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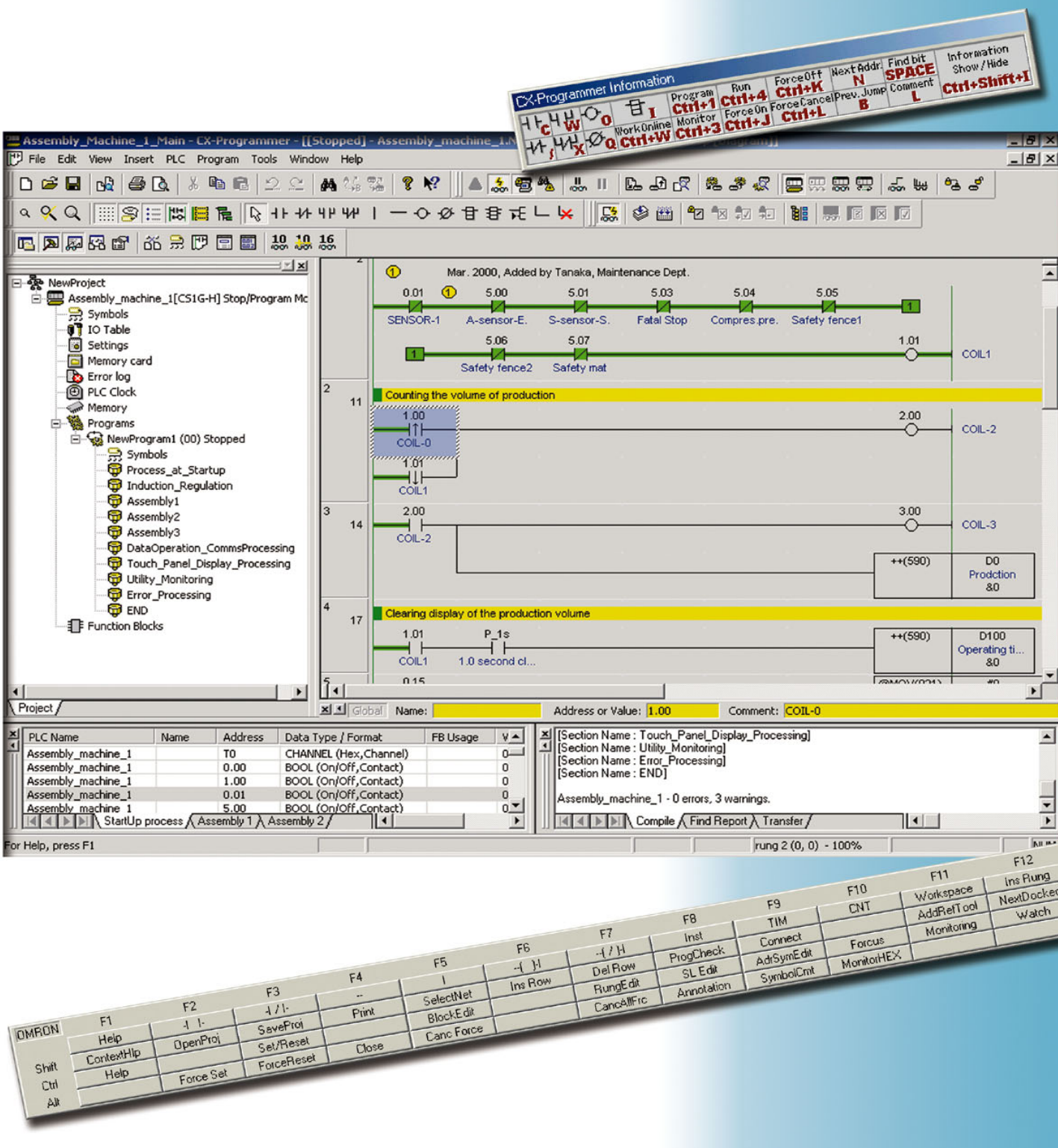
CX-Programmer

Introduction Guide



The CD-ROM of CX-Programmer has User's Manual of the PDF file.
Please read the 'Notice' and the 'Precautions' in the User's Manual before using CX-Programmer.
The 'CX-Programmer Introduction Guide' describes the basic operation procedure of CX-Programmer. Refer to the Help or the User's Manual of the PDF file for detailed descriptions.
* You need Acrobat Reader 4.0 or grater versions in your PC to display the PDF file.

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Available Device Types

CX-Programmer supports the following PLC (Programmable Logic Controller) types.

Series	CPU Unit Type
CS1	CS1H-CPU67/66/65/64/63 (-V1) CS1G-CPU45/44/43/42 (-V1) CS1G-CPU45H/44H/43H/42H CS1H-CPU67H/66H/65H/64H/63H CS1D-CPU67H/65H CS1D-CPU67S/65S/44S/42S
CJ1	CJ1G-CPU45/44 CJ1M-CPU23/22/21/13/12/11 CJ1G- CPU45H/44H/43H/42H CJ1H-CPU66H/65H
C1000H	C1000H-CPU01 (-V1)
C2000H	C2000H-CPU01 (-V1) (Simplex system only)
C200H	C200H-CPU01/02/03/11/21/22/23/31
C200HX C200HG C200HE	C200HX-CPU34/44/54/64 C200HG-CPU33/43/53/63 C200HE-CPU11/32/42
C200HX-Z C200HG-Z C200HE-Z	C200HX-CPU34-Z/CPU44-Z/CPU54-Z/CPU64-Z/CPU65-Z/CPU85-Z C200HG-CPU33-Z/CPU43-Z/CPU53-Z/CPU63-Z C200HE-CPU11-Z/CPU32-Z/CPU42-Z
C200HS	C200HS-CPU01/03/21/23/31/33
CPM2* (*1)	CPM2A-20CD/30CD/40CD/60CD CPM2C-10CD/10C1D/20CD/20C1D
CPM2*-S* (*1)	CPM2C-S100C/110C CPM2C-S110C-DRT
CPM1/CPM1A (*1)	CPM1(A)-10CDR/20CDR/30CDR/40CDR (-V1)
CQM1H	CQM1H-CPU11/21/51/61
CQM1	CQM1-CPU11/21/41/42/43/44/45
CV1000 (*2)	CV1000-CPU01 (-V1)
CV2000 (*2)	CV2000-CPU01 (-V1)
CV500 (*2)	CV500-CPU01 (-V1)
CVM1	CVM1-CPU01/11 (-V1) (-V2)/CPU21-V2
IDSC	IDSC-C1DR-A/C1DT-A
SRM1 (*1)	SRM1-C01/C02 (-V1) (-V2)
SYSMAC Board, or SYSMAC CS1 Board (Internal connection of a PC with the SYSMAC board that is built-in the PC where CX-Programmer is installed)	C200PC-ISA01 (C200HG-CPU43 *3) C200PC-ISA02-DRM (C200HG-CPU43 *3) C200PC-ISA02-SRM (C200HG-CPU43 *3) C200PC-ISA03 (C200HG-CPU43 *3) C200PC-ISA03-DRM (C200HG-CPU43 *3) C200PC-ISA03-SRM (C200HG-CPU43 *3) C200PC-ISA13-DRM (C200HX-CPU64 *3) C200PC-ISA13-SRM (C200HX-CPU64 *3) CS1PC-PCI01-DRM (CS1G-CPU45 *4)

*1: For WS02-CXPC2-EV5 (one license (limited to micro PLCs)), only these PLC types are available.
*2: CX-Programmer does not support SFC.
*3: To connect with SYSMAC Board, specify the PLC types in parentheses. Only when selecting these PLC types, you can select “SYSMAC Board” as a network type.
*4: To connect with SYSMAC CS1 Board, specify PLC types in parentheses. Only when selecting these PLC types, you can select “CS1 Board” as a network type.

Available PC

Hardware Requirements

OS / Item	Windows95/98/NT4.0 Service Pack6	Windows2000/Me	Windows XP
PC	PC/AT Compatible	PC/AT Compatible	PC/AT Compatible
CPU	Pentium-class CPU 133MHz or grater	Pentium-class CPU 150MHz or grater	Pentium-class CPU 300MHz or grater
Memory (RAM) In using CX-Simulator together, values in parentheses	48M bytes or grater (64M bytes or grater)	96M bytes or grater (128M bytes or grater)	128M bytes or grater (192M bytes or grater)
Hard disk space	100M bytes or more free space	100M bytes or more free space	100M bytes or more free space
Display	800X600 SVGA or grater	800X600 SVGA or grater	800X600 SVGA or grater
CD-ROM drive	At least one drive	At least one drive	At least one drive
Communications Port	At least one RS-232C Port		

Recommendation

OS / Item	Windows95/98/NT4.0 Service Pack6	Windows2000/Me	Windows XP
PC	PC/AT Compatible	PC/AT Compatible	PC/AT Compatible
CPU	Pentium-class CPU 450MHz or grater	Pentium-class CPU 450MHz or grater	Pentium-class CPU 600MHz or grater
Memory (RAM)	128M bytes or grater	192M bytes or grater	256M bytes or grater
Hard disk space	150M bytes or more free space	150M bytes or more free space	150M bytes or more free space
Display	1024X786XGA or grater	1024X786XGA or grater	1024X786XGA or grater
CD-ROM drive	At least one drive	At least one drive	At least one drive
Communications Port	At least one RS-232C Port		

Note that CX-Programmer does not work on Microsoft Windows3.1.

The capacity of memory required for operation depends on your program size and OS.
If the capacity of your PC is below the memory required for CX-Programmer, the operation of CX-Programmer may become very slow.

Required memory size:
Calculate the memory required for your program by using the following measuring stick; “memory required for a program of 1k step= 0.5M bytes”, and add it to the memory shown in the above Hardware Requirements table.

Ex. Memory size necessary for downloading a program of 250k steps to CX-Simulator and operating it (OS: Windows2000):

Memory size necessary for operation
= (Memory size shown in the Hardware Requirements table)+ 0.5M bytes x (Program size)
= 128M bytes + 0.5M bytes x 250
= 253M bytes

In this example, the capacity of memory necessary for operation is at least 256M bytes.

Chapter 1
Installation to Startup

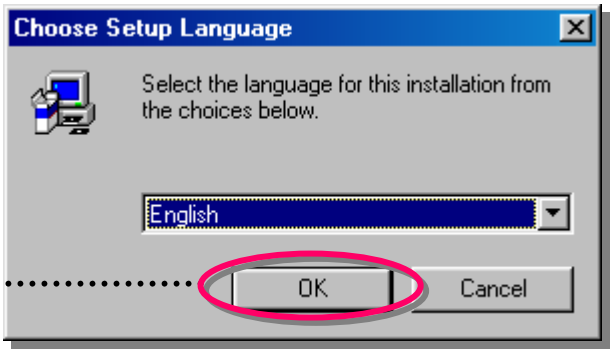
1. Installation

1-1. Installation of CX-Programmer

Follow the below procedure to install CX-Programmer.

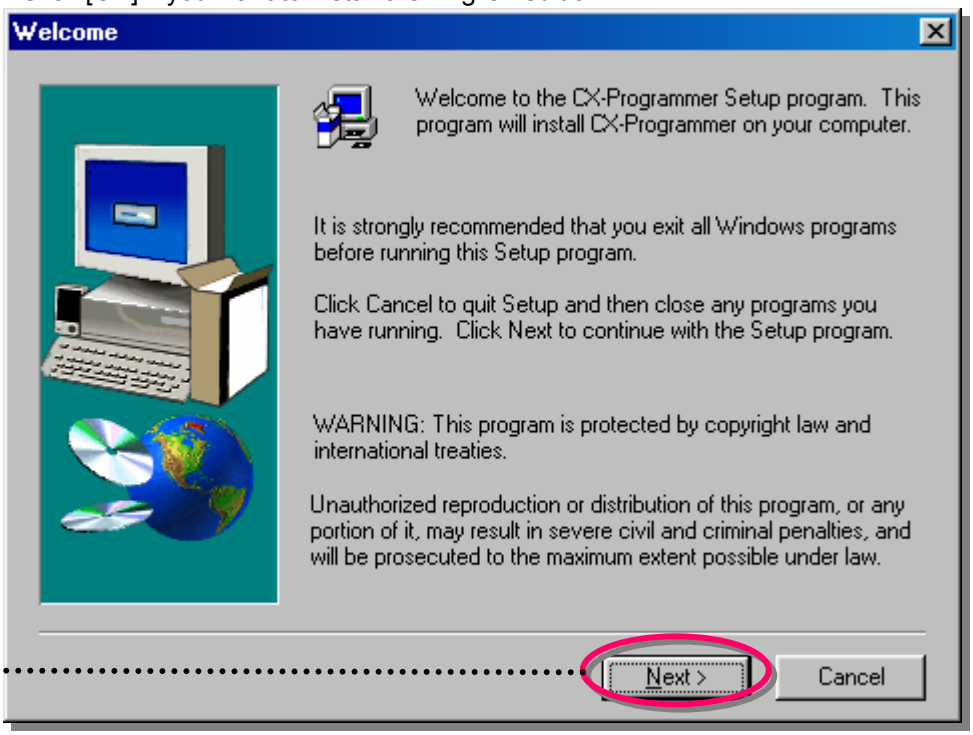
Caution
- Close all Windows programs before installation.
- If an old CX-Programmer is installed, be sure to uninstall the old version before installing Version 5.

1. Insert the installation disk (CD-ROM) of CX-Programmer into the CD-ROM drive of your PC.
   The setup program automatically starts and the [Choose Setup Language] dialog box is displayed.
   If this dialog box is not displayed, double-click the CD-ROM drive on Windows Explorer.



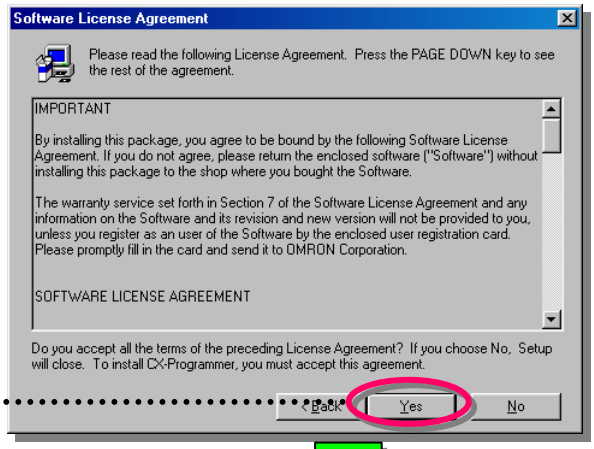
Click [OK].

2. Click [OK] if you want to install the English edition.

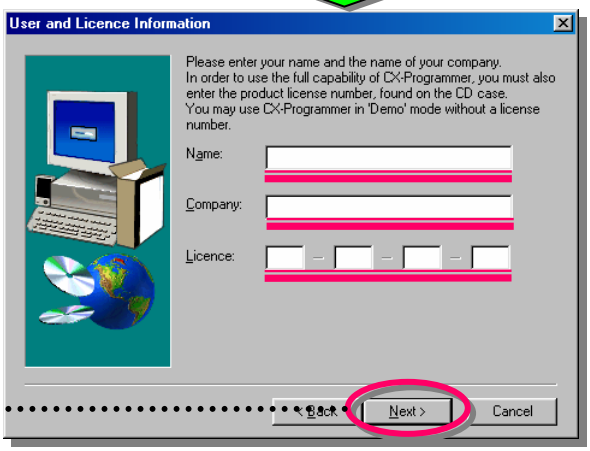


Click [Next].

The [Software License Agreement] dialog box is displayed.



After checking the contents, click [Yes] if you accept all the terms.



Enter
User's name

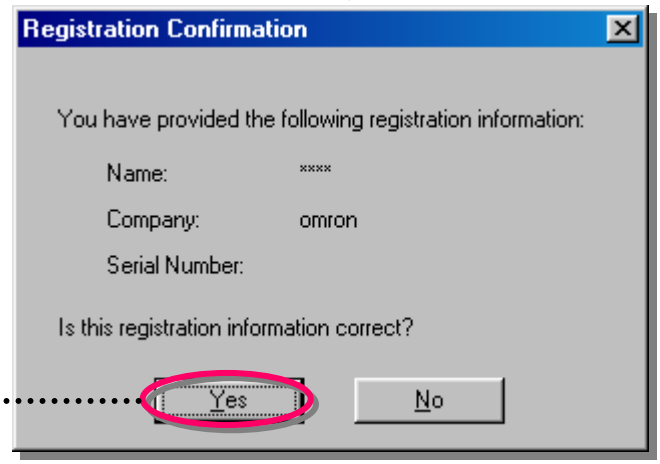
Company name

License No.

Click [Next].

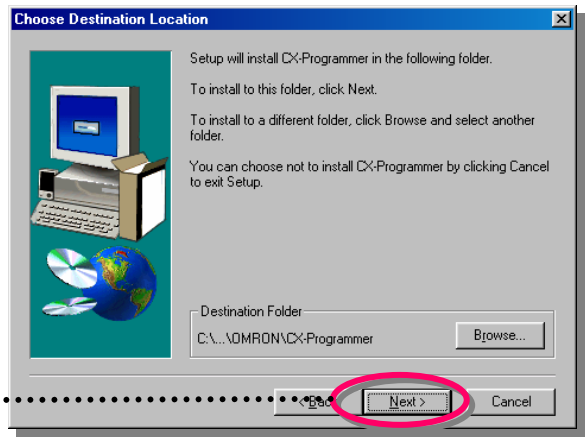
Your license number is shown in the provided Software License Agreement / User Registration Form.

A confirmation dialog is displayed for your name, company name and license number.

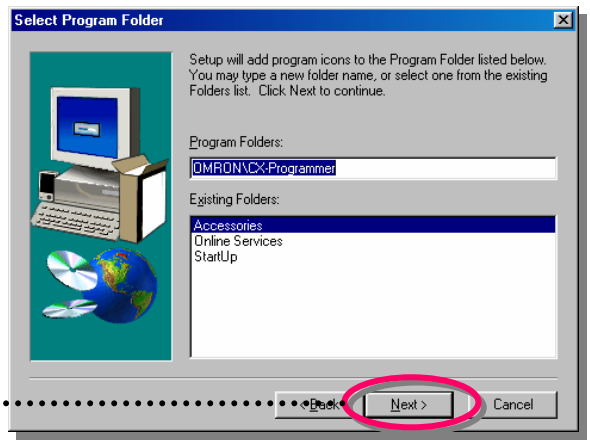


Click [Yes] if all are entered correctly.

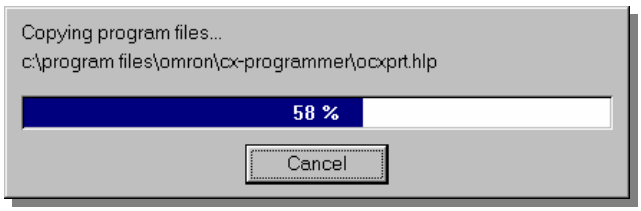
Check the destination location and click [Next].



Click [Next].



The installation program is executed and the files of CX-Programmer are automatically copied under the specified directory.

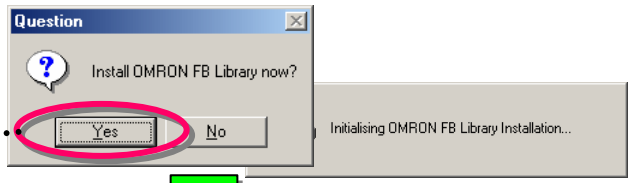


CX-Programmer Ver.5.0 install CD includes the OMRON FB Library setup program. You can choose start setup program for the OMRON FB Library.

OMRON FB Library, or Function Block are available only for CS1/CJ1-H, CJ1M Ver.3.0 or higher CPU.

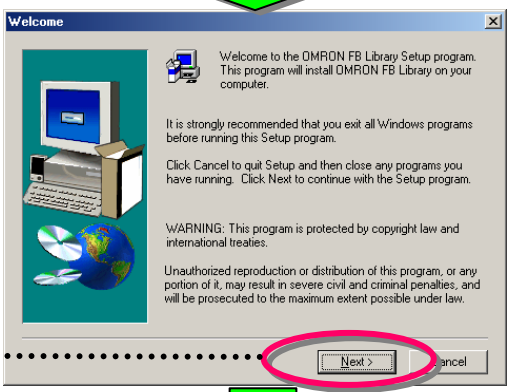
1-2. Installation of OMRON FB Library

Click [Yes].

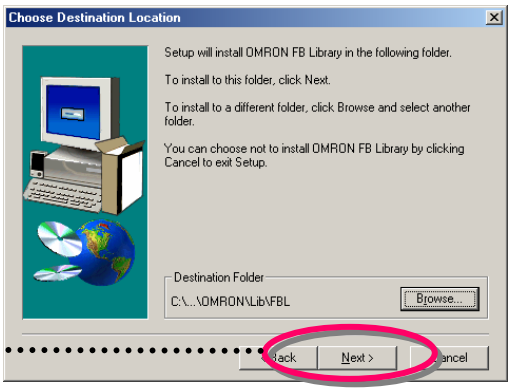


Refer Function Block Introduction Guide for the OMRON FB Library and FB (Function Block) in detail.

Click [Next].



Click [Next].

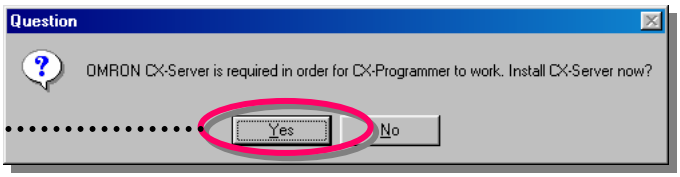


Click [Finish].

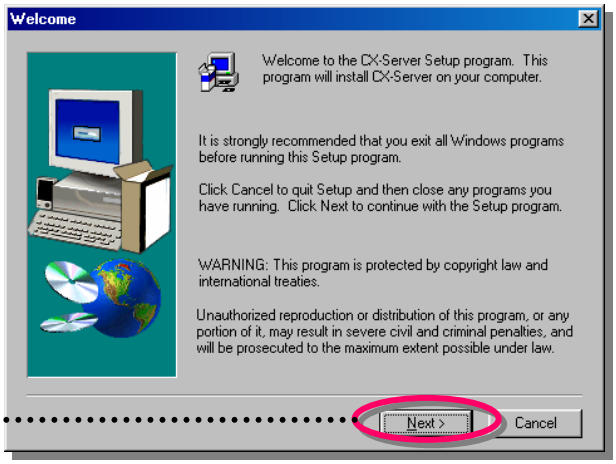
The installation program is executed and the files of the OMRON FB Library are automatically copied under the specified directory.
'Setup Complete' Dialog is shown, then click [Finish] button.

1-3. Installation of CX-Server

Click [Yes].

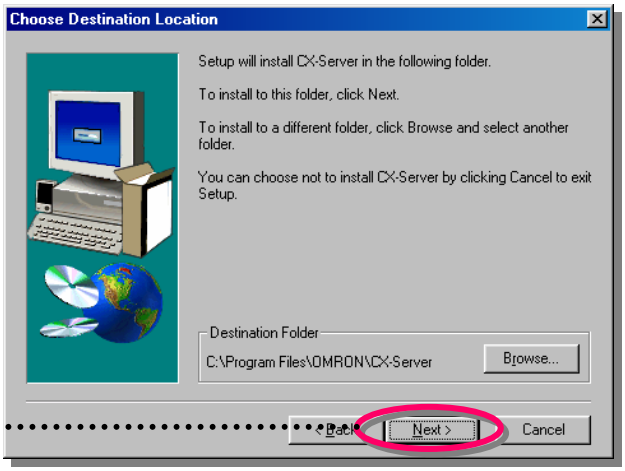


According to your PC environment, a confirmation dialog box may be displayed to prompt you to install Internet Explore Ver.5.5 if Internet Explore Ver.5.0 or greater versions are not installed in your PC. Install it according to the directions on the screen.



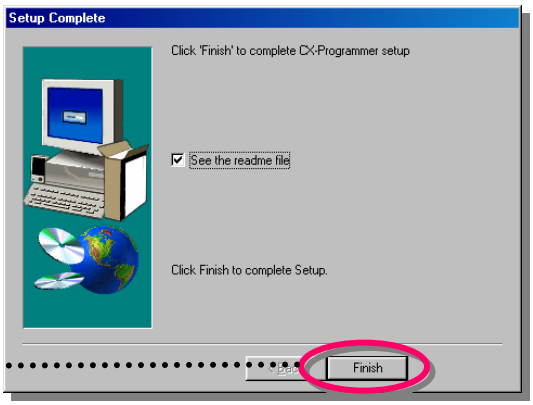
Click [Next].

The [Choose Destination Location] dialog is displayed. Click [Next].



Click [Next].

The installation program is executed and the files of CX-Server are automatically copied under the specified directory.



Click [Finish].

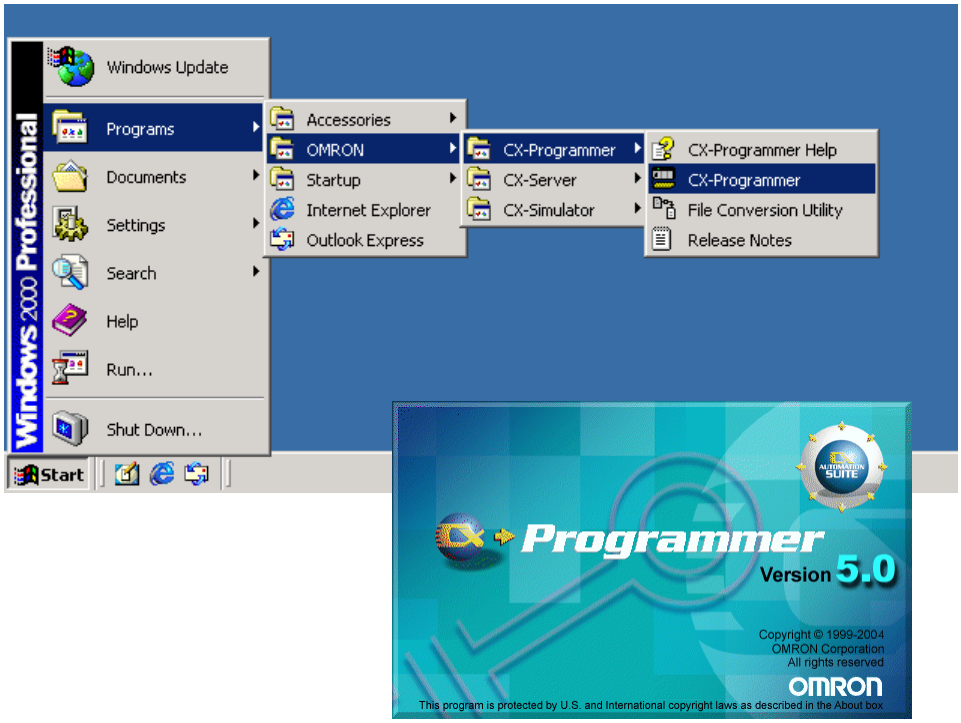
Here is the end of the installation of CX-Programmer and CX-Server.
“Readme file” is displayed.

Before starting to use CX-Programmer, be sure to read “Readme file”.

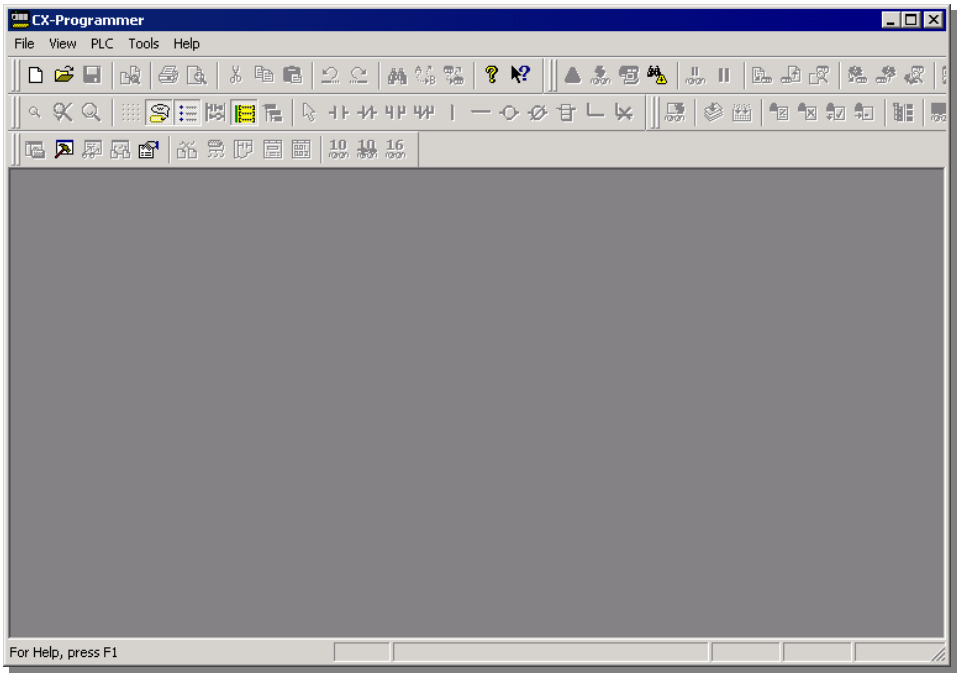
2. Startup of CX-Programmer

Windows task bar

[Start]
↓
[Programs]
↓
Omron
↓
[CX-Programmer]
↓
[CX-Programmer]



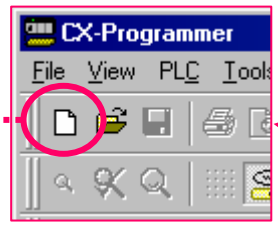
The initial screen when starting up CX-Programmer is displayed.

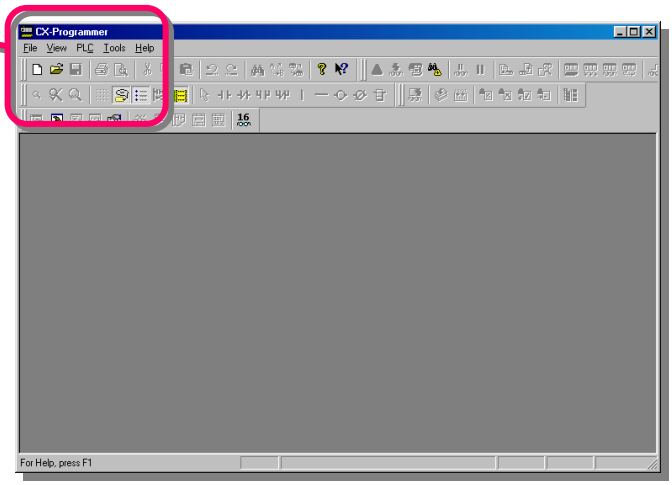


3. New Project Opening and Device Type Settings

Click the toolbar button [New] in CX-Programmer.

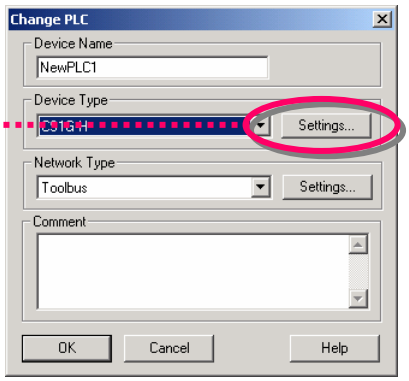
Click 



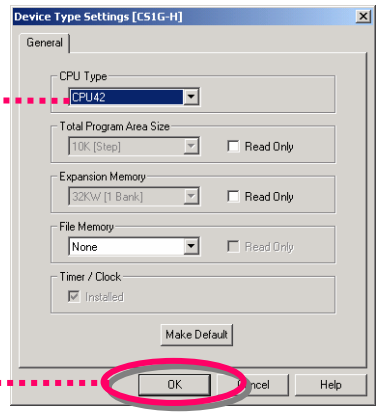


Click the left mouse button.

Settings...



Click the left mouse button on the “Settings” button to show the [Device Type Settings] dialog.



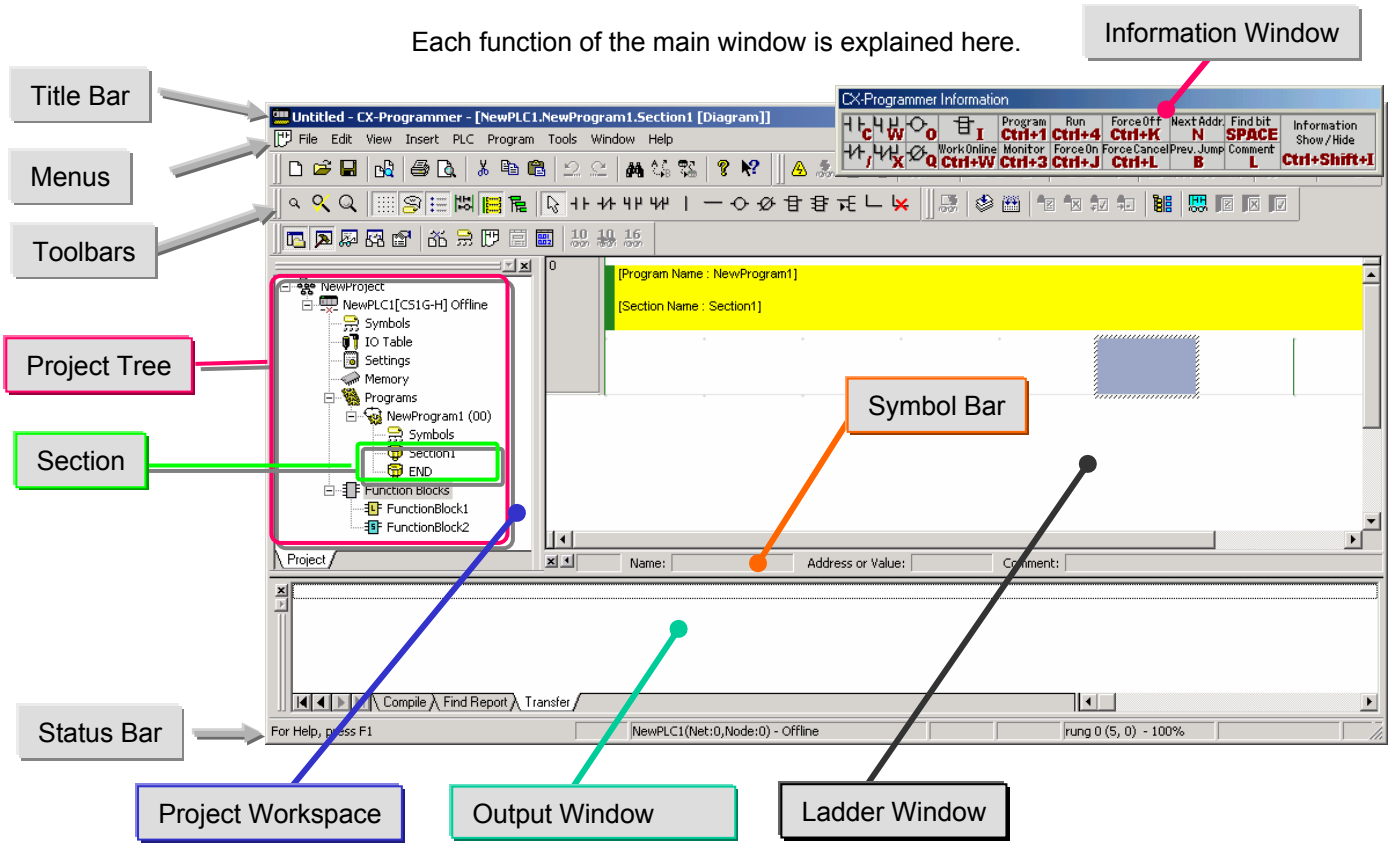
Click the left mouse button on  and select a CPU type.

OK

Click [OK] to decide the selected CPU type.

4. Main Window

Each function of the main window is explained here.



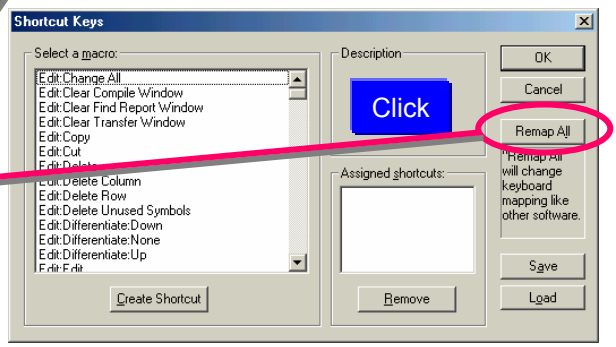
Name	Contents/Function
Title Bar	Shows the file name of saved data created in CX-Programmer.
Menus	Enable you to select menu items.
Toolbars	Enable you to select functions by clicking icons. Select [View] -> [Toolbars], and you can select toolbars to be displayed. Dragging toolbars enables you to change the display positions by the group.
Section	Enables you to divide one program into a given number of blocks. Each can be created and displayed.
Project Workspace Project Tree	Controls programs and data. Enables you to copy data by the element by executing Drag and Drop between different projects or within a project.
Ladder Window	A screen for creating and editing a ladder program.
Output Window	▪ Shows error information in compiling (error check). ▪ Shows the results of searching for contacts/coils in the list form. ▪ Shows error details when errors occurred while loading a project file.
Status Bar	Shows information such as a PLC name, online/offline, location of an active cell.
Information Window	Displays a small window to show the basic shortcut keys used in CX-Programmer. Select [View] -> [Information Window] to show or hide the Information window.
Symbol Bar	Displays the name, address or value, and comment of the symbol presently selected by the cursor.

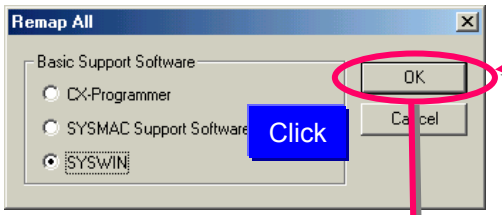
4-1. Compatible SYSWIN Key Allocation

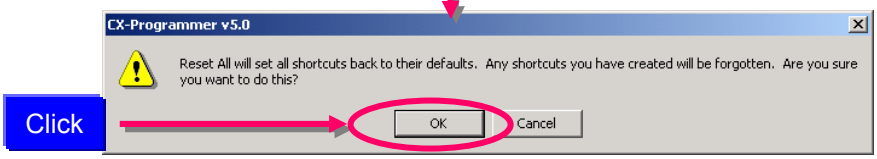
The keyboard mapping function allows the function keys to operate like SYSWIN.

Select the [Tools] -> [Keyboard Mapping...] menu.

Function keys will be available for entering ladder programs.



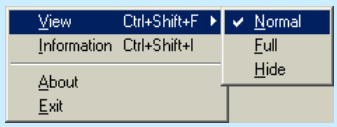




After the above operations, the key allocations will be changed and become compatible with SYSWIN.

When SYSWIN key allocation is selected, a key operation guide will be displayed at the bottom of the display.

Click the icon shown in the task bar on the right-bottom of the display.



Display in Normal View

OMRON	F1	F2	F3	F4	F5	F6	F7	F8	F9	F10	F11	F12
	Help	-| |-	-| / |-	--	|	--( )-|	--(/)-|	Inst	TIM	CNT	Workspace	Ins Rung

When **Shift** is pressed

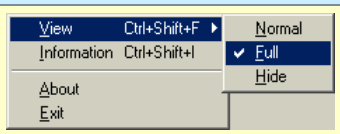
OMRON	F1	F2	F3	F4	F5	F6	F7	F8	F9	F10	F11	F12
Shift	ContextHlp	OpenProj	SaveProj :	Print	SelectNet	Ins Row	Del Row	ProgCheck	Connect		AddRefTool	NextDocked

When **Ctrl** is pressed

OMRON	F1	F2	F3	F4	F5	F6	F7	F8	F9	F10	F11	F12
Ctrl	Help		Set/Reset		BlockEdit		RungEdit	SL Edit	AdrSymEdit	Forcus	Monitoring	Watch

When **Alt** is pressed

OMRON	F1	F2	F3	F4	F5	F6	F7	F8	F9	F10	F11	F12
Alt		Force Set	ForceReset	Close	Canc Force		CancAllFrc	Annotation	SymbolCmt	MonitorHEX		



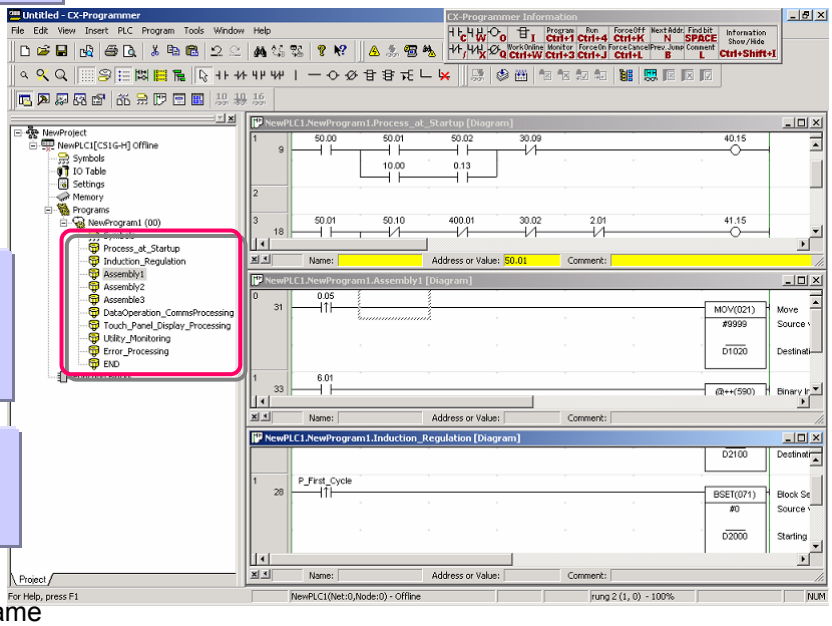
Display in Full View

OMRON	F1	F2	F3	F4	F5	F6	F7	F8	F9	F10	F11	F12
	Help	-| |-	-| / |-	--	|	--( )-|	--(/)-|	Inst	TIM	CNT	Workspace	Ins Rung
Shift	ContextHlp	OpenProj	SaveProj	Print	SelectNet	Ins Row	Del Row	ProgCheck	Connect		AddRefTool	NextDocked
Ctrl	Help		Set/Reset		BlockEdit		RungEdit	SL Edit	AdrSymEdit	Forcus	Monitoring	Watch
Alt		Force Set	ForceReset	Close	Canc Force		CancAllFrc	Annotation	SymbolCmt	MonitorHEX		

4-2. Section

Section is a function to create/display a “block” of a program divided per function. It improves not only the visibility of a program but also the development productivity by reusing components if the program consists of similar controls, because copy and paste on the program tree are available.
Moreover, program upload by section is possible and it enables you to do online operation smoothly.

Example

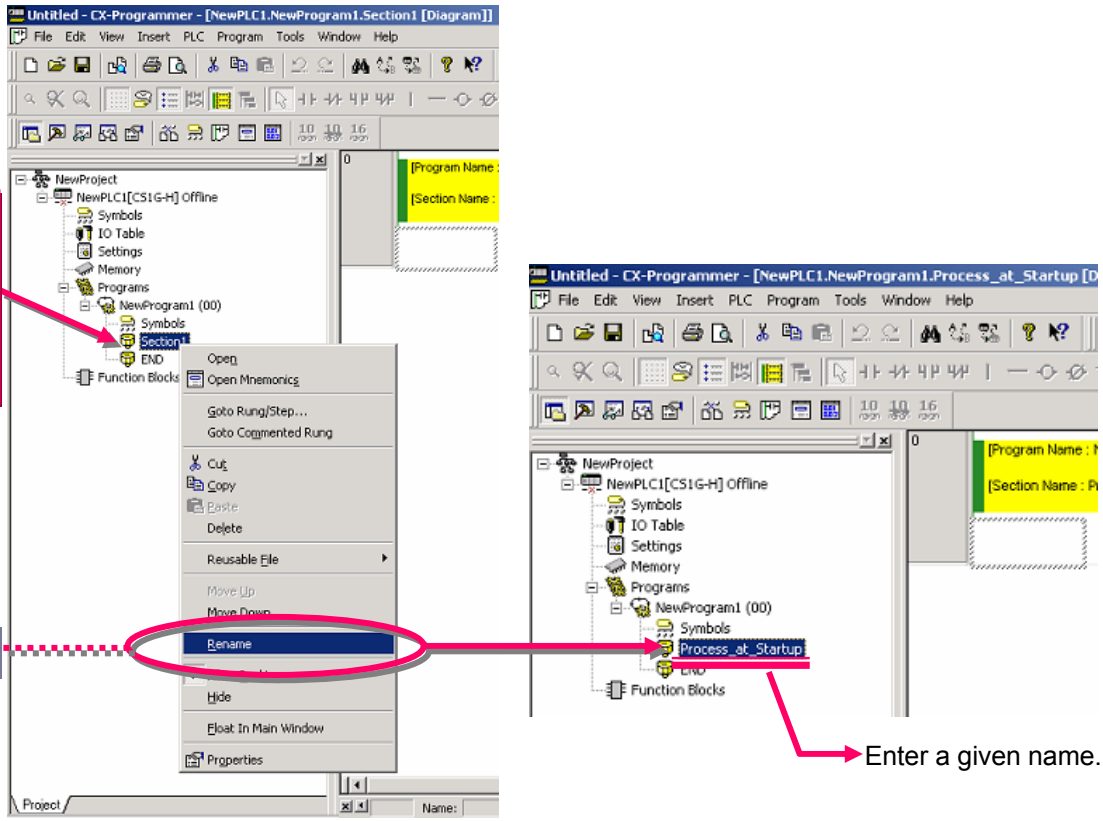


Giving names indicating the contents of processing or controls is possible.

Changing the order of sections and copy & paste are possible by drag & drop with a mouse.

There is no limit on the number of sections per program.

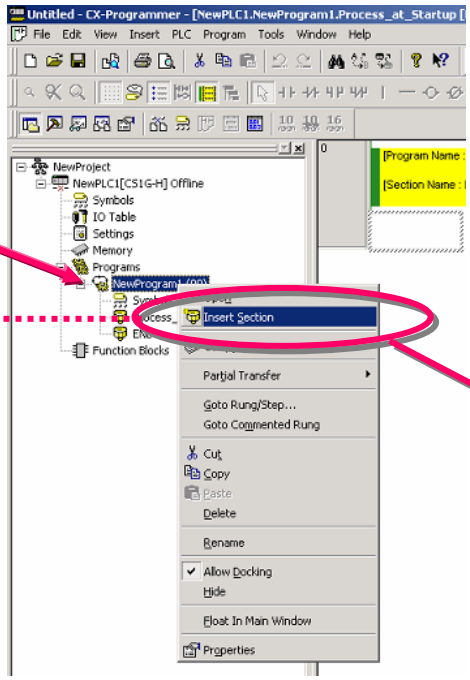
Changing a section name



Click the right button of the mouse on the section whose name is to be changed.

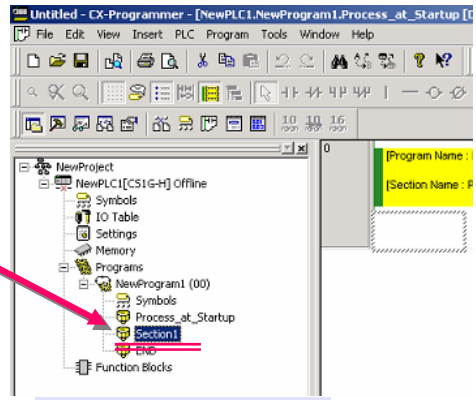
Select [Rename].

Addition of a section



Click the right mouse button on [NewProgram1].

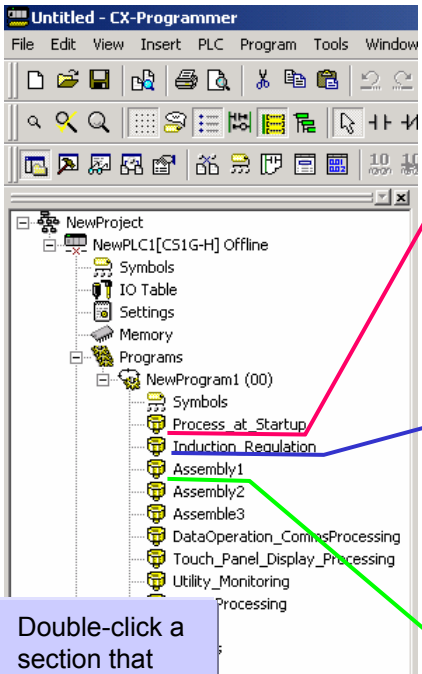
Select [Insert Section].



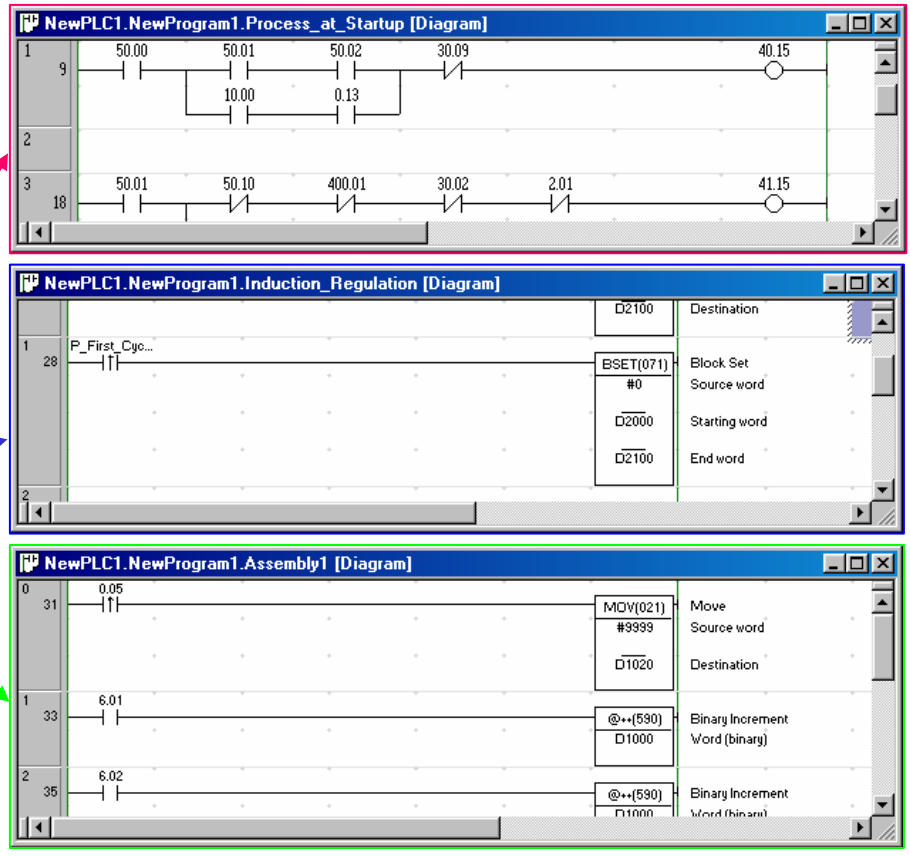
Perform the same operation as the previous page to name the inserted section.

It is possible to go to each section (a ladder block) from a section list.

As checking the global image (control flow) of a program on the section list, you can go to a specified section.

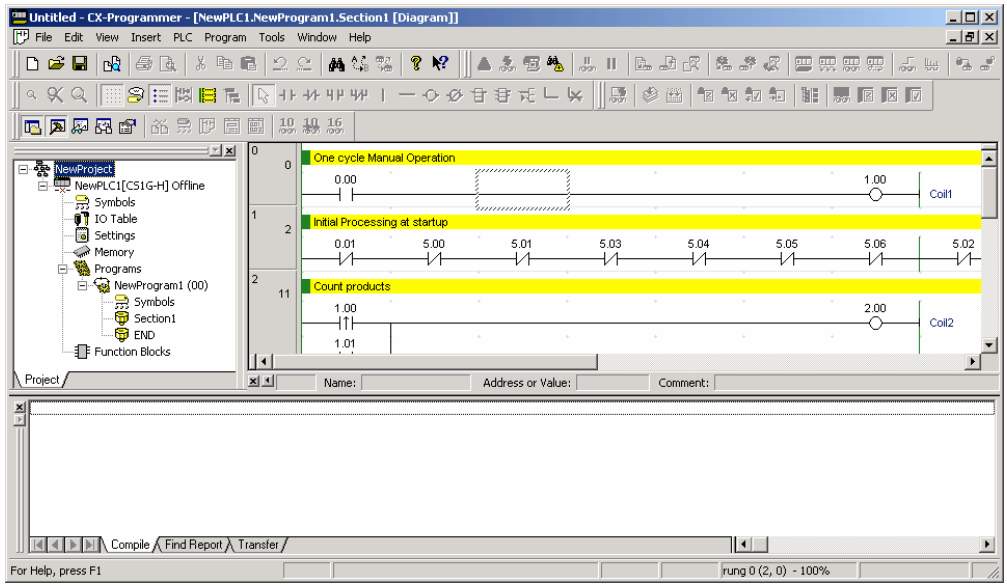


Double-click a section that you want to check its ladder.



4-3. Deletion and Display of Unnecessary Windows

Normal screen

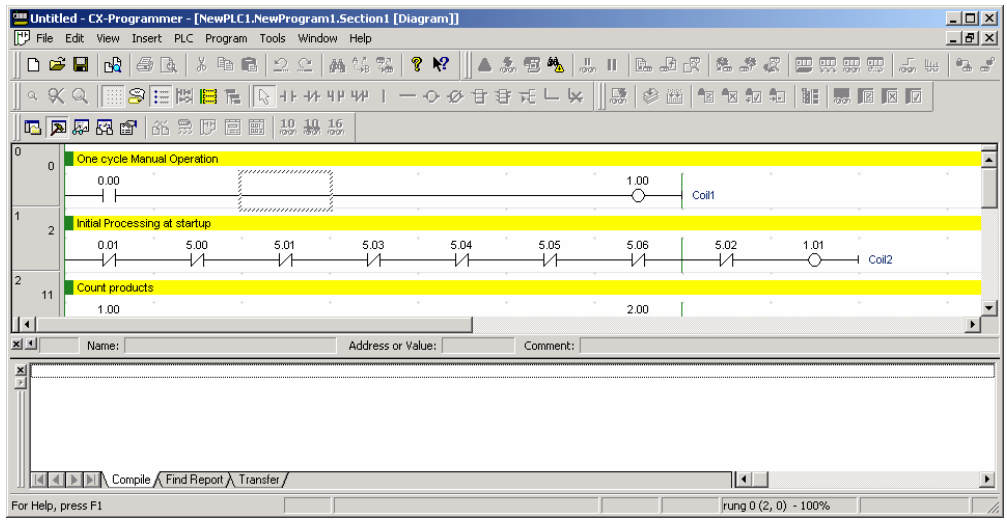


To delete Project Workspace,

Press from a keyboard

Alt + **1**

Press [Alt]+[1] to show Project Workspace again.



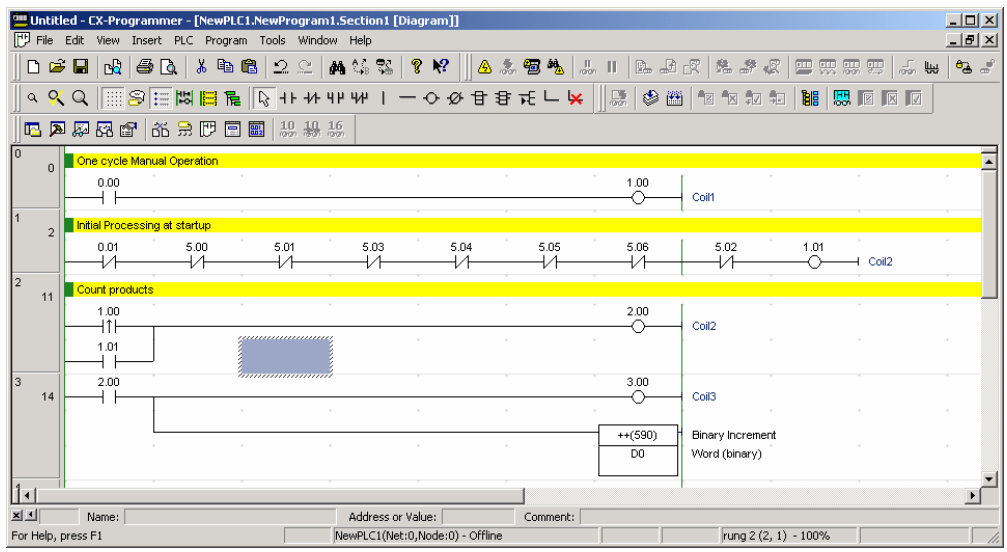
To delete Output Window,

Press from a keyboard

[ESC] or

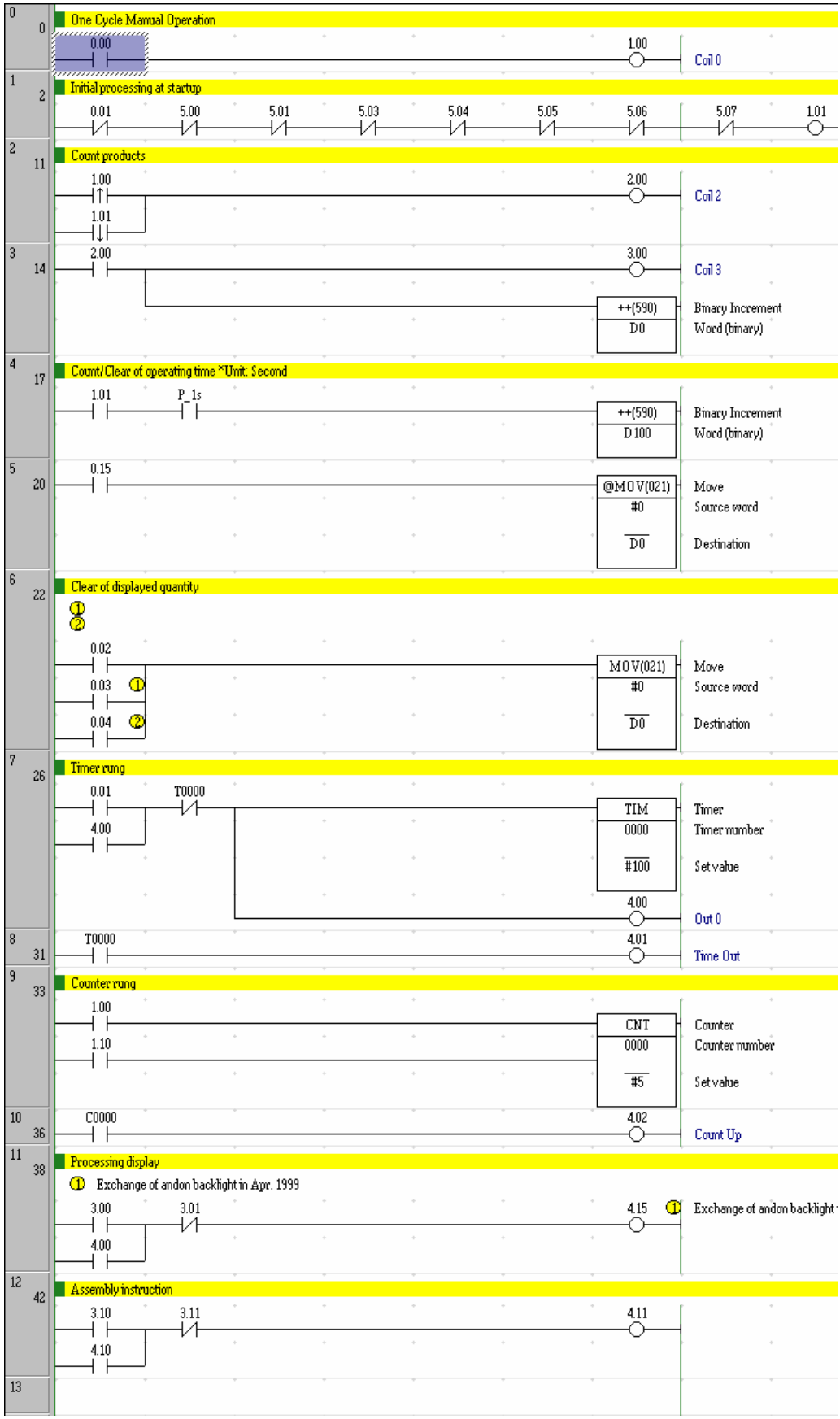
Alt + **2**

Press [Alt]+[2] to show Output Window again.

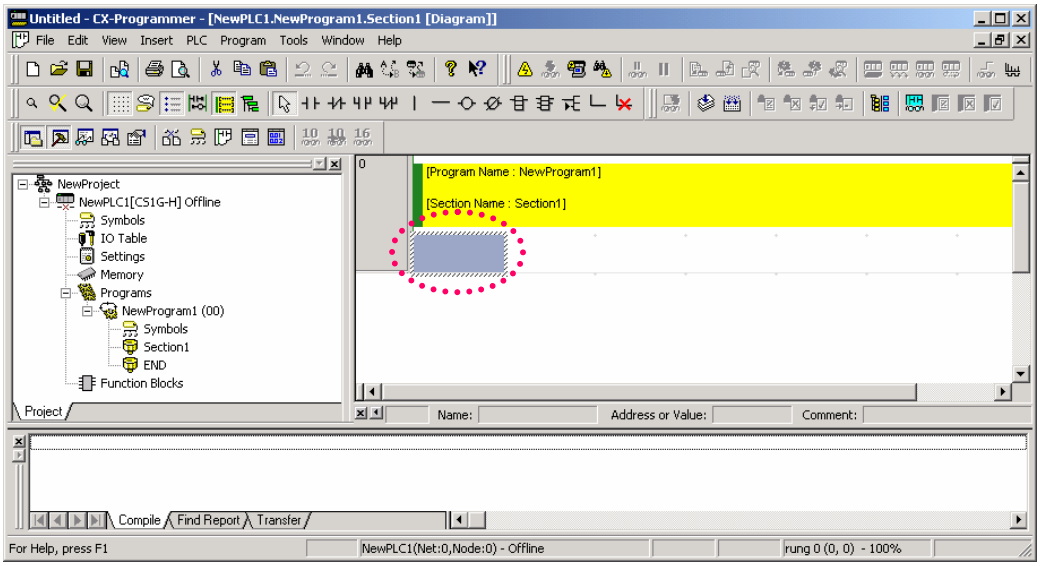


5. Program Creation

Coding of a simple program is explained here.



After checking the cursor position at the upper left of Ladder Window, start programming.

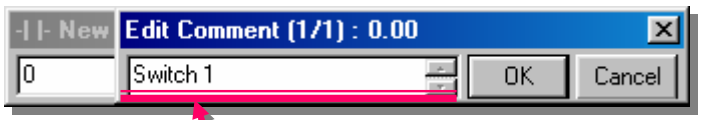


5-1. Entry of Normally Open Contact

C ····· Press [C] from a keyboard to open the [New Contact] dialog.

0 ····· 0 of the upper digit of an address can be omitted.

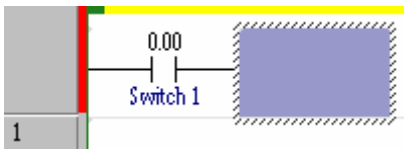
ENT



Switch 1

Enter a symbol comment.

ENT



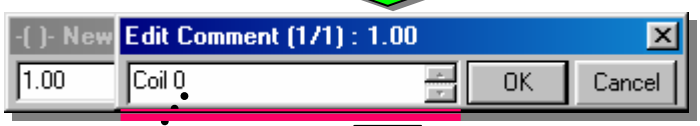
Deletion of instructions
- Move the cursor to the instruction and then press the DEL key.
- Move the cursor to the right cell of the instruction and press the BS key.

0 of the upper digit of an address is omitted when shown.
[.] (period) is displayed between a channel number and a relay number.

5-2. Entry of Coil

O ····· Press [O] from a keyboard to open the [New Coil] dialog.

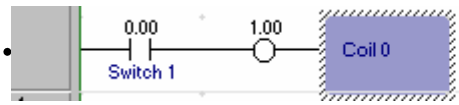
100 ·····



ENT

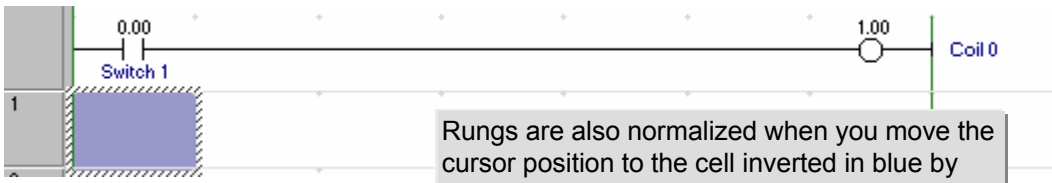
Coil 0 ·····

ENT ·····



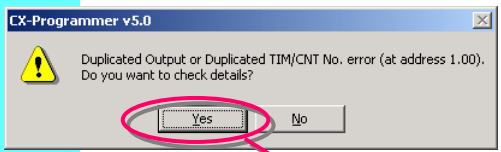
Press [R] to normalize a rung.

R ·····

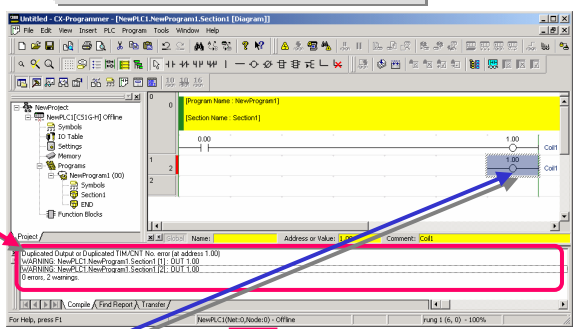


Rungs are also normalized when you move the cursor position to the cell inverted in blue by pressing the arrow keys from a keyboard or using a mouse.

Useful Function: Automatic check of duplicated coils
If a duplicated coil is entered during program creation, the following message is displayed and you can notice that the coil is duplicated right away.

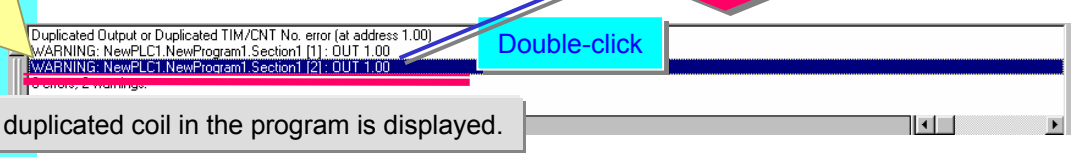


Press the [ESC] key to close the open Output Window.



Output Window automatically opens.

Double-click by using a mouse (or press F4). The cursor moves to the place of the applicable coil on Ladder Window.



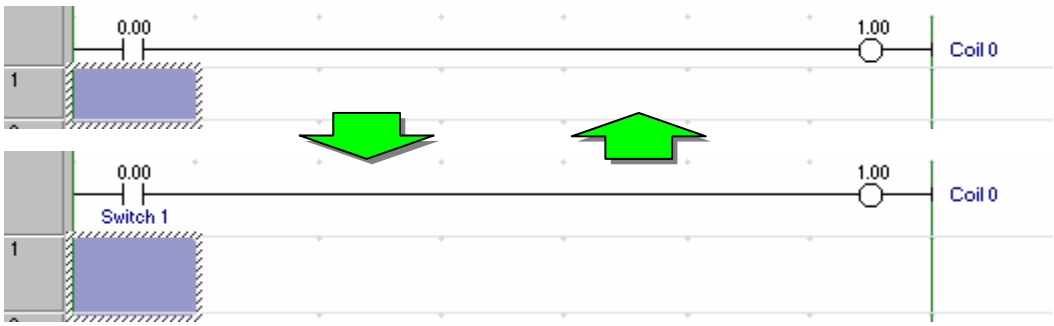
Double-click

The place of a duplicated coil in the program is displayed.

[Reference]

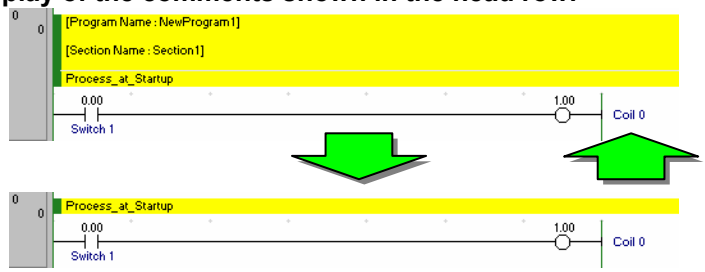
1. Press [Alt]+[Y]. You can switch showing/hiding of Symbol Comment.

Alt + Y



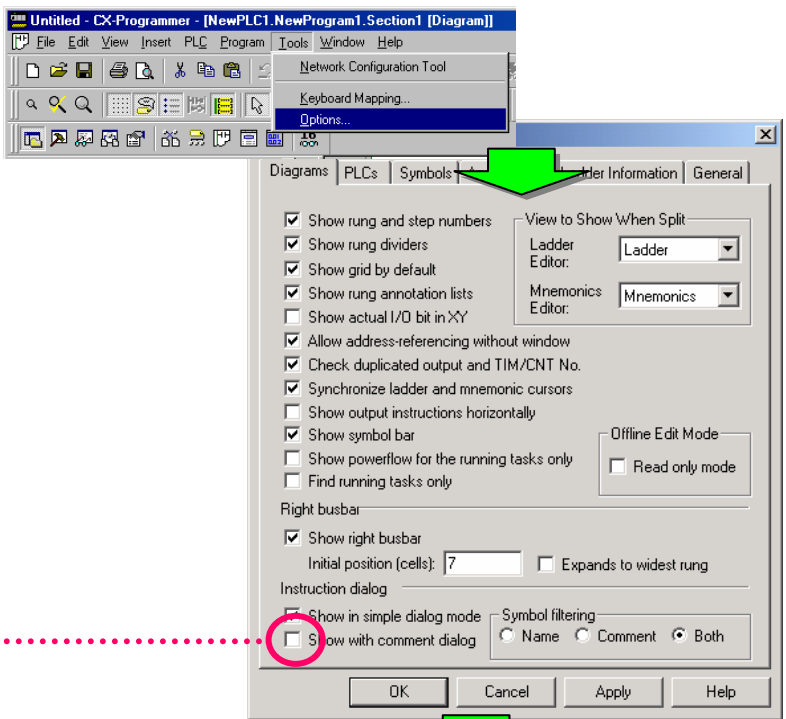
2. Click the toolbar button [Show Program/Section Comments] to switch the display of the comments shown in the head row.

Click 



3. Select [Tools] | [Options] from the CX-Programmer menu. You can set hiding of the comment entry dialog.

[Tools] -> [Options]

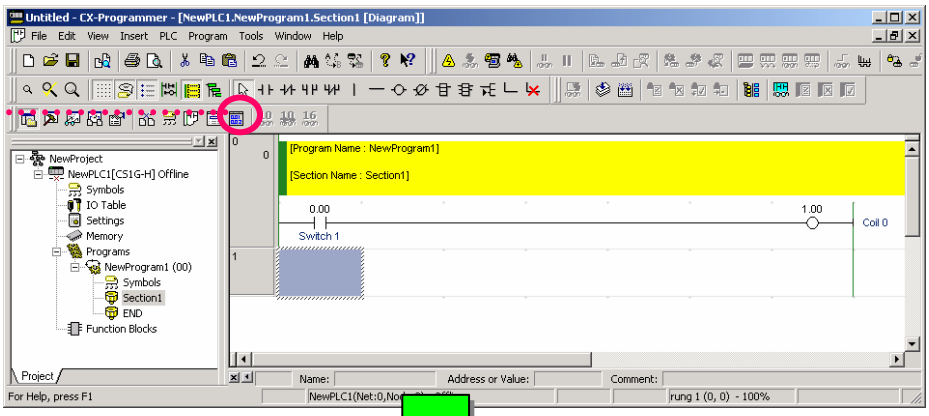


Click the check box to remove the check mark.

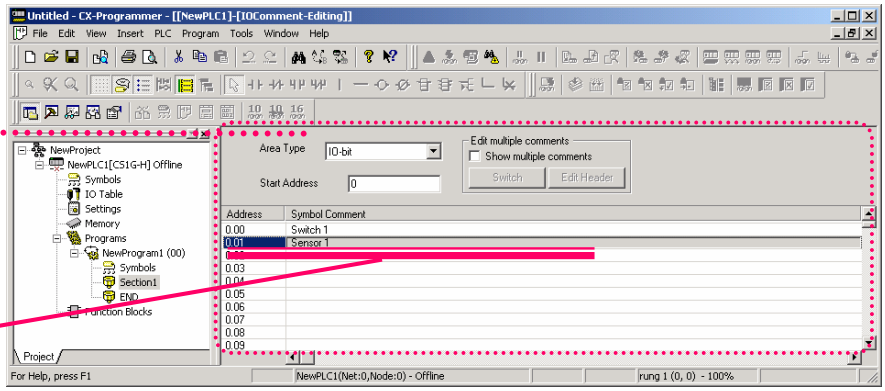
The comment entry dialog is not displayed anymore.

5-3. Edit of Symbol Comment

Click 



Ladder Window is switched to the Symbol Comment Editing window.



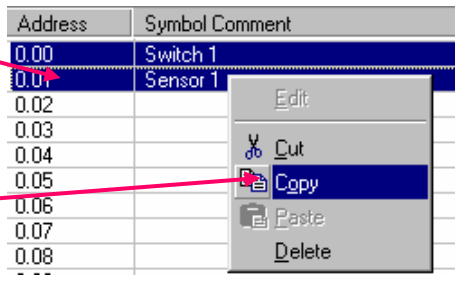
Double-click the left mouse button on a bit number that you want to enter a symbol comment, and you will able to enter a symbol comment.

Copy&Paste and deletion of one or more comments are possible by the cell.

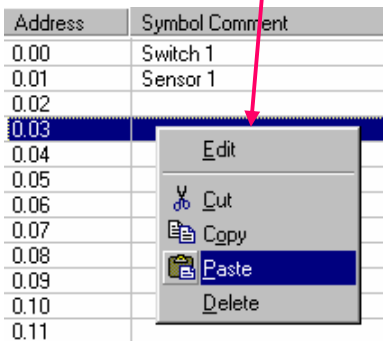
Example of copying & pasting comments of two bits

Drag the mouse with the right mouse button pressed to invert the source bits of copy in blue.

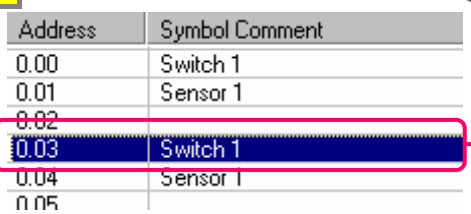
Click the right mouse button on the range, and select [Copy] from the popup menu.



Click the right mouse button on the bit number of the copy destination, and select [Paste].



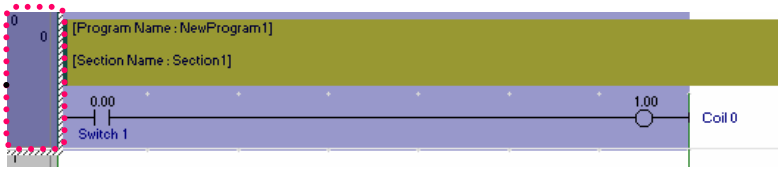
Copy&Paste of symbol comments is possible between Excel and CX-Programmer too.



The comments of the selected two bits are copied.

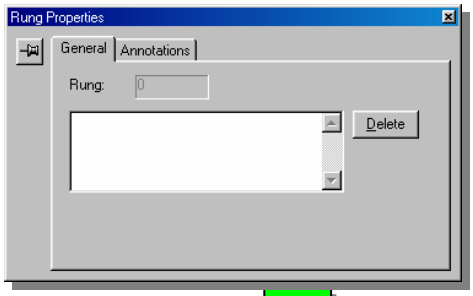
5-4. Entry of Rung Comment

Move the cursor to this position. (The rung is inverted in blue.)

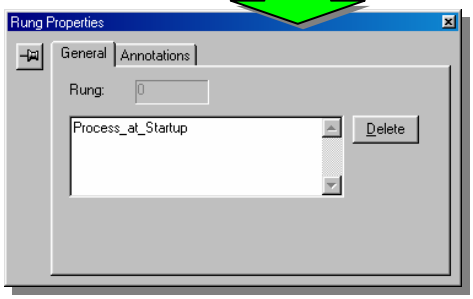


ENT

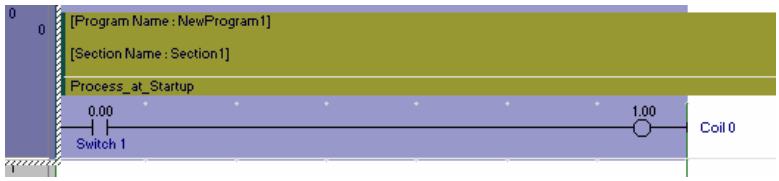
The entry screen shows up.



[Process_at_Startup]
Enter a rung comment.



ENT



5-5. Entry of Normally Closed Contact

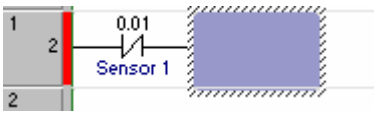
/ ..... Press "/" from a keyboard to show the [New Closed Contact] dialog.

1

ENT

Sensor 1

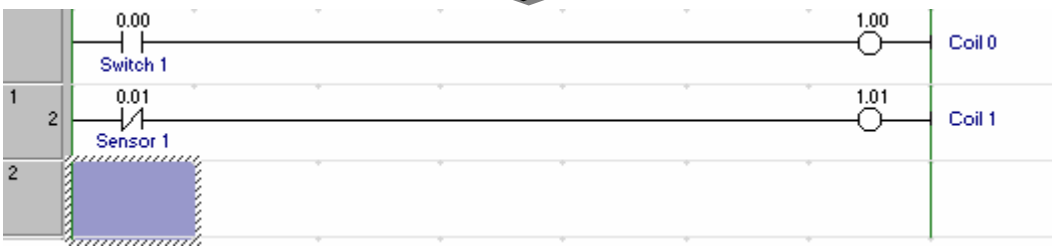
ENT



O > 101 >

ENT > Coil 1

ENT > R



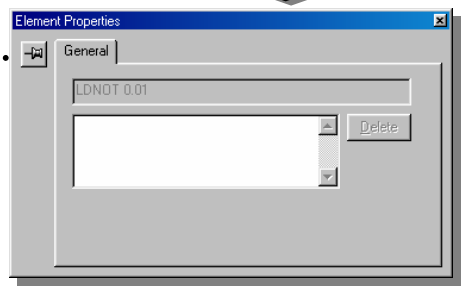
5-6. Entry of Attached Comments

This function is very useful for keeping change histories at maintenance and notes of debug bits at startup.

Move the cursor to the contact to which you want to write an annotation.

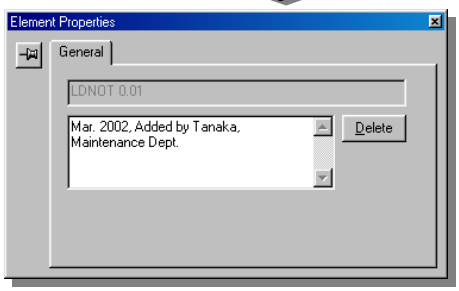
Alt + ENT

The entry screen shows up.



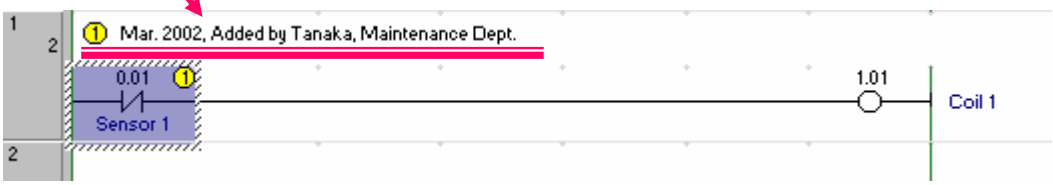
Or click the right mouse button.
-> [Properties]

Enter [Mar. 2002 Added by Tanaka, Maintenance Dept.].



ENT

Press [Alt] + [A] to switch showing/hiding of attached comments.



5-7. Entry of Differential Contact…Up

C

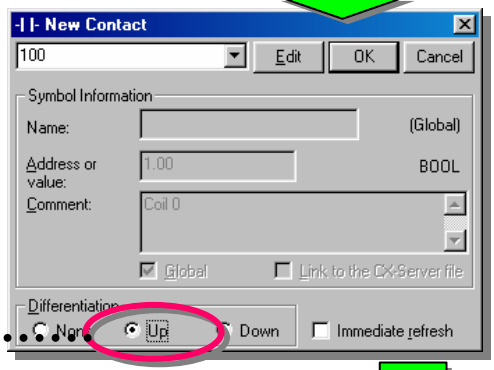
100

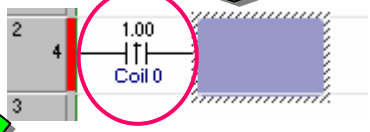
Click Detail >>

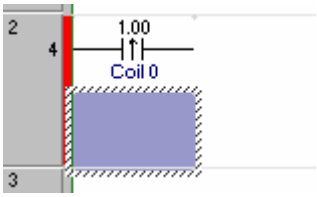
Click [Up].

ENT

ENT







This entry method is available only for CS/CJ and CV series PLCs.
For the other series PLCs, use DIFU (13).

5-8. Entry of Differential Contact…Down

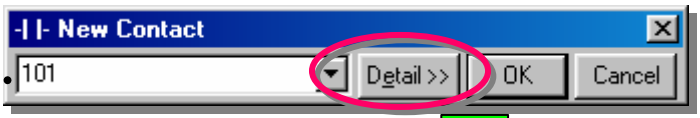
C

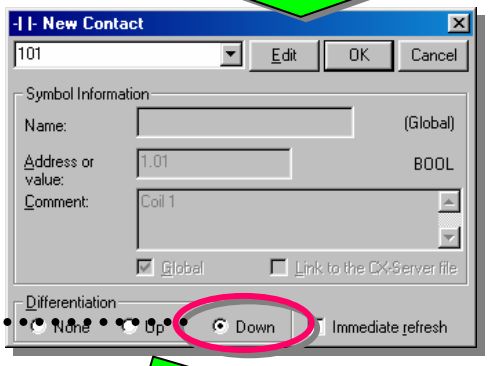
101

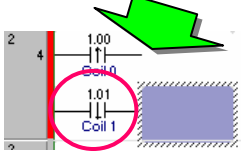
Click Detail >>

Click [Down].

ENT







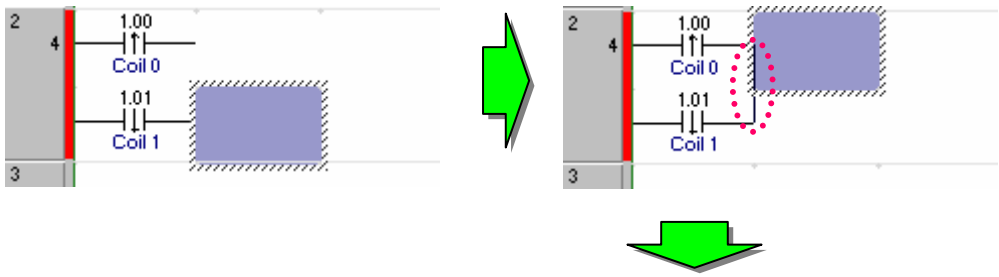
This entry method is available only for CS/CJ and CV series PLCs.
For the other series PLCs, use DIFD (14).

5-9. Entry of Vertical…Up

Ctrl + ↑

Or

U



O 200 ENT Coil 2

ENT R

C 200 ENT ENT

O 300 ENT Coil 3 ENT

5-10. Entry of Vertical…Down

←

Ctrl + ↓

Or

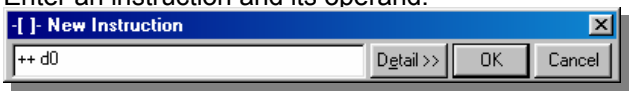
V

5-11. Entry of Advanced Instructions 1 - Entry of Strings

I ..... Show the [New Instruction] dialog.

Enter an instruction and its operand.

++␣d0 ENT



Enter a comment.

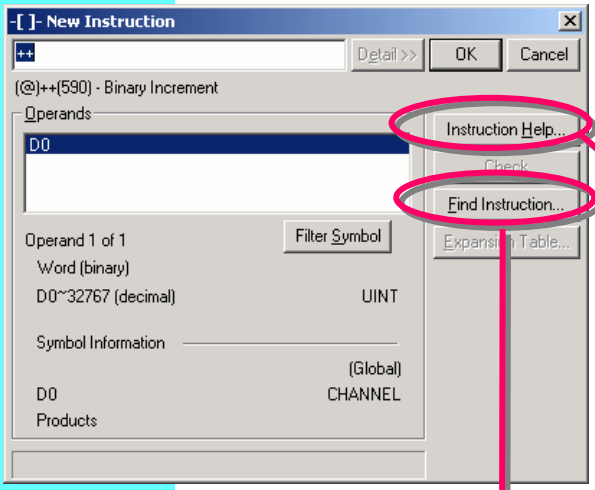
Products ENT

See the next page for the contents of instructions.

R

5-12. Entry of Advanced Instructions 1 - Useful Functions

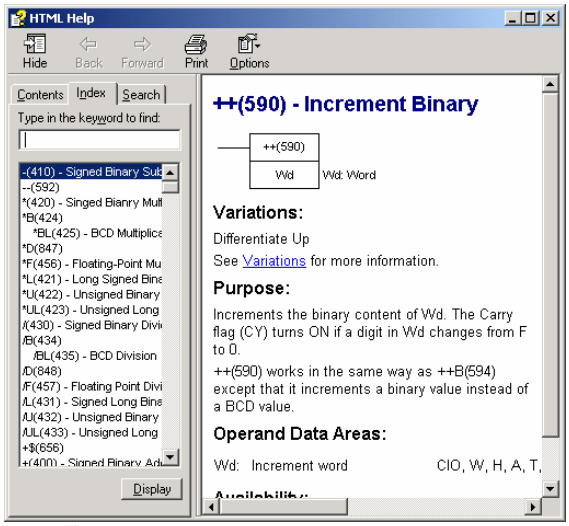
Click Detail >>



Instruction Help Function

Click Instruction Help...

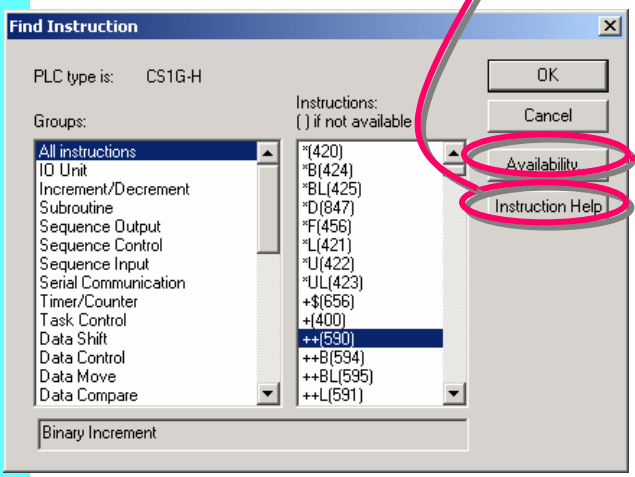
The reference guide screen of the instruction shows up.

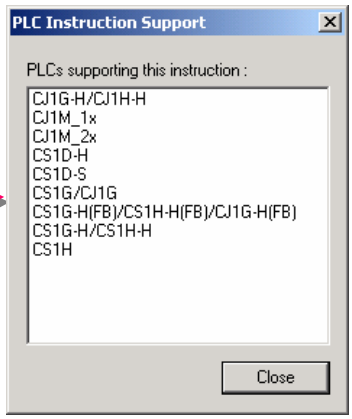


Find Instruction Function

Click Find Instruction... .

The list of advanced instructions per function shows up.





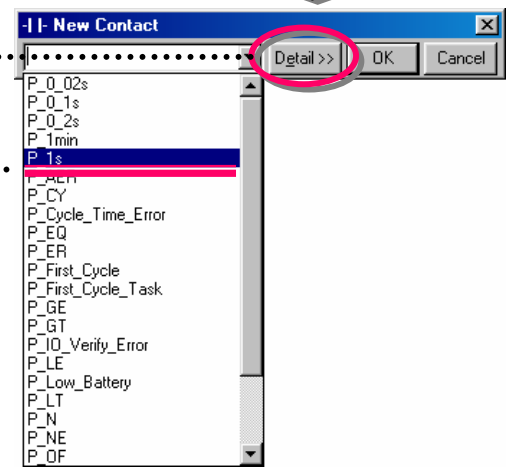
PLCs supporting the applicable instruction are listed.

5-13. Entry of Auxiliary Relay - 1.0 Second Clock Pulse Bit

Show the [New Contact] dialog.

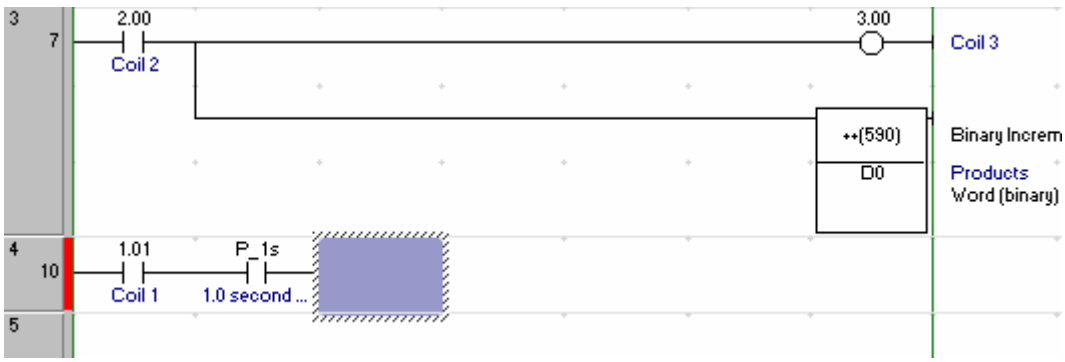
C

Click



Select [P_1s] from the pull-down menu.

ENT



Refer to the former pages to execute coding.

5-14. Entry of Advanced Instructions 2 - Entry of Differential Instructions

Differential Instructions…Instructions executed in only one scan when running a program.

Show the [New Instruction] dialog.

I

Enter
@MOV␣#0
␣D100

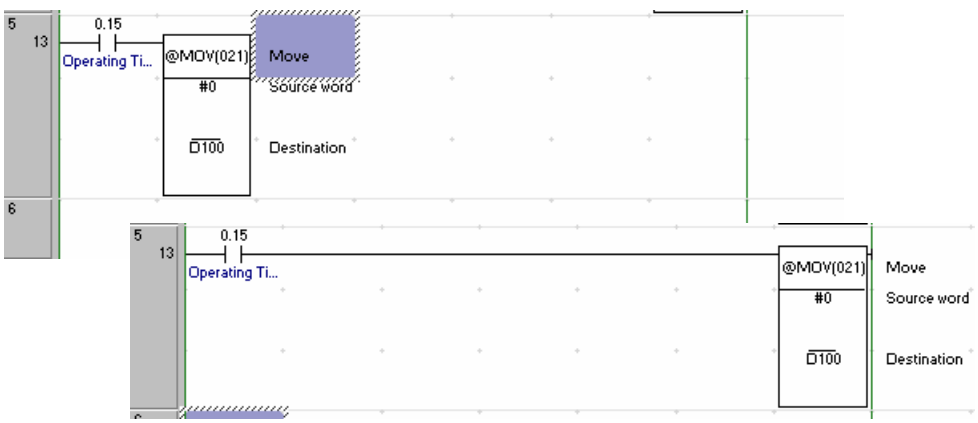
Attach @ (at mark) before instructions. It makes the instructions differential.

Enter a comment if necessary.

ENT

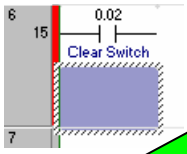
ENT

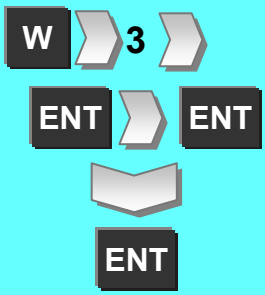
R

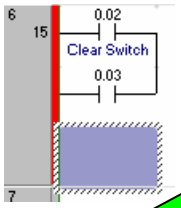


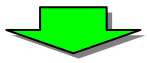
Refer to the former pages to execute coding.

5-15. Entry of OR Rung

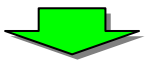


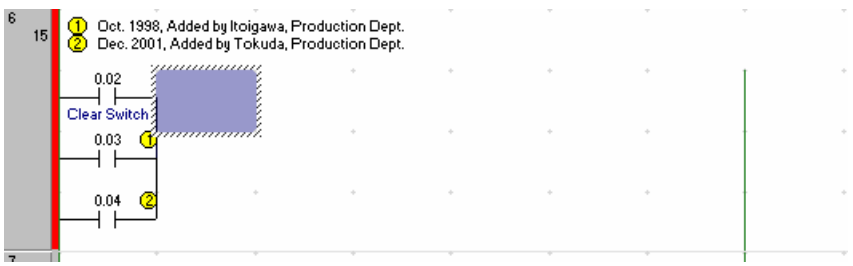


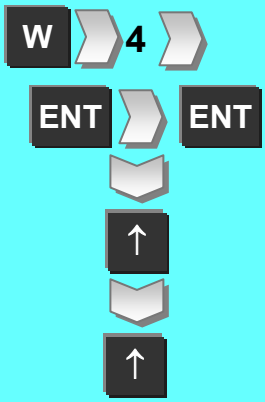




Entry of comments is omitted here.





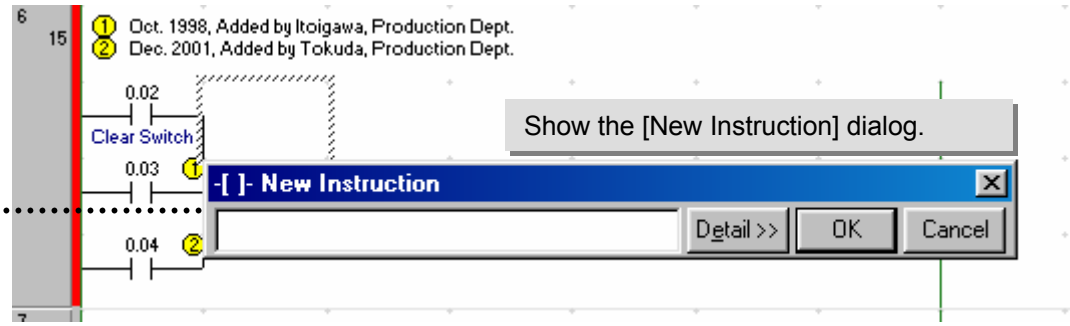


Refer to the section 5-6 to enter annotations.

5-16. Entry of Advanced Instructions 3 - Entry by Fun No.

I

Show the [New Instruction] dialog.

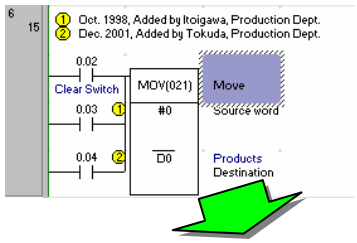


021

The instruction corresponding to the entered Fun No. is displayed.

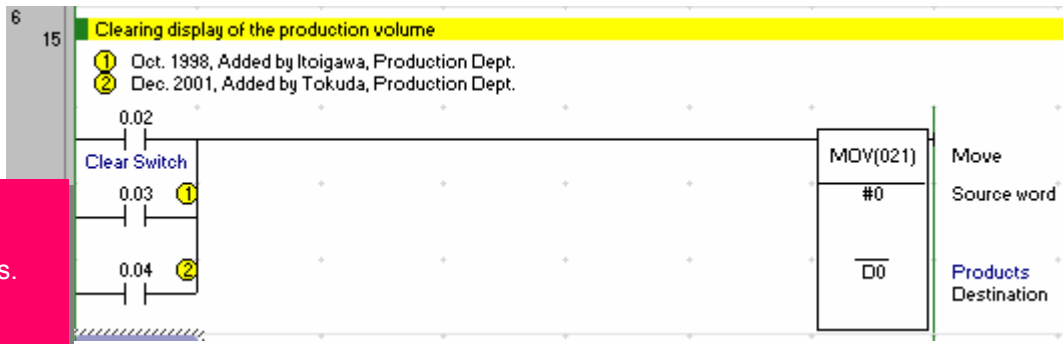
Enter **#0 D0** ENT

ENT



Refer to the section 5-4 to enter a rung comment.

R



Note:
The Fun No. of MOV depends on PLC types.
- CS-series -> 021
- CJ-series -> 021
- CV-series -> 030
- C-series -> 21

Refer to the former pages to enter rungs and comments.

5-17. Entry of Timer Instructions

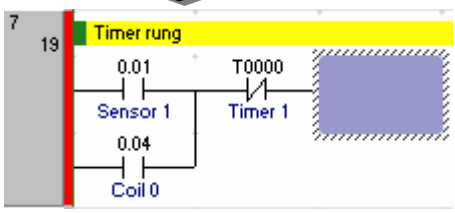
Entry of a Timer bit

/ T0 ENT

*T0: Indicates TIM0.

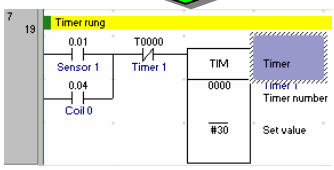
Enter a comment.

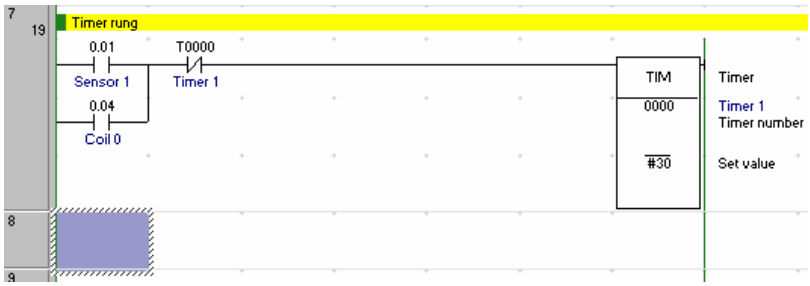
Timer 1 ENT



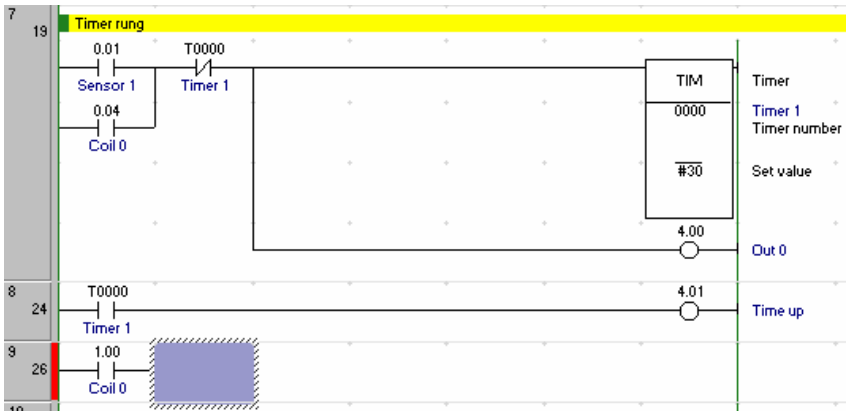
Entry of a Timer instruction

I TIM␣0␣#30 ENT R





Refer to the former pages to execute coding.

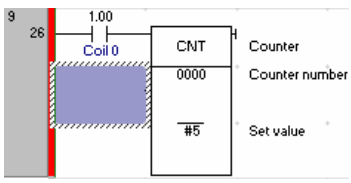


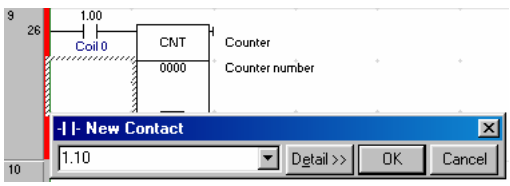
5-18. Entry of Counter Instructions

Entry of a Counter instruction

I

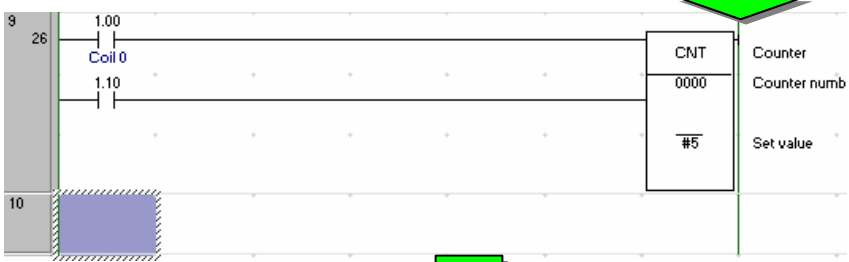
CNT␣0␣#5





ENT

Move the cursor by using arrow keys or a mouse.
Enter a bit for reset.



R

C **C0** **ENT**

ENT

Entry of a Counter bit

O **402** **ENT**

ENT

R

5-19. Edit of Rungs …Copy & Paste

Move the cursor to this position. The rung is inverted as shown right.

Ctrl + C

(Copy a rung)

↓

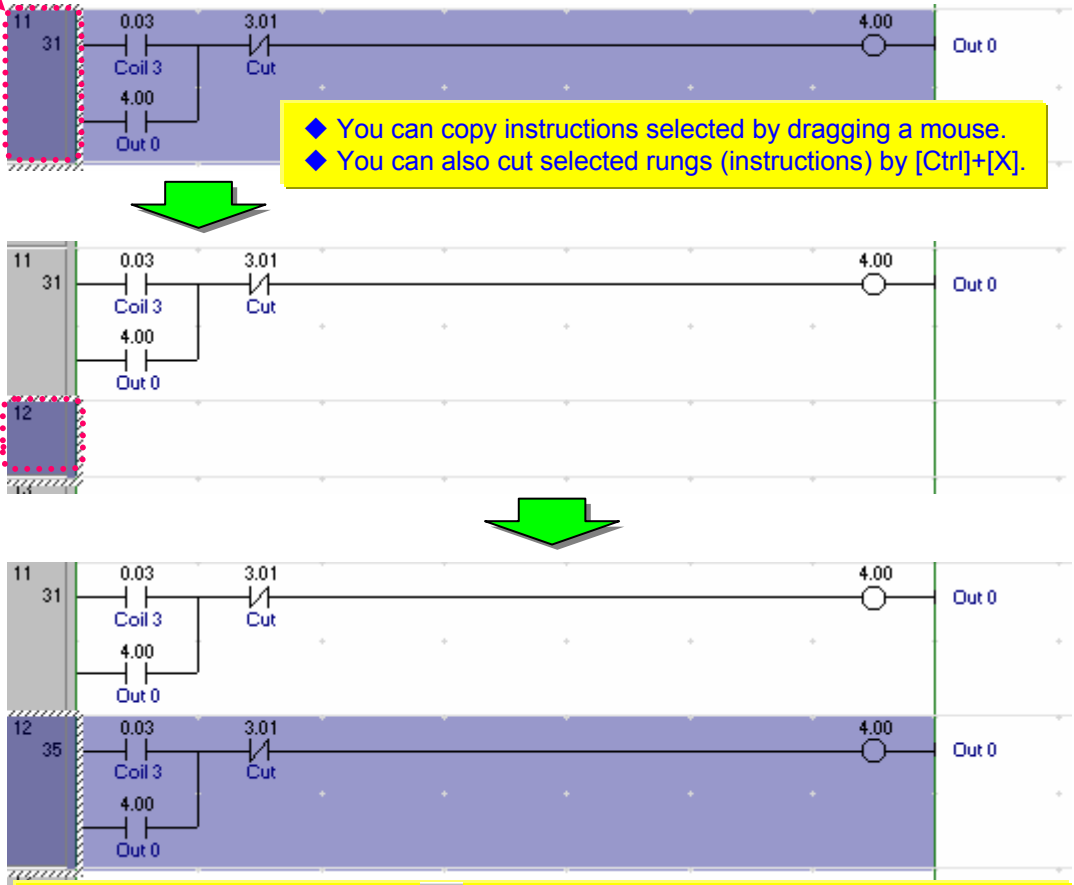
Press the ↓ key to move the cursor to this position.

Ctrl + V

(Paste a copied rung)

Click each instruction and then change the bit numbers.

Refer to the former sections to enter a rung.

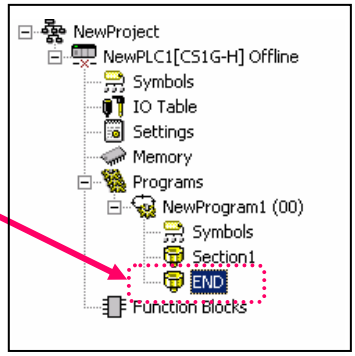


◆ You can copy instructions selected by dragging a mouse.
◆ You can also cut selected rungs (instructions) by [Ctrl]+[X].

◆ When making a mistake, press or [Ctrl+Z] for Undo (return to the previous operation)
press or [Ctrl+Y] for Redo (go to the next operation)

5-20. Entry of END Instruction

At the creation of a new project, a section of the END instruction only is automatically generated.
You do not need to enter an END instruction.



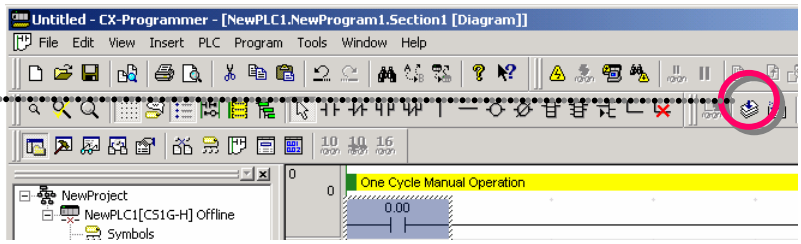
Note:
The END section is not generated when you load a program created with CX-Programmer V2 or the former versions.

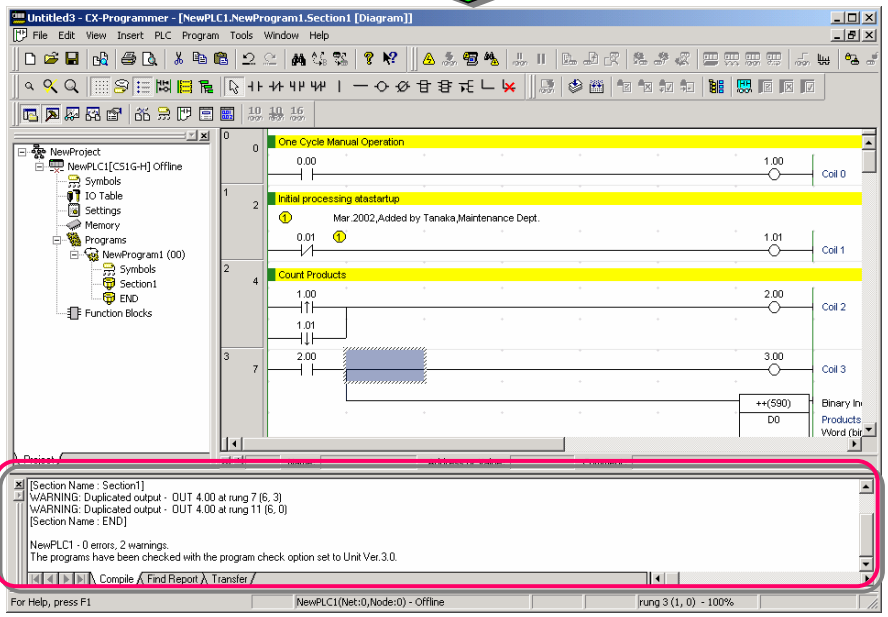
Chapter 2
Online / Debug

1. Program Error Check (Compile)

Before program transfer, check errors.

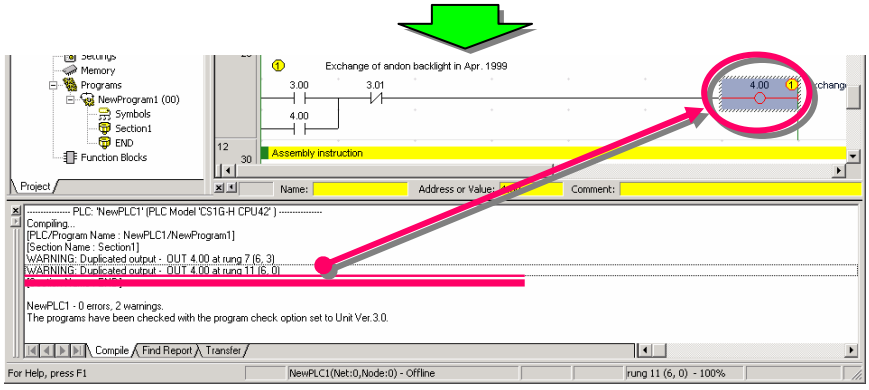
Click 





Errors and addresses are displayed on Output Window.

Double-click a displayed error, and the cursor in Ladder Diagram will go to the corresponding error location and the error rung will be shown in red.



Modify the error.

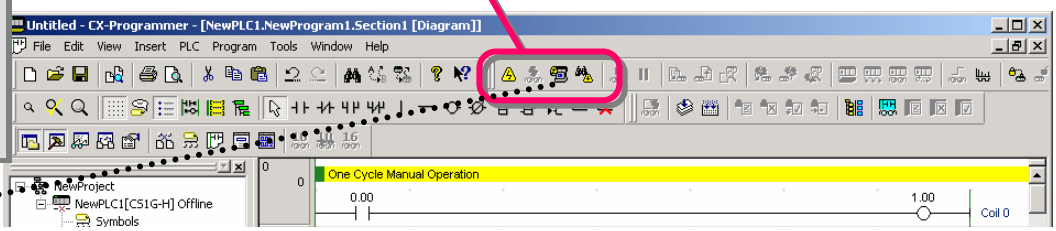
- Output Window automatically opens at program check.
- The cursor moves to an error location by pressing J or F4 key.
- Output Window closes by pressing the ESC key.

2. Going Online

CX-Programmer provides three kinds of connecting methods depending on usage.

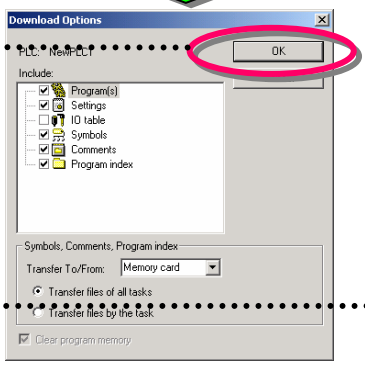
- Normal online. Enables you to go online with a PLC of the device type and method specified when opening a project.
- Auto online. Automatically recognizes the connected PLC and enables you to go online with a PLC with one button.
  -> Uploads all data such as programs from the PLC.
- Online with Simulator. Enables you to go online with CX-Simulator with one button (You need to install CX-Simulator.)

This time, online/debug functions when working online with CX-Simulator are explained in this guide (Install CX-Simulator separately).

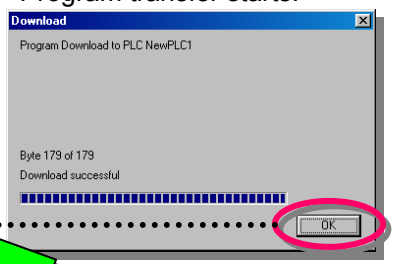


Click

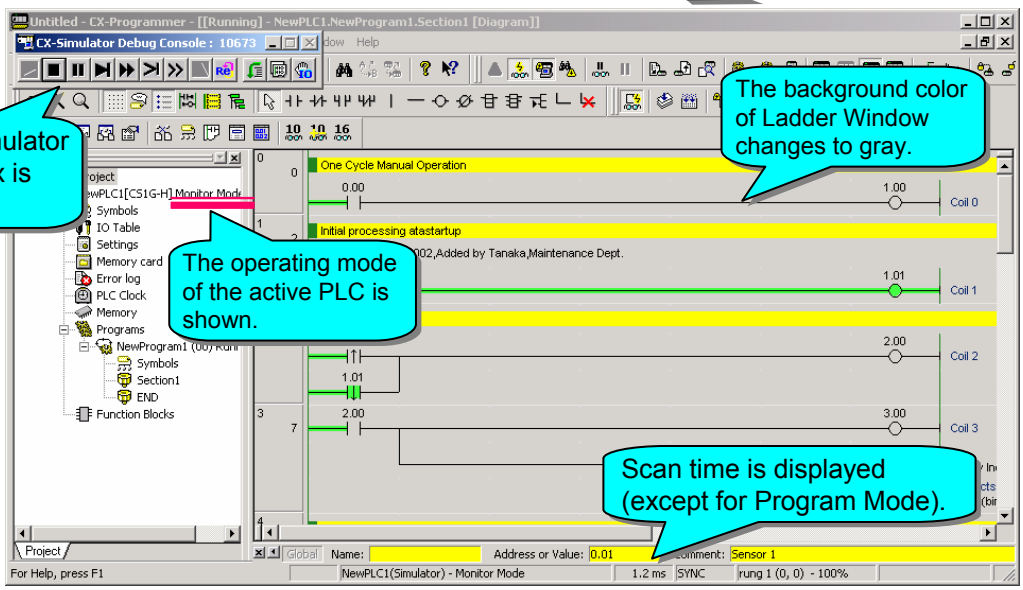
Click [OK].



Program transfer starts.



Click [OK].

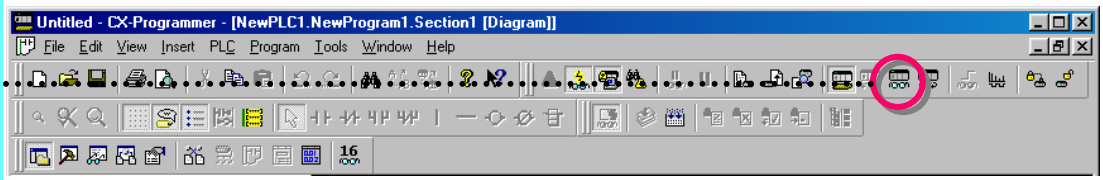


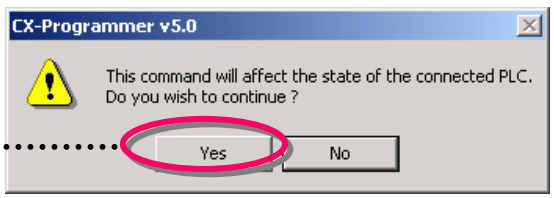
3. Monitoring

Change the PLC (simulator) to Monitor Mode.

The on/off statuses of contacts and coils are monitored.

Click 

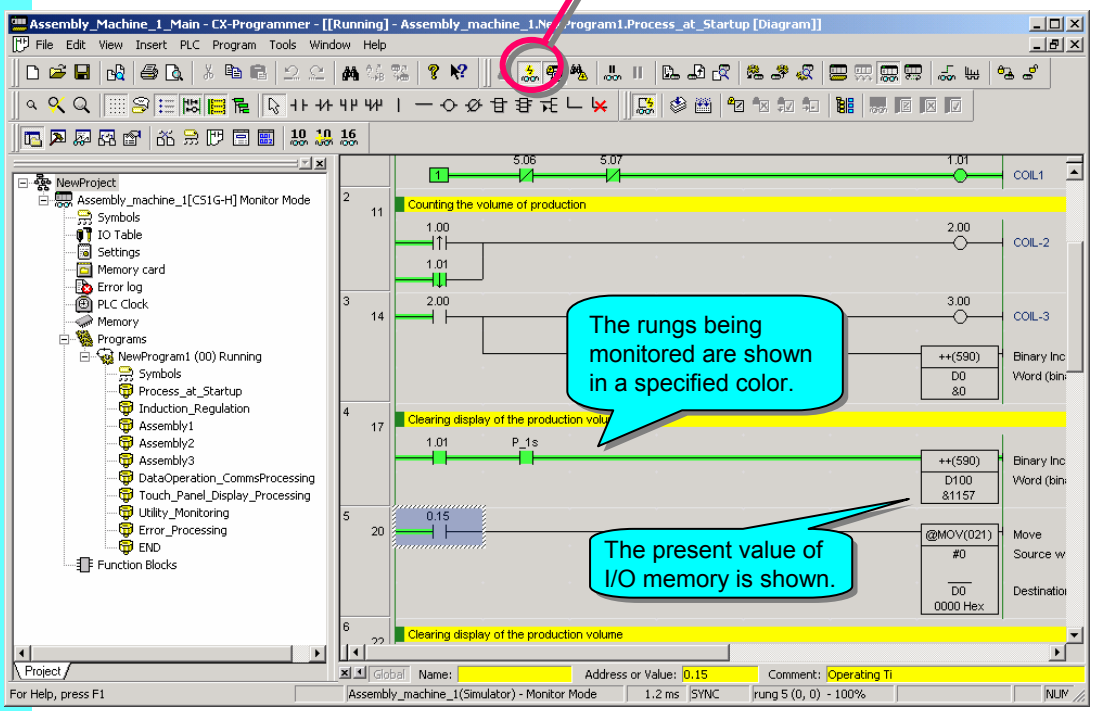




Click [Yes].

If your program has a large volume of data, the scroll speed of the screen may become slow when monitoring. In that case, click the below icon to cancel monitoring once, scroll the screen to the address you want to monitor, and then change to monitoring mode again.

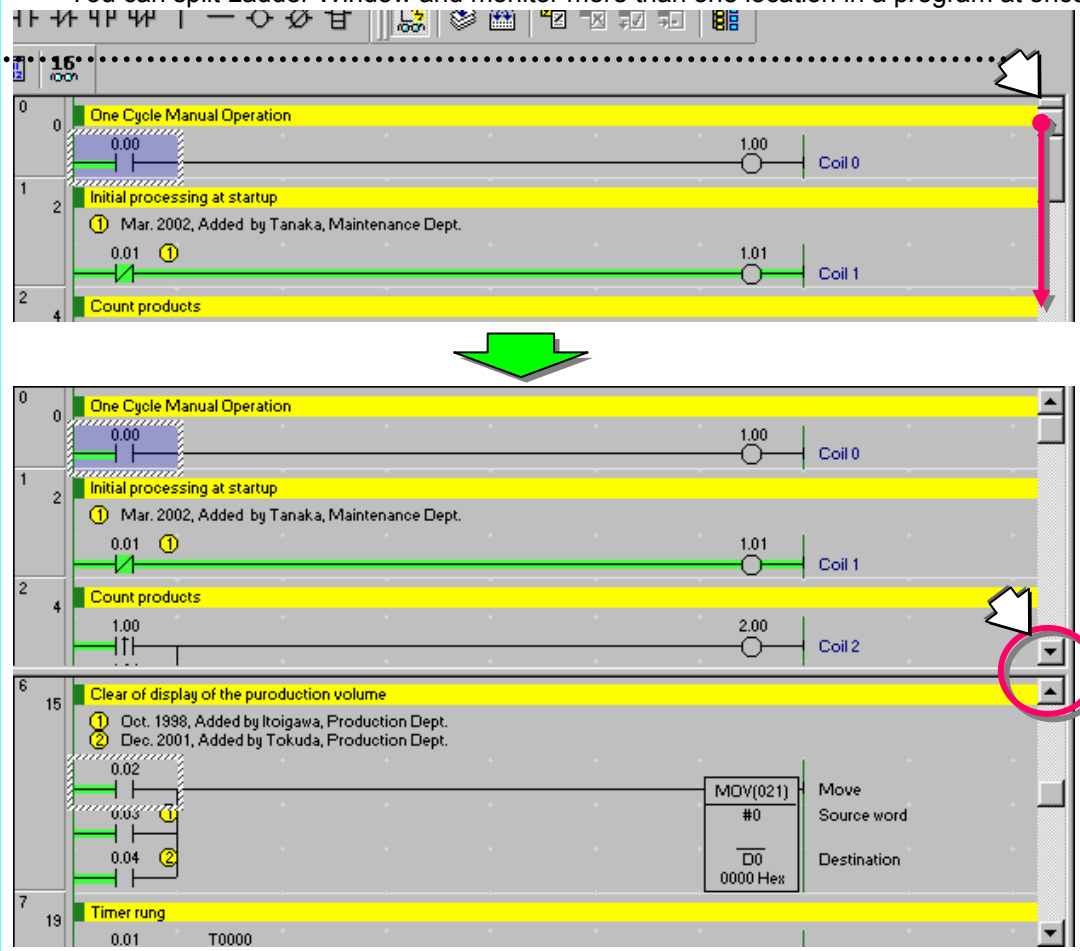
 toggles on/off of PLC monitoring.



4. Monitoring - 2 Monitoring Many Locations in Program at Once

You can split Ladder Window and monitor more than one location in a program at once.

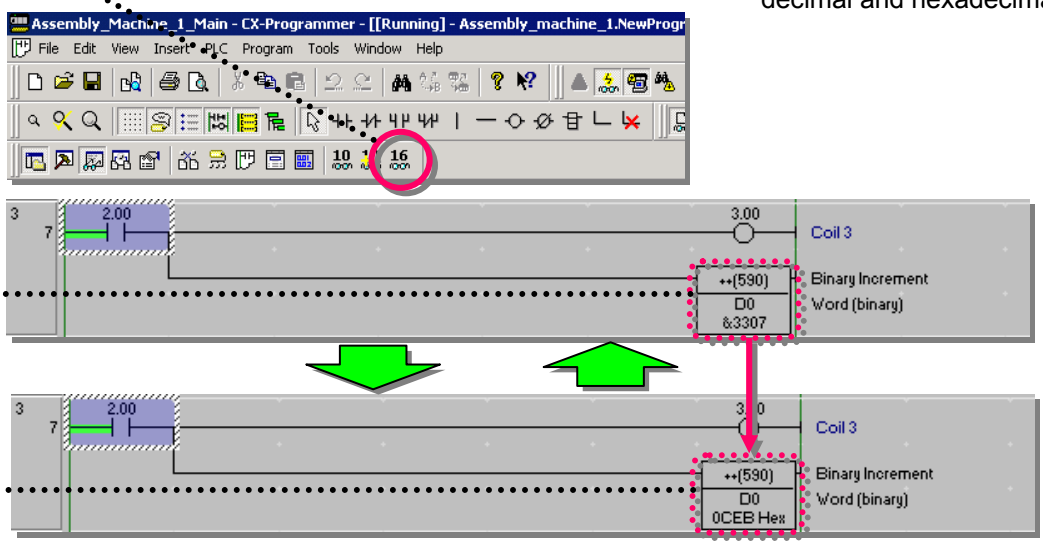
Move the mouse pointer to the arrow position shown in the right figure and drag the cursor down with the left mouse button pressed.



The screen is divided into two panes up and down, and you can display any address in two panes respectively by using the scroll bars.

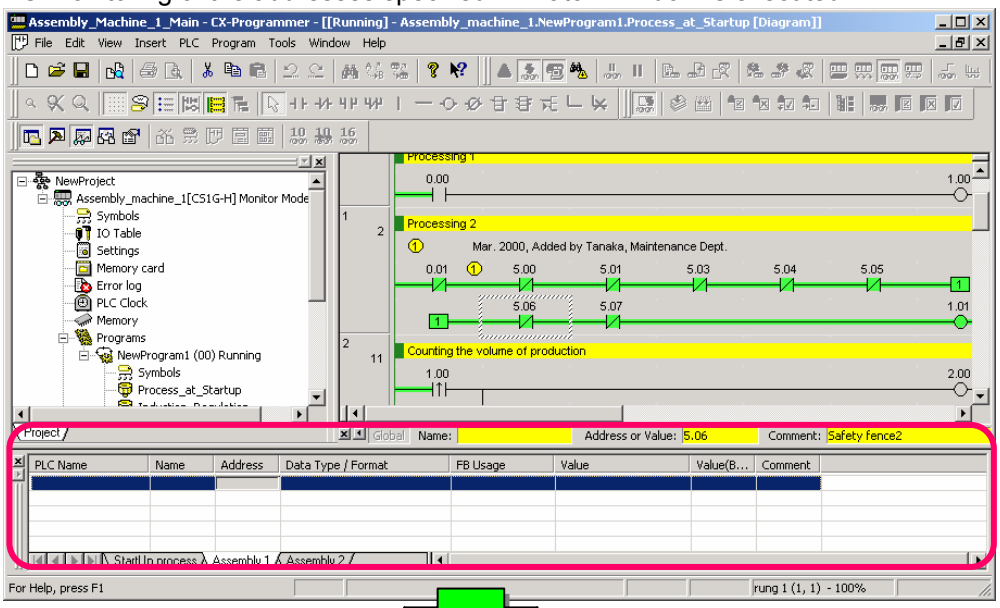
5. Monitoring - 3 Monitoring in Hex

Click 16 to switch the display format of the present value of IO memory between decimal and hexadecimal.



6. Monitoring - 4 Watch Window

I/O monitoring of the addresses specified in Watch Window is executed.

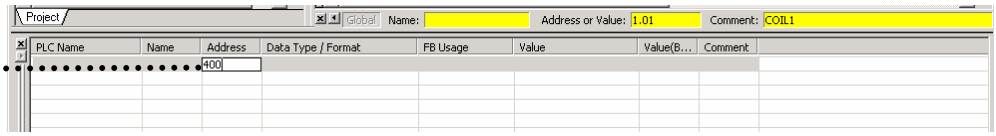


Display Watch Window.

Alt + 3

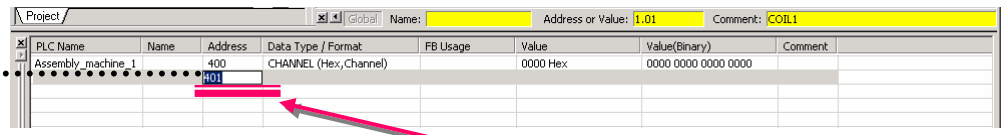
Enter a bit number that you want to monitor.

400



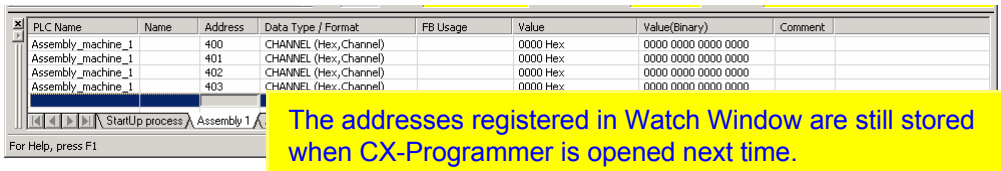
ENT

Press the ENT key continuously for auto increment of addresses.



You can also enter a given address in this status.

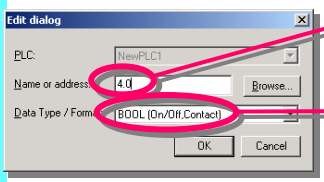
ENT ENT ENT



The addresses registered in Watch Window are still stored when CX-Programmer is opened next time.

Entry of BOOL type (contact)

Example: Entry of 4CH 00Bit



Enter "." (period) between CH and Bit.

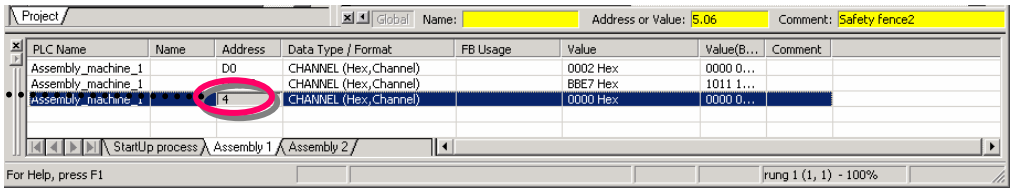
Or enter "400" without a period in the "Name or address" box and then specify "BOOL" in the "Data Type/Format" box (Reverse the box and then press B key form the keyboard.)

7. Monitoring - 5 Present Value Change and Binary Monitoring in Watch Window

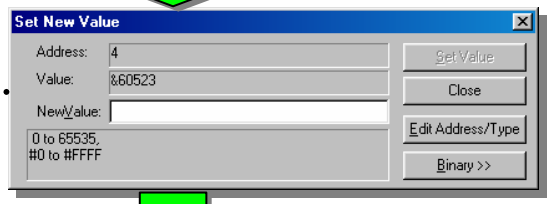
The present values of bits and words are changed in Watch Window.

In Watch Window, binary monitoring is possible for the data that can be treated by the word.

Double-click the mouse.

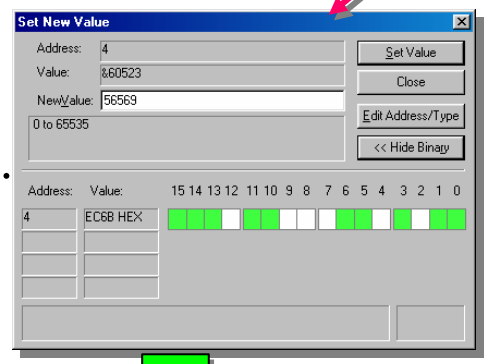


An entry dialog opens.

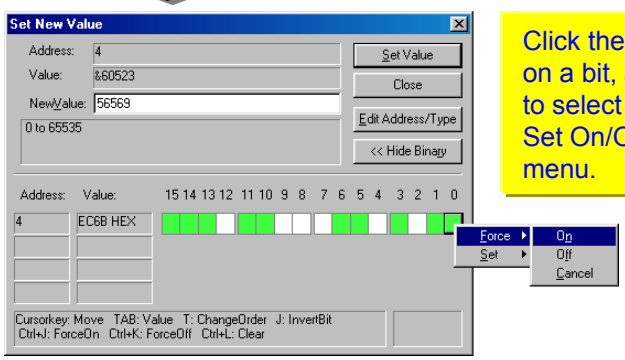


Enter a new value that you want to change to.

Click



4-word data is displayed in the binary system.



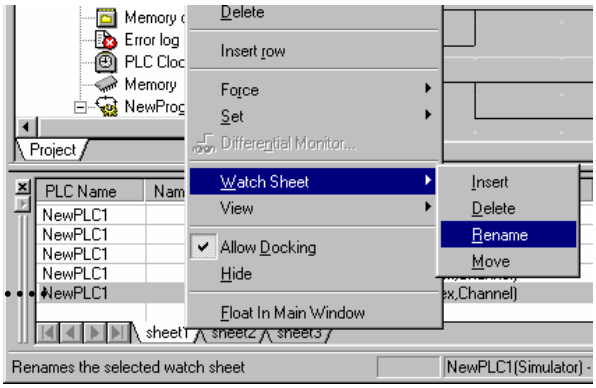
Click the right mouse button on a bit, and you will be able to select Force On/Off and Set On/Off from the popup menu.

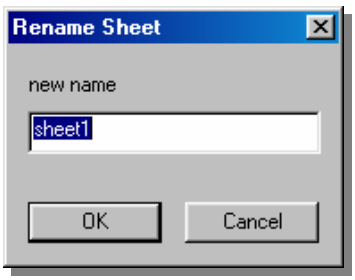
As shown in the guidance at the bottom of the dialog, Force On/Off and Set On/Off are enabled also by key operation.

8. Useful Functions of Watch Window

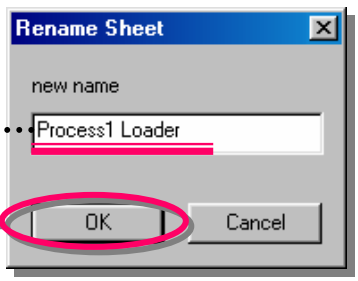
Watch Window has a function that classifies and displays data in sheets like MS-EXCEL and names each sheet given names.
This function is useful for debug or startup if you gather and manage the bits and words you want to check as one block in one sheet.

Click the right button of a mouse on Sheet1, and then select [Watch Sheet] -> [Rename].



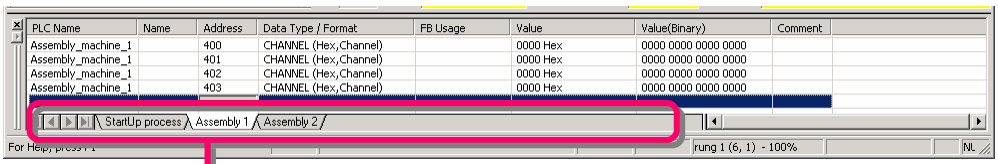


Enter a name.



Click [OK].

To add a sheet, select [Watch sheet] -> [Insert].



It is useful to manage data if you name sheets by the phase or assembly.

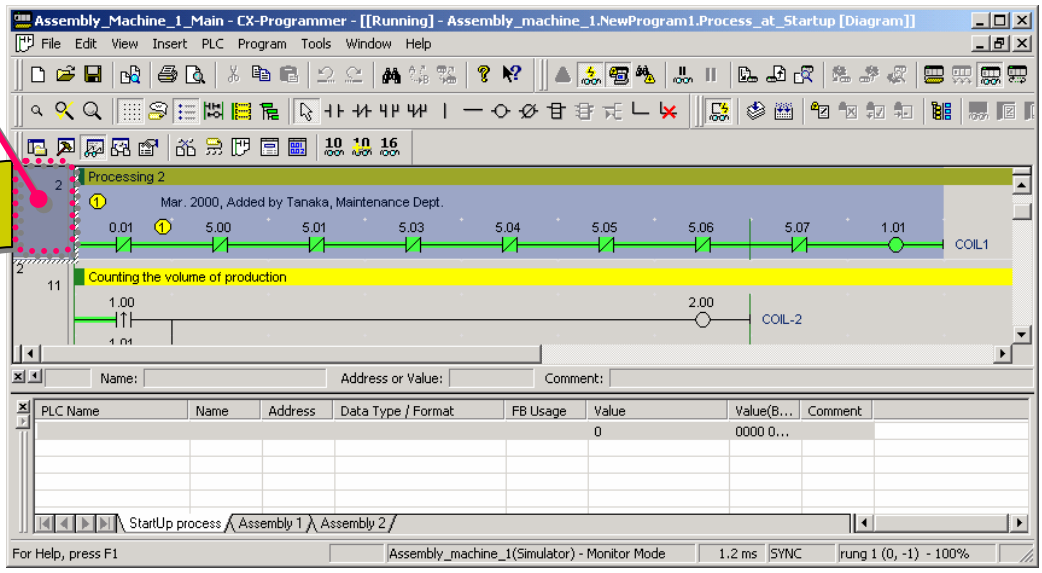
Right-click on Watch Window. -> Select [View] from the popup menu. And then you will be able to choose showing/hiding of each item on Watch Window.

The names set by this operation are all saved when the project is saved (extension: .opt). Therefore, they are loaded as well as data such as ladder programs when the project is loaded next time.

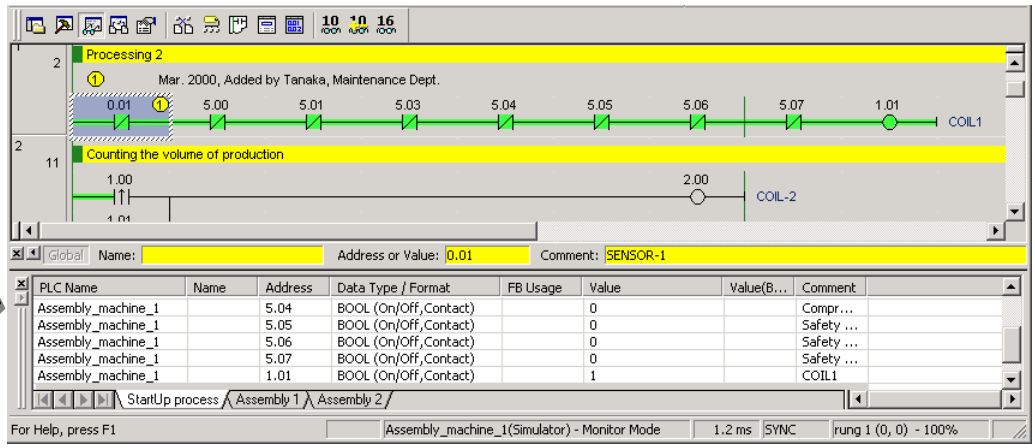
9. Monitoring - 6 Watch Window - 2

Drag & Drop from Ladder Diagram enables you to add an address to be monitored.

Move the mouse cursor to this position.



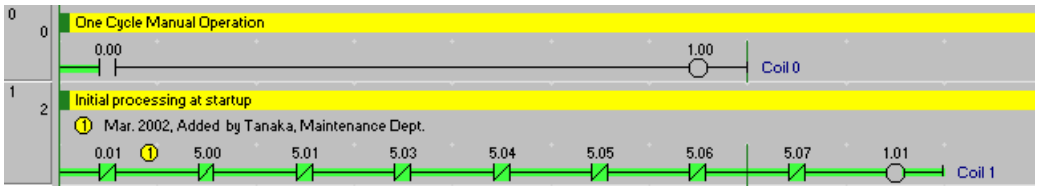
Drag and drop on Watch Window.



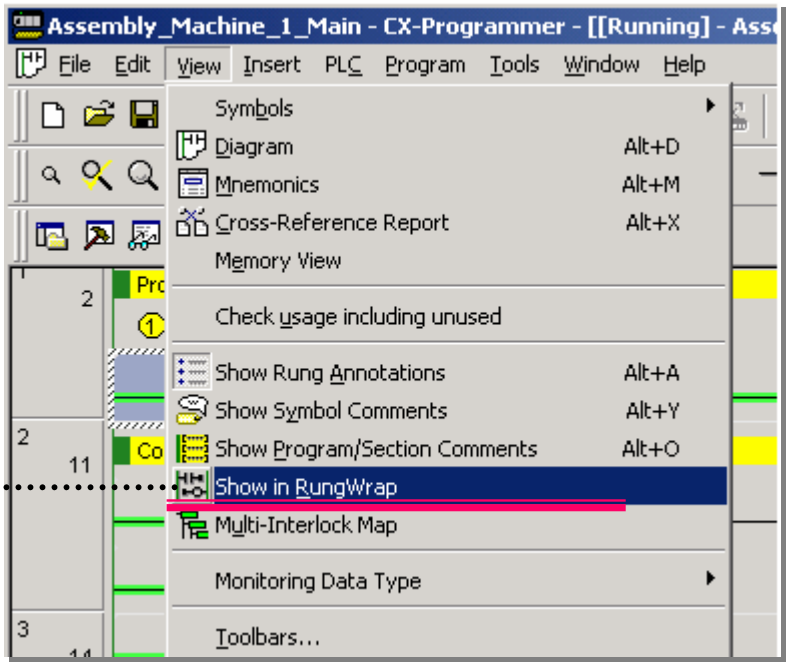
Data such as rungs, bits per block, or operands of advanced instructions is pasted on Watch Window.
Moreover, the on/off statuses of the bits and the present values of words are displayed.

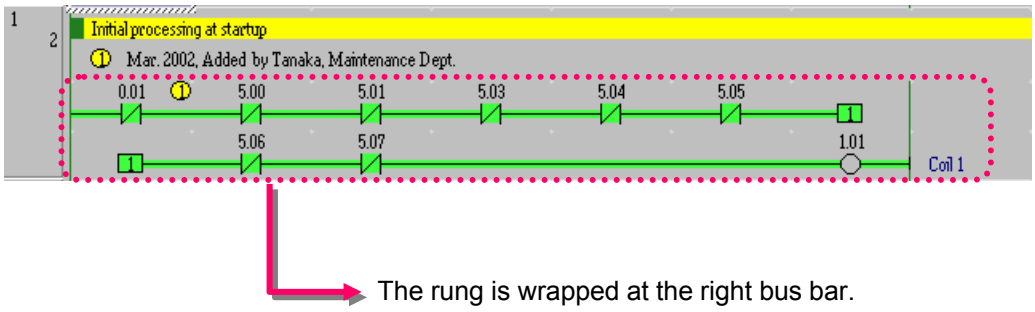
10. Monitoring - 7 Rung-wrap of Long Rung on Display

This function makes a rung longer than the right bus bar as shown in the below figure wrap when displayed.



Select [View] -> [Show in RungWrap].





The rung is wrapped at the right bus bar.

Once set, this function is always active until released by taking the reverse procedure of the above one.

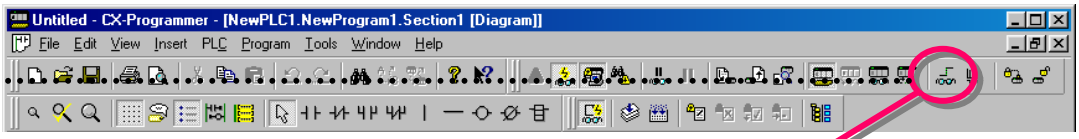
11. Monitoring - 8 Differential Monitor

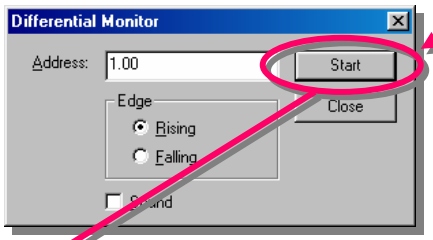
The function detects differential up/down of a specified bit and indicates that differential conditions are satisfied by sound or display.
The function eliminates the use of a trap rung for checking operation and improves the efficiency of programming and debug operations.

Move the cursor to a bit to be monitored.

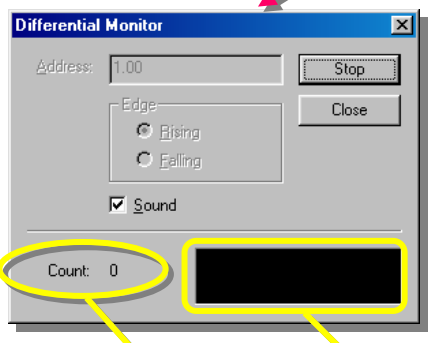
Click 

Or click the right mouse button on the applicable bit and select [Differential Monitor] from the popup menu.

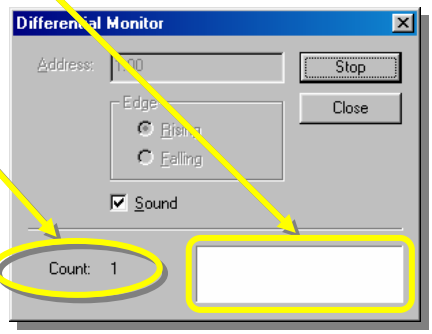




Click [Start].



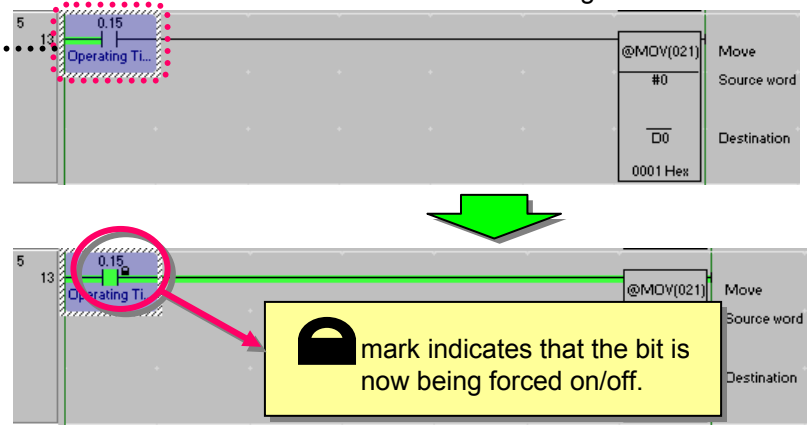
The count number is displayed on the dialog every time the differential condition (differential up in this example) is satisfied and the color of the box changes each time.



12. Force On/Off

Contacts/coils are forced on/off from CX-Programmer.

Move the cursor to a contact or coil that you want to force on/off.



Click the right mouse button. ->
[Force] -> [On]

Force Off/Cancel of bits/coils are enabled in the same way.

Shortcut Key
Ctrl+J: Force On
Ctrl+K: Force Off

Once bits/coils are forced on/off, the forced statuses are held until cancelled or the reverse procedures of on/off are taken.
The statuses do not change by an external input or the operational result of the program.
Moreover, force operations are not enabled when the PLC is in the Run mode.

13. Displaying List of Forced-on/off Bits

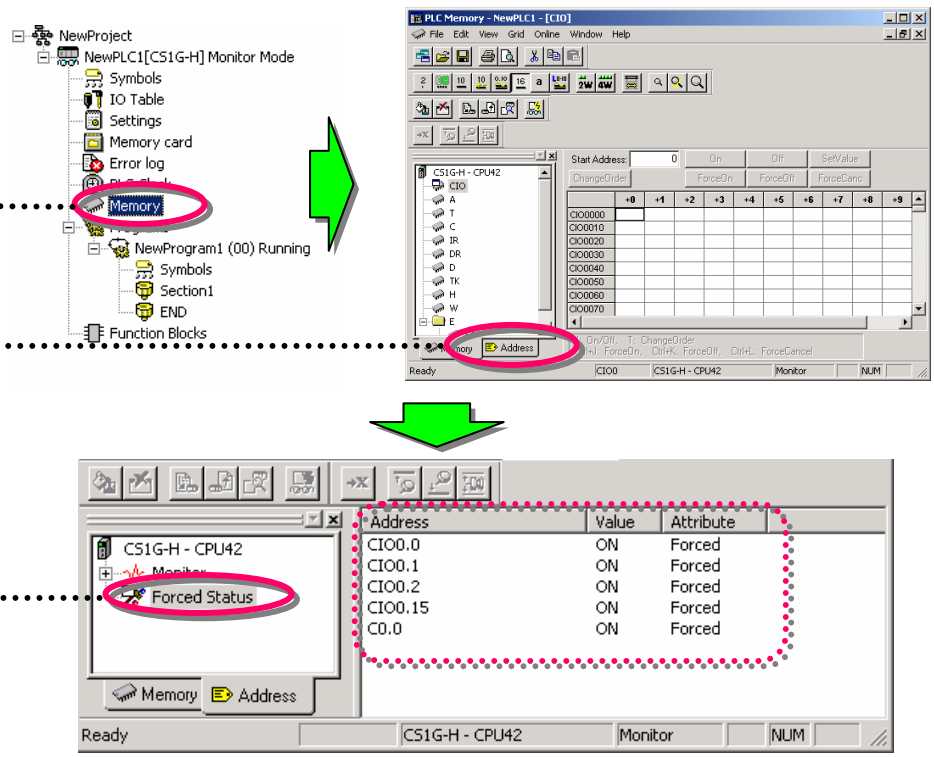
The bits forced on/off can be listed in a table.
This function enables you to check the forced statuses of more than one bit at a glance.

Display Project Workspace.
[Alt] + 1

Double-click [Memory].

Click the [Address] tab.

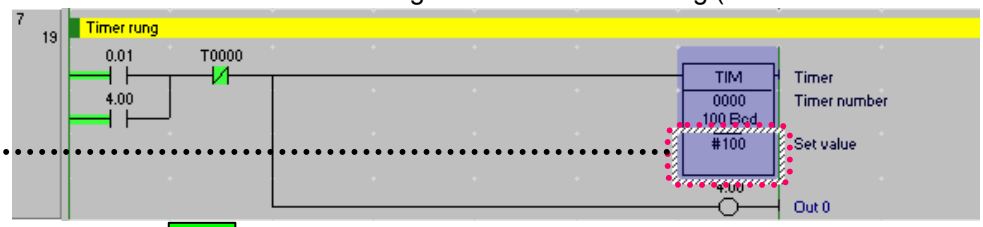
Double-click [Forced Status].



14. Changing Set Value of Timer

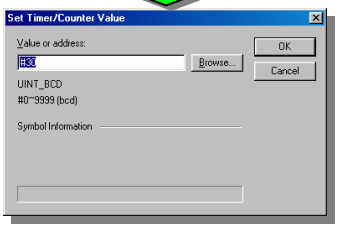
The set value of a timer is changed while CPU is running (in the Monitor mode only).

Move the cursor to the set value of a timer.

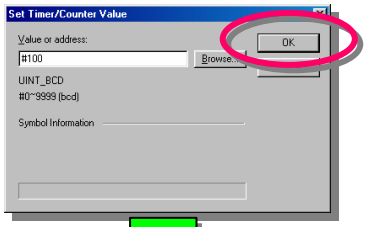


ENT

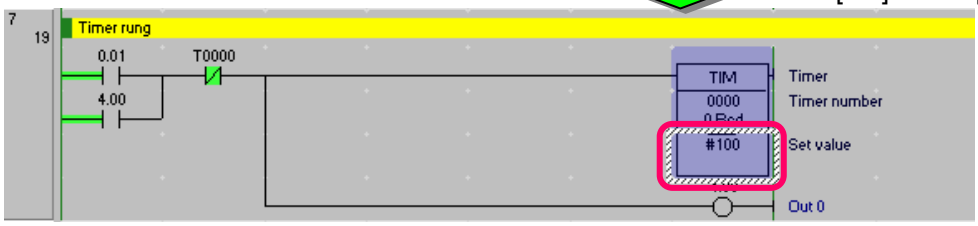
Or double-click.



Enter the new set value #100.



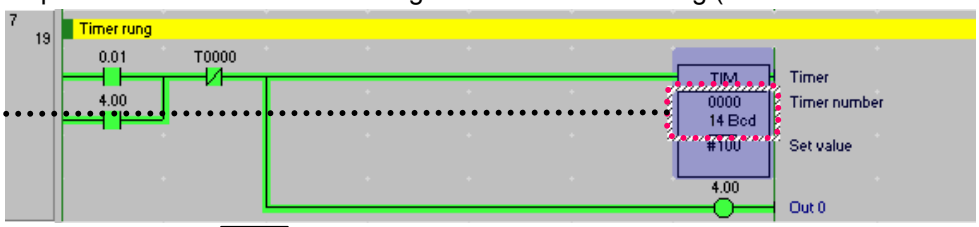
Click [OK] to complete.



15. Changing Present Value of Timer

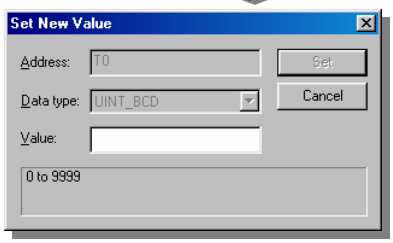
The present value of a timer is changed while CPU is running (in the Monitor mode only).

Move the cursor to the present value of a timer.

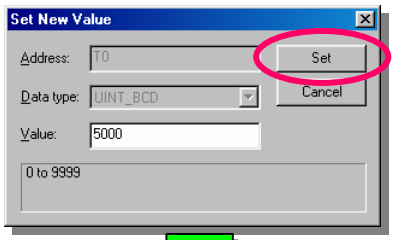


ENT

Or double-click.



Enter a new present value 5000.



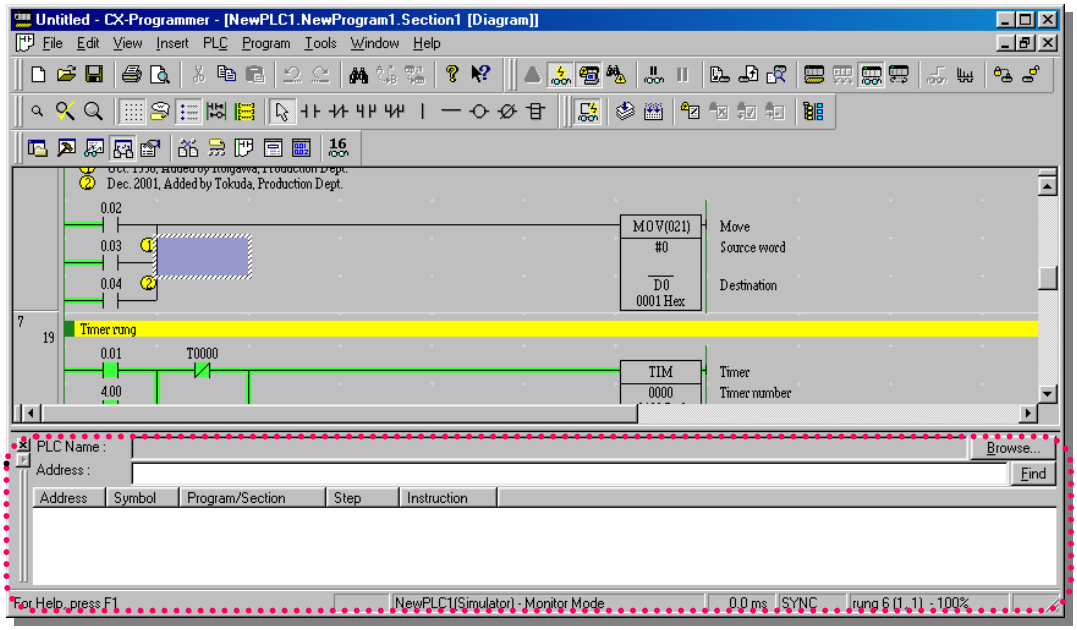
Click [Set] to complete.

Subtraction starts from the new value 5000.

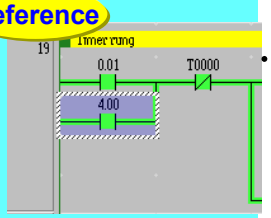
16. Find Function - 1 Find from Address Reference Tool

Display Address Reference Tool.

Alt + 4



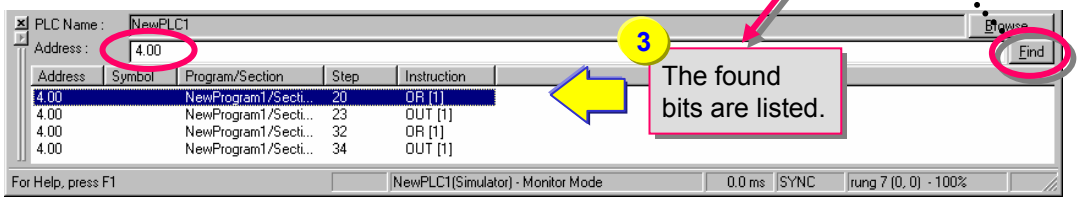
Reference



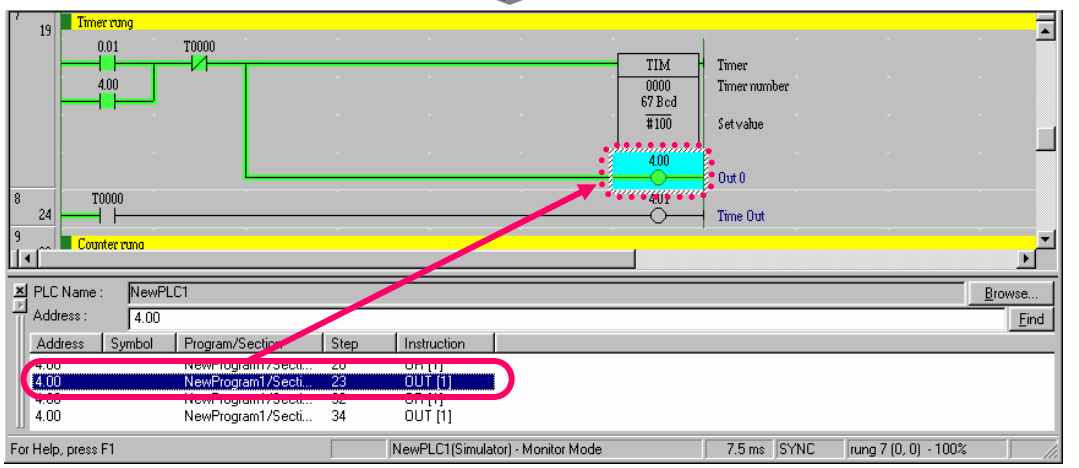
You can also move the cursor to a bit that you want to find.

1 Enter a bit number that you want to find in the [Address] field.

2 Click Find



3 The found bits are listed.



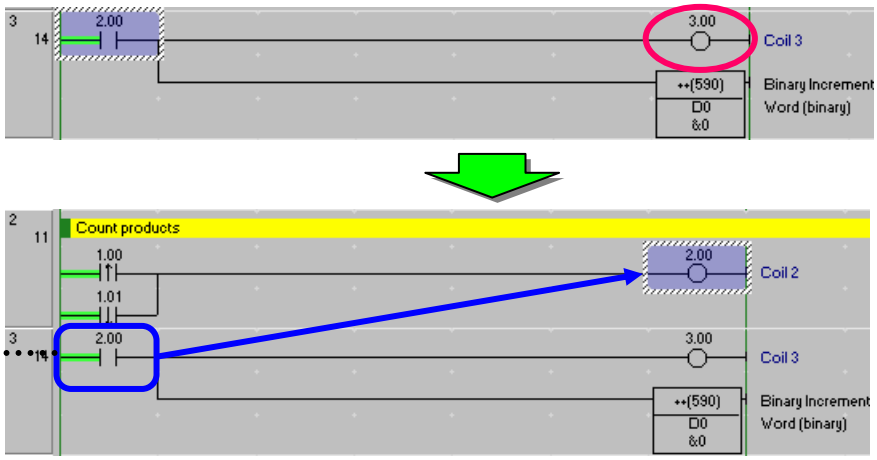
Click a bit that you want to find, and the focus will move to the corresponding position in the rung.

17. Find Function - 2 Retrace Find of Ladders

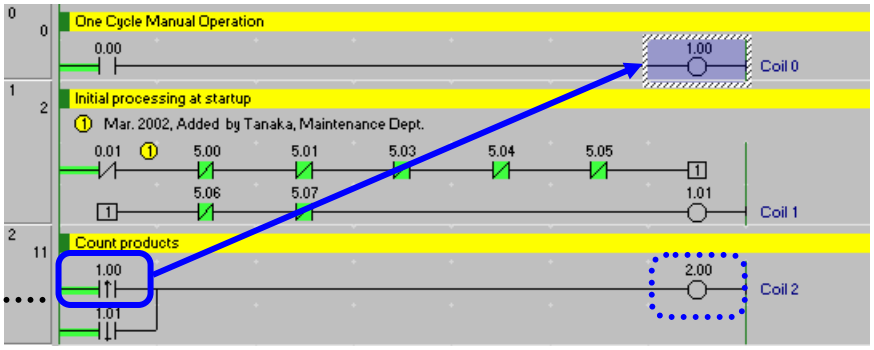
The function retraces ladder rungs so that you can find the causes of the coils not turned on.

(1)The reason why the coil 3.00 is not turned on is that its contact 2.00 is not turned on. Therefore, the function retraces rungs to find the coil 2.00.

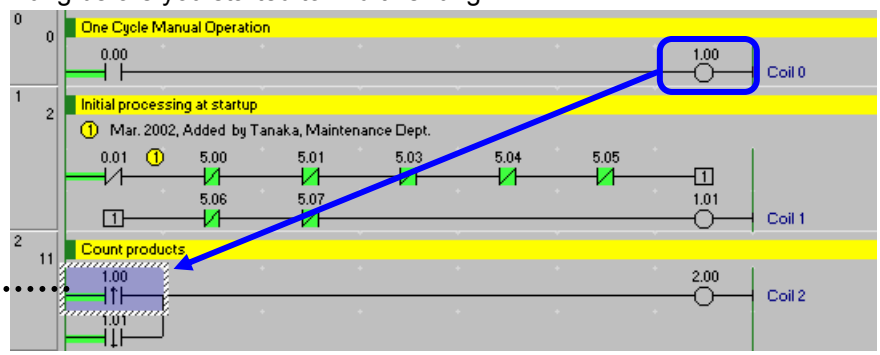
(2)Move the cursor to the following position (contact 2.00) and press the [Space] key.



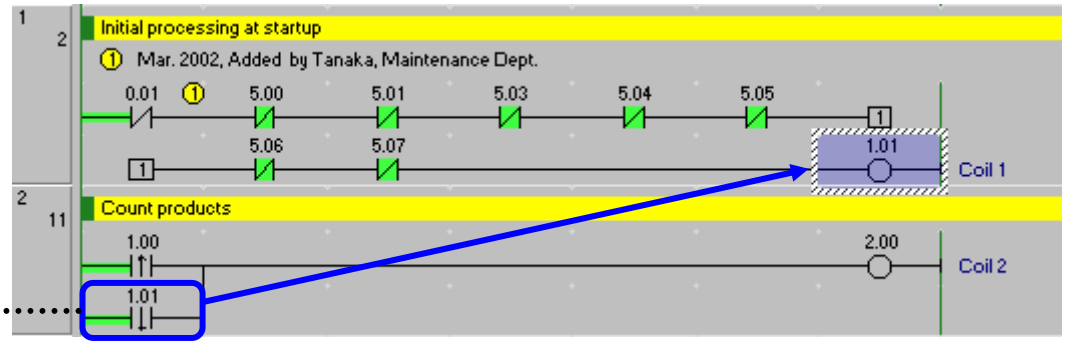
(3)The reason why the coil 2.00 is not turned on is that the contact 1.00 or 1.01 is not turned on. Suppose the cause is the contact 1.00 and find the coil of 1.00. Move the cursor to the contact 1.00 and press the [Space] key as well as the above operation (2).



(4)If this rung is not a cause press [Shift]+[Space], and you will able to go back to the rung before you started to find this rung.



(5)Then retrace rungs to find a cause from the contact 1.01. As well as the operations so far, move the cursor to the contact 1.01 and press the [Space] key.



(6)The focus moves to the coil 1.01. As it turned out, the cause was the contact 0.01 that was not turned on.

Press the [Space] key to jump from a coil to a contact having the same address as the coil or from a contact to a coil in reverse.

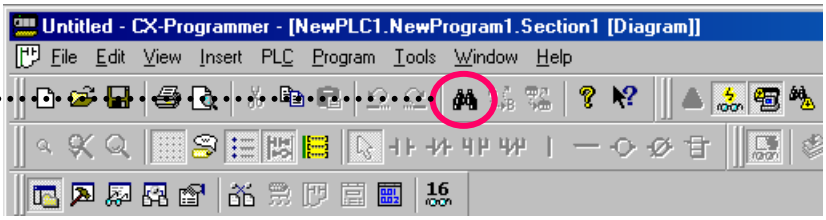
Press the [N] key for another jump from a contact or coil at the cursor position to a next one having the same address.
To move back to the position of the last jump, press the [B] key.

This is a useful function available in SYSMAC Support Software.
CX-Programmer inherits it.

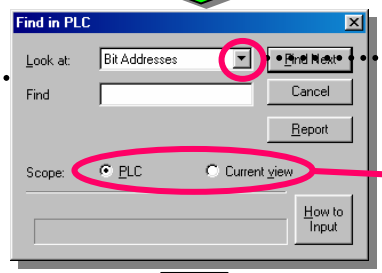
18. Find Function - 3 Find by Keyword in Comment

If you enter an operator's name or an operation date in annotations as a note at startup or maintenance, this function finds the bit or word that the name or date is used and displays the result on Output Window.

Click 



The [Find] dialog shows up.

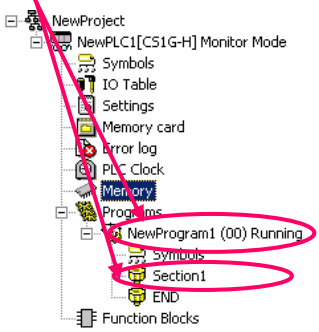


Click . Select [All (strings)] from the pull-down menu.

Scope of Find is specifiable.

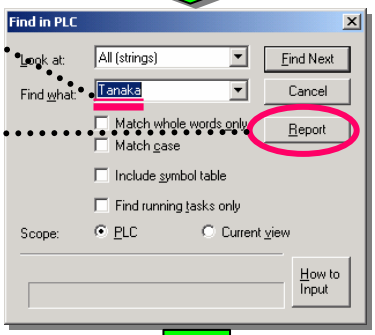
PLC
To find a target from all tasks (programs).

Current view
To find from a section or task (program) being edited
-> Click an icon in Project Workspace to select a task.

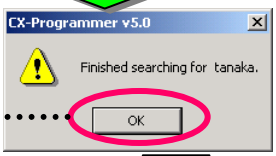


Enter a keyword to find.

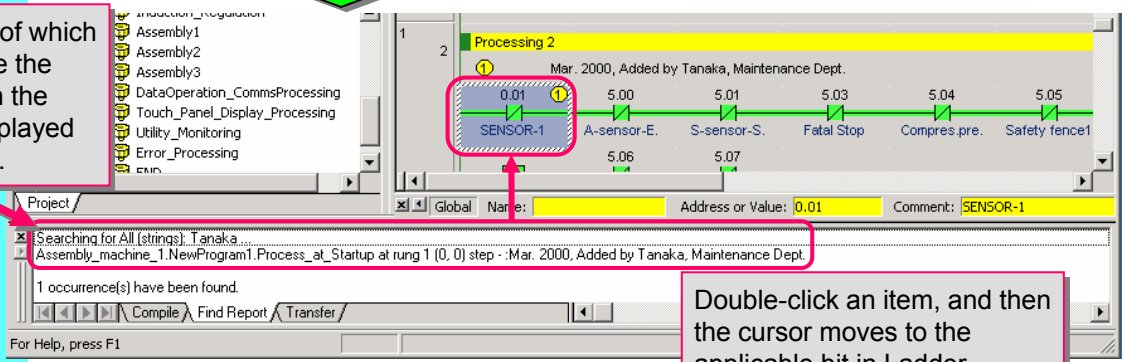
Click Report



Click [OK].



The contacts/coils of which annotations include the keyword entered in the Find dialog are displayed on Output Window.



Double-click an item, and then the cursor moves to the applicable bit in Ladder Window.

19. Find Function - 4 Go To Rung Comment

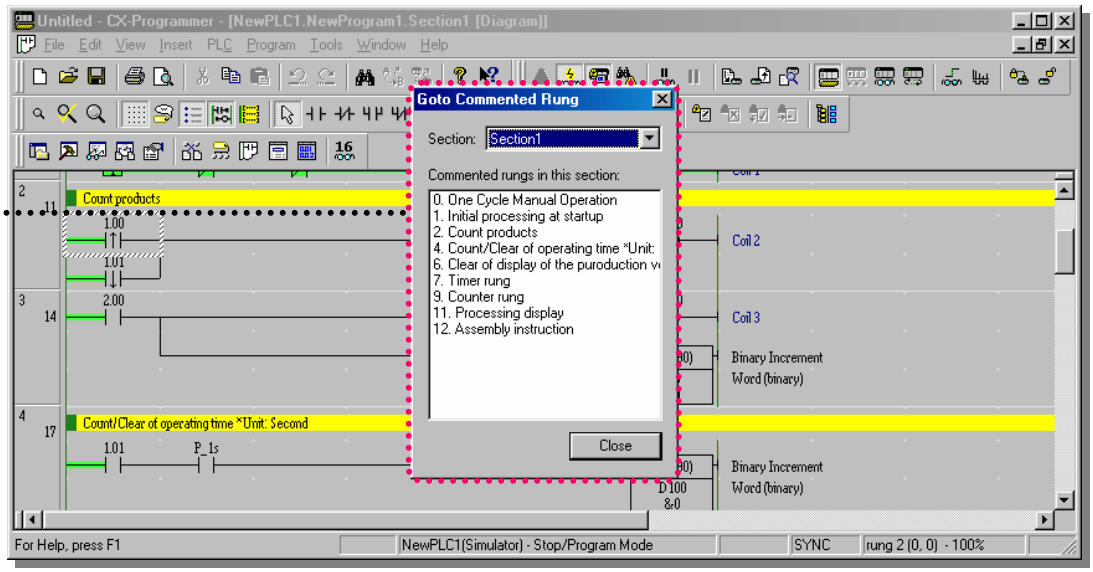
This is a function that displays a list of rung comments on the screen and moves the cursor to the position where a selected rung comment is used in the ladder.
Rung comments improve the efficiency of debug or maintenance of rungs divided into blocks per function.

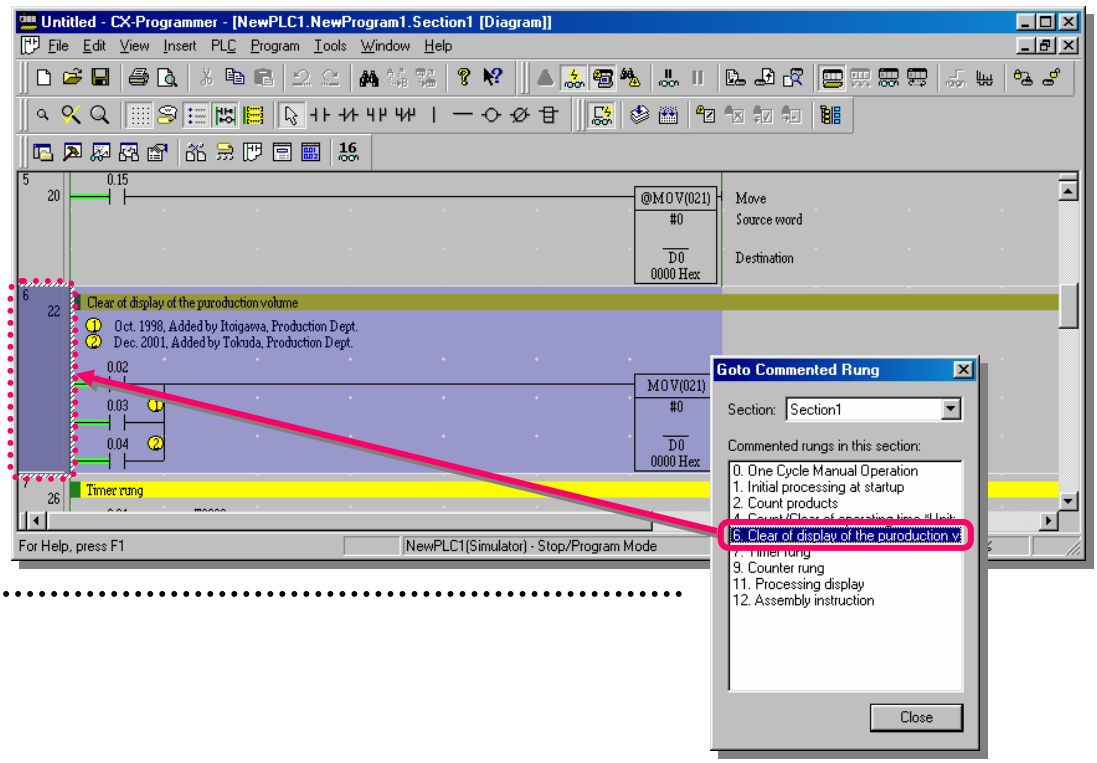
A list of the rung comments used in rungs are displayed on a separate window.

L

Or

Alt + Shift + R

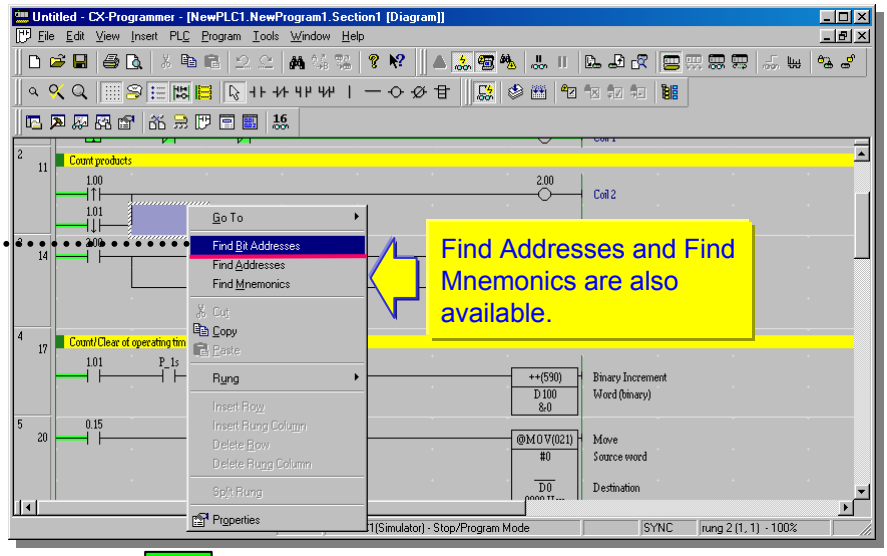




Click a rung comment in the list, and the cursor goes to the position where the rung comment is used in the ladder.

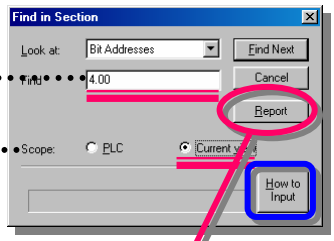
20. Find Function - 5 Find Bit Addresses

Click the right mouse button on Ladder Window. Select [Find Bit Addresses] from the popup menu.

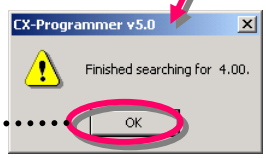


Enter an address (bit number) to find. (period between a channel and a bit is unnecessary.)

Set the scope of Find (Current view).

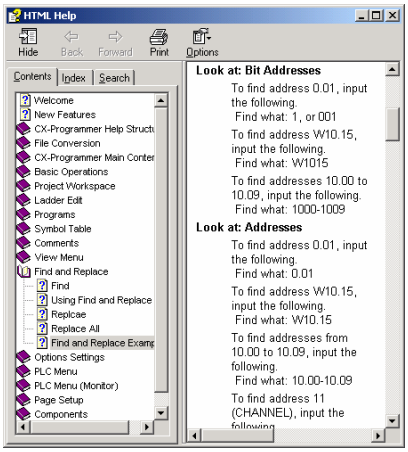


Click [Report].



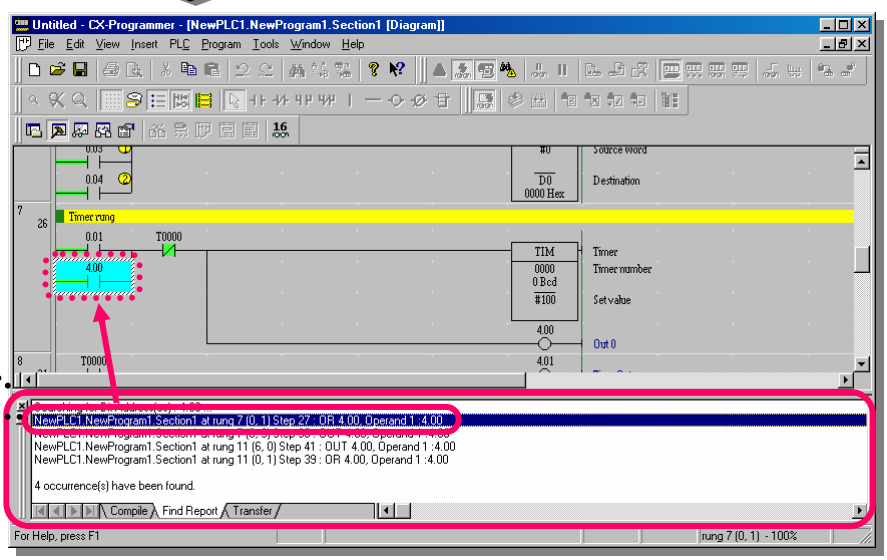
Click [OK].

Click the [How to Input] button, and the Help of [Find and Replace Examples] will be displayed.



Output Window is displayed and the results are listed.

Double-click an item in the list, and the cursor will go to the applicable bit.

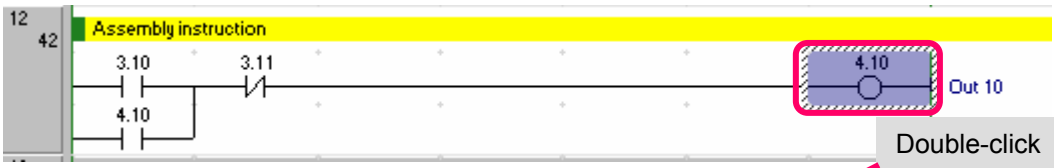


21. Online Edit

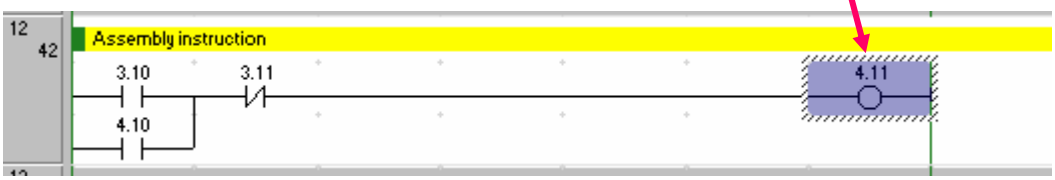
(1) Move the cursor to a rung you want to modify.

You can also select more than one rung by Drag&Drop with a mouse.

(2) Select [Program] -> [Online Edit] -> [Begin] from the CX-Programmer menu.



(3) Enter a bit number (4.11 in this example) you want to edit to.



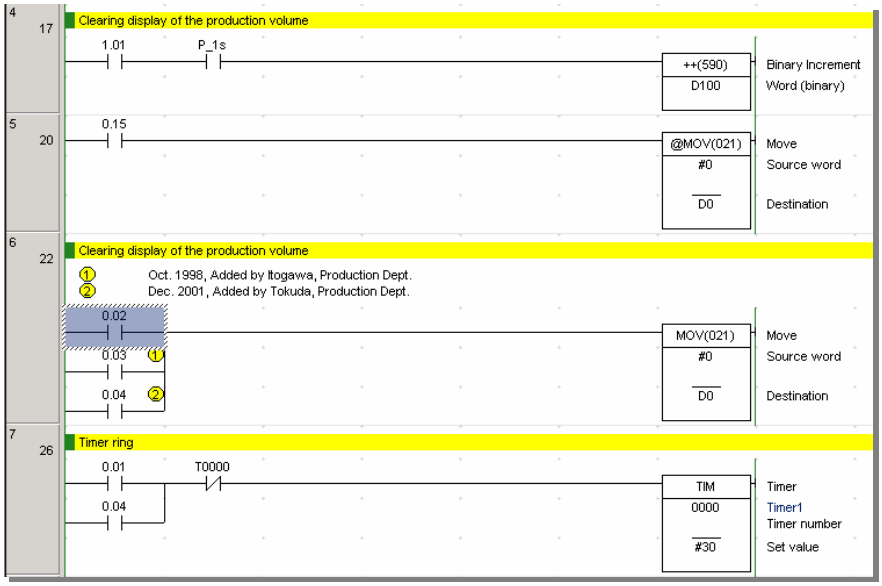
(4) Select [Program] -> [Online Edit] -> [Send Changes] from the menu.

End

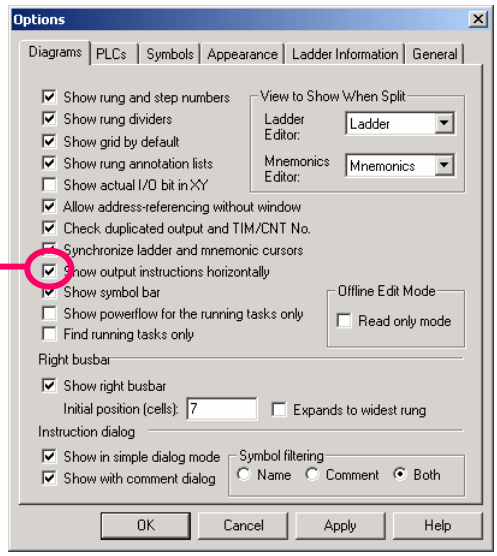
Useful Functions

You can select either vertical or horizontal display of output instructions.

Vertical display of output instructions

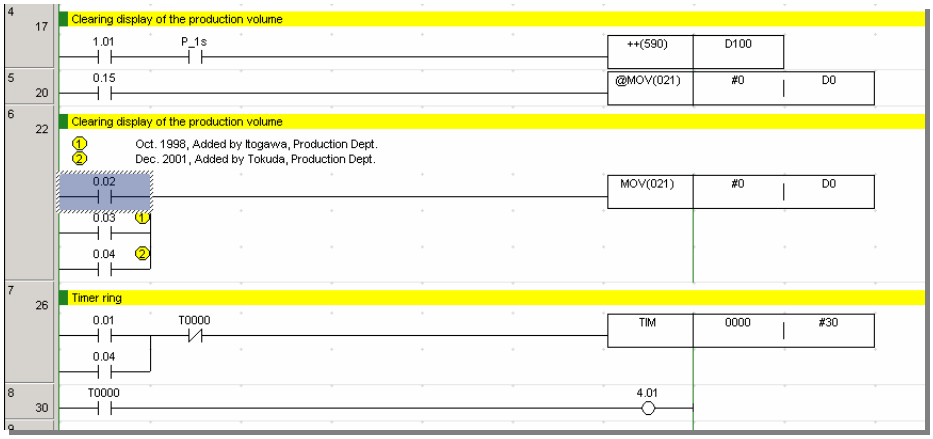


[Tools(T)] -> [Options(O)]



Check the [Show output instructions horizontally (H)] box.

Horizontal display of output instructions



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- Logistics systems for the shipment of materials almost anywhere in the world.
- Purchasing management, order record and tracking of shipments.

To access the product, click on the green button.

Product	Code	Reference	Product link
Control system, CPU 5120 E / S 250KW 448KW RS232C Data	135645	CS1H-CPU67H	Buy on EAN
Control system, Duplex CPU 5120 E / S 250 KW 448 KW Data Program	135745	CS1D-CPU67H	Buy on EAN
Control system, CPU 6/4 E / S Master Compobus NPN / S	297751	CPM2C-S100C	Buy on EAN
Control system, CPU 5120 Simplex E / S 250 KW 448 KW Data Program	168307	CS1D-CPU67S	Buy on EAN
Control system, CPU 6/4 E / S outputs PNP Compobus Master / Slave DeviceNet S	297724	CPM2C-S110C-DRT	Buy on EAN
Control system, CPU 6/4 E / S Master Compobus PNP / S	297723	CPM2C-S110C	Buy on EAN
Control system, CPU 640 E / S 20Kpasos 32KW 16 E / S	204821	CJ1M-CPU23	Buy on EAN
Control system, CPU 5120 E / S 60KW 128kW RS232C Data	153562	CS1G-CPU45H	Buy on EAN