuit Monitor, Debugger, Relay Display, Register Display, Trend Graph, etc., in TDFlowEditor. When the window shown below is closed, monitoring the simulation function in TDFlowEditor is not possible.

1. Menu

File menu	Content		
Read IO Data	Reads IO register values saved earlier.		
Store IO Data	Saves IO register values.		
Exit	Exits the virtual execution module. (Normally, the virtual execution module exits when you quit TDFlowEditor.)		
Display unit	Switches the display to the unit extended with the IO extension module. Menu example		

2. Operation switch

Clicking on the part shown below applies the on/off status to the application program control and z0 register.

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- 3. IO module operation
- DIO module

• Multiple word modules such as analog modules etc.

Communication module

Communication data is displayed in a window.

Example

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4. Message field

The message window displays simulation function errors and transmission errors.

• Status bar

RUN*	COM1	192.168.11.3-	topip			Task1 16msec Task2	Omsec Task3 500msec T
(1)	(2)	(3)	(4)	(5)	(6)		(7)

(1) Indicates the status of the simulation function.

Item	Content
RUN* RUN	Indicates that the application program is running normally.
STOP	Indicates that the application program has stopped.
XCHG	Indicates that the application program is being switched.

(2) Indicates the serial port communication status.

Item	Content
COM?	Displays the currently set serial port name.
COM? * COM?	Indicates that the serial port is communicating.
COM? -	Indicates a serial port timeout error.

(3) Indicates the Ethernet communication status.

Item	Content	
???.???.???.???	Displays the IP address set.	
???.???.???.???*	???* Indicates that Ethernet is connected.	

(4) Displays the project name of the application program being validated.

(5) The multiple word module IO register name at the mouse position is displayed.

(6) "Moni" flashes when transferring monitor data with TDFlowEditor.

(7) Displays the scan time of each task

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10-4 Simulation Function Communication Settings

Sets the PC resources used for communication when validating transmission.

🗊 sHSimulator outside equipment communicatio	on setting 📃 🗆 🗙				
Communication outside equipment communication Communication simulation is done. COM Port COM1 Saudra Mode Non Setting	ation setting ate 38400 v 8 8-E-1 v				
Ethernet outside equipment communication setting Image: Ethernet simulation is done. Slot IP address of module Port number Image: Double state					
Network device of communicated PC Broadcom NetLink (TM) Gigabit Ethernet - パケット スケジー					
When simulating it, IP address of PC is added.					
fi Register module(1-255) [1 ei Register module(1-255) [0					
ОК	Cancel				

Simulator outside equipment communication setting	Item	Content
General communication (Using the PC serial port.)	Communication simulation is done.	Check to obtain PC resources (COM port) and enable communication.
	COM Port	Specifies the name of the serial port.
Use the settings for the	Baud rate	Specifies the communication speed.
versatile communications {	Mode	Specifies the mode (protocol).
module.	Setting	Set the communication parameter.
Ethernet	Ethernet simulation is done.	Check to enable Ethernet communication.
Normally, the PC IP address of	Slot	Specifies the slot of the module of the function being validated.
the module do not match, and so for simulation, set	Module IP address	Displays the IP address of the module set in IO allocation.
the PC IP address to that of the module or select "When	Port number	Displays the port number of the module set in IO allocation.
PC is added"	Network device of communicated PC	Specifies the Ethernet port of the PC (board etc.)
	IP address of PC	Displays the IP address of the PC.
	When simulating it, IP address of PC is added.	Adds the module IP address to the OS protocol of the PC.
Reset switchFL-net address sw	fi Register module ei Register module	Set the value of the switch of the CPU module used for the relevant register.

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Contents of this manual are subject to change without notice.