EATON | Cutler-Hammer

ELCSoft

User Manual

January 2005

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ELCSoft User Manual

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1.1 Introductions and System Requirement

ELCSoft is a program editor of Eaton ELC series for WINDOWS. Except for general ELC program planning and general WINDOWS edition functions (e.g. cut, paste, copy, multi-windows, etc.), ELCSoft also provides various comment edition and other special functions (e.g. register editing, settings, the data readout, the file saving, and contacts monitor and set, etc.).

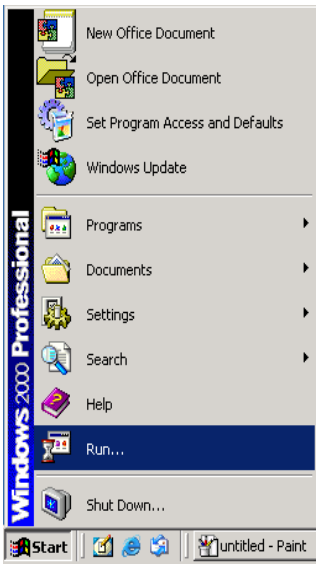
What follows is the system requirement to comply with the operation environment of ELCSoft:

Item	System Requirement
Operation System	Windows 95/98/2000/NT/ME/XP
CPU	Pentium 90 and above
Memory	16MB and above (32MB and above is recommended)
Hard Disk	Capacity: 50MB and above CD-ROM (for installing ELCSoft)
Monitor	Resolution: 640×480, 16 colors and above, It is recommended to set display setting of Windows to 800×600.
Mouse	General mouse or the device compatible with Windows
Printer	Printer with Windows driver
RS-232	At least one of COM1 ~ COM8 can connect to ELC
Adaptive Models	All Eaton ELC series

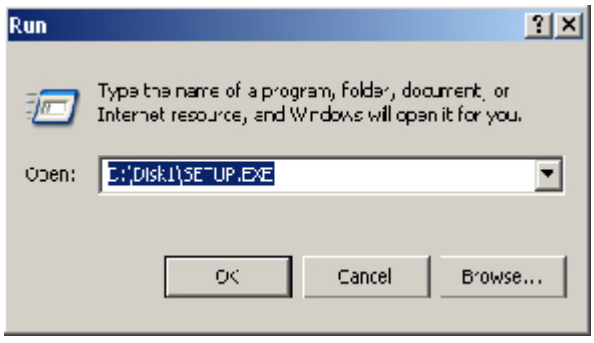
1.2 System Installations and Setup

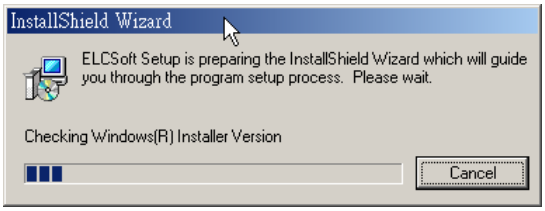
Start-up your computer to Windows 95/98/2000/NT/ME/XP system. Insert ELCSoft CD into the CD-ROM drive.

Press “START” button, and click on “RUN”.

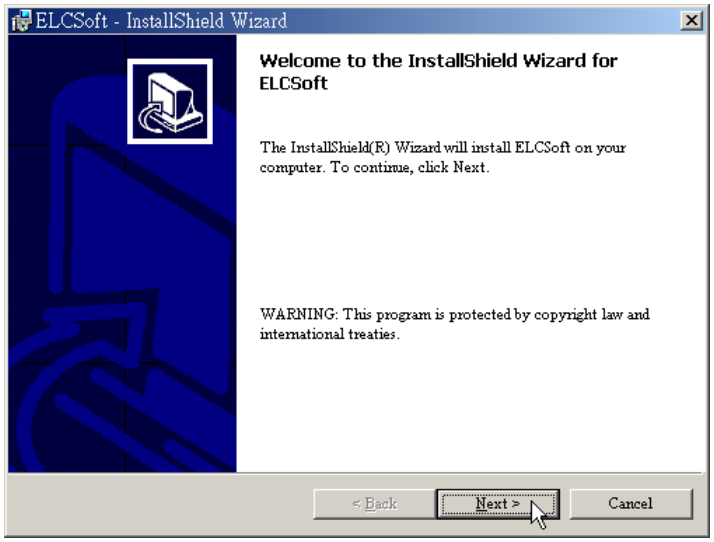


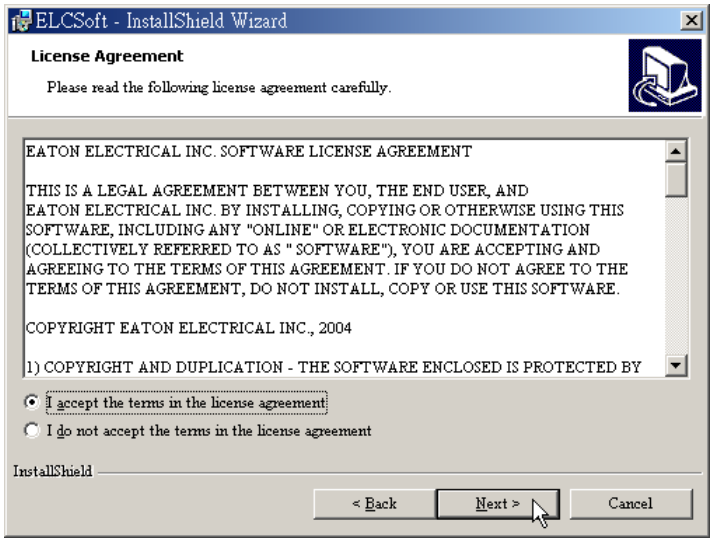
Designate the drive and location where ELCSoft is to be installed and saved.



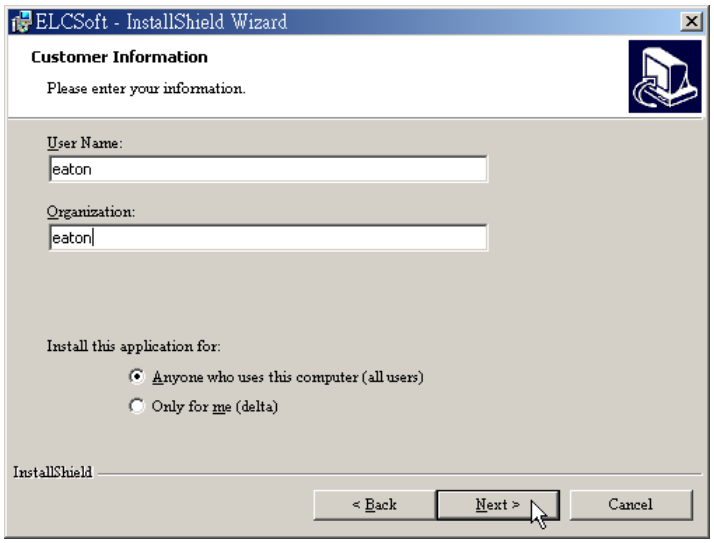


It will show the message box explaining the ELCSoft copyright and the system requirement; users could press the “Next>” button to proceed with the installation.

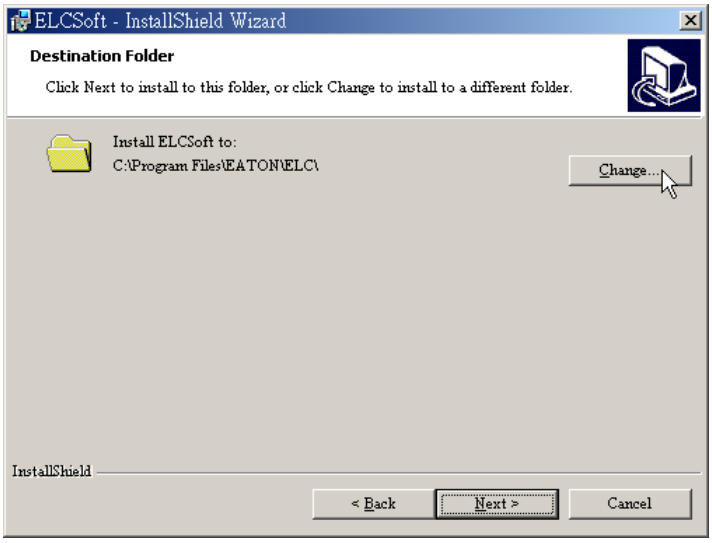




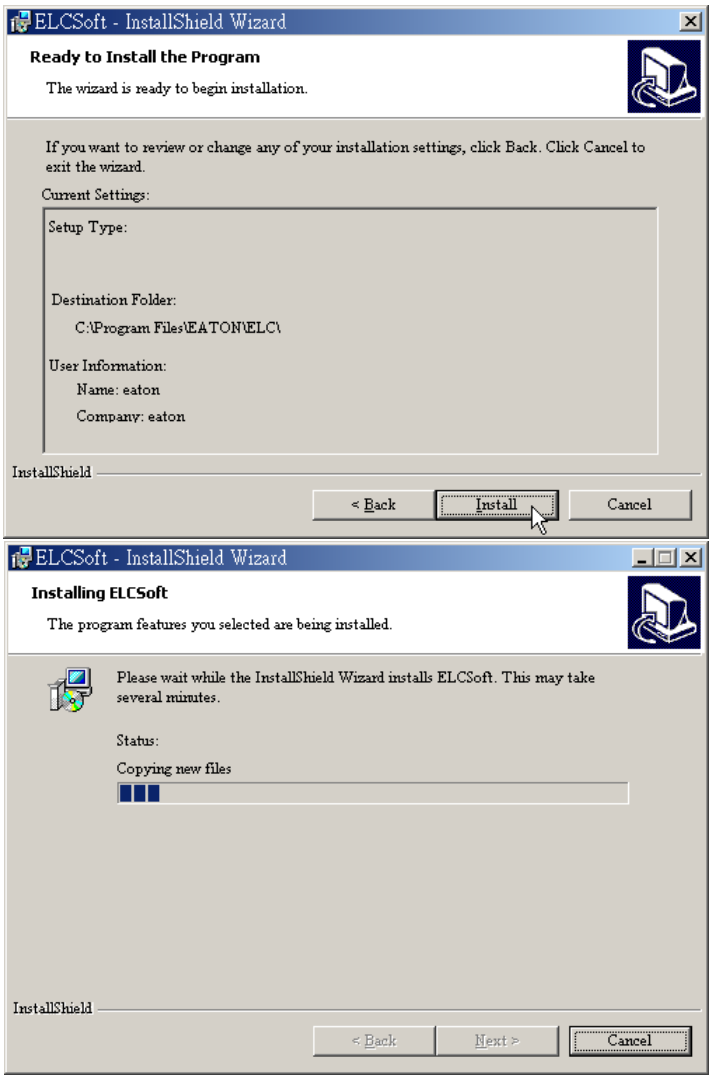
Key in the user name and the organization, then press “Next>” for the next step.



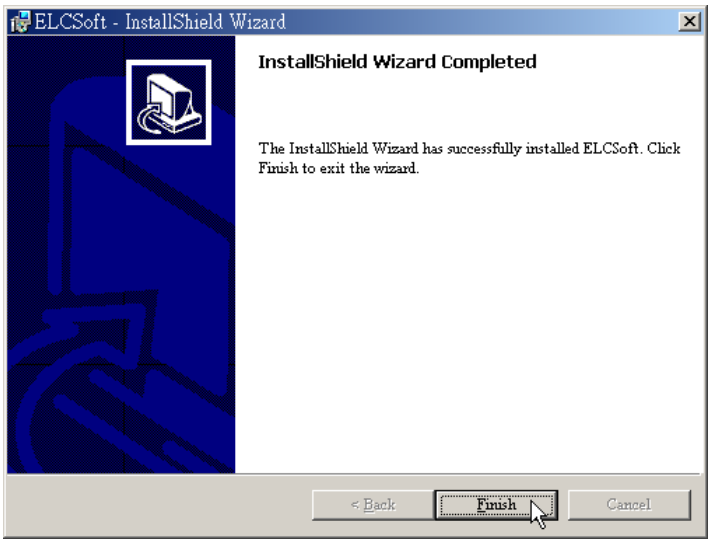
For the following procedure, simply press the “Next>” button to continue or press the “Change> button to change install path.



For the following procedure, simply press the “Install>” button to continue.



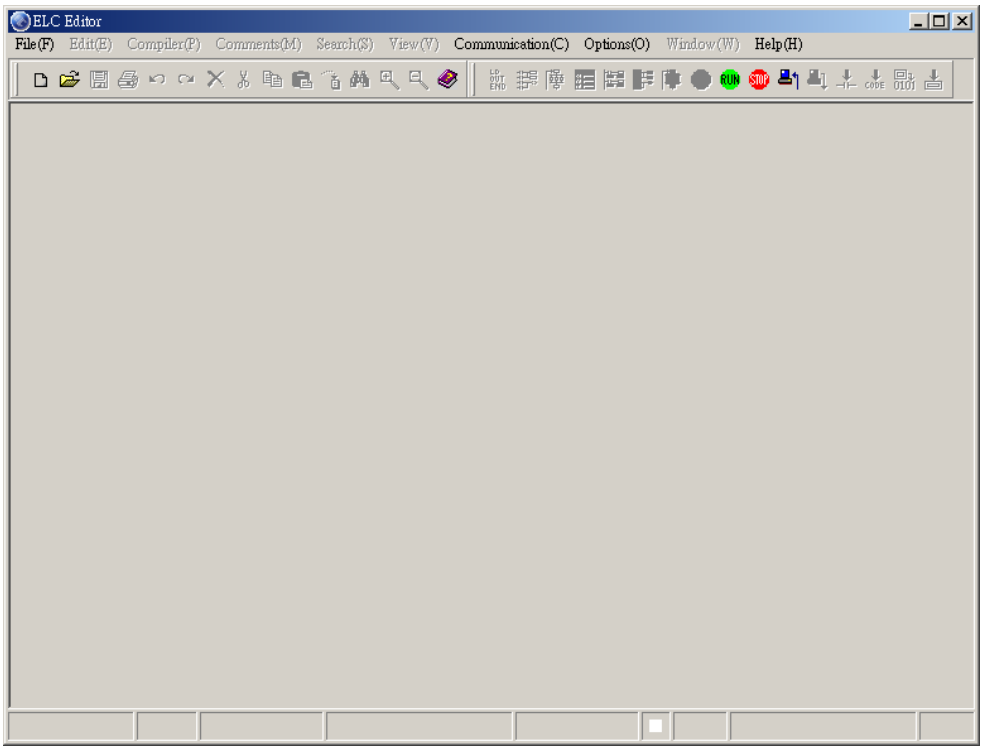
Finally, press the “Finish” button to complete the installation.



1.3 Program Execution

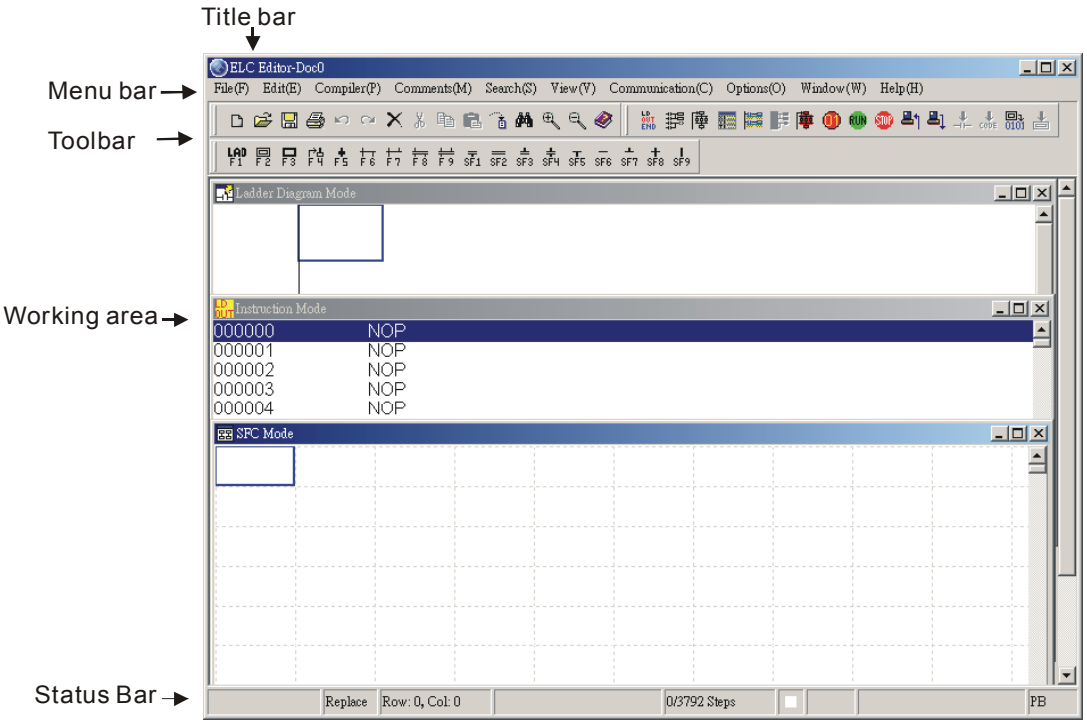
After finishing installation, ELCSoft will be installed in the default directory "C:\Program Files\Eaton\ELC". At this time, simply double-click the ELCSoft icon on your desktop to start the program or navigate to **Start>Programs>ELC>ELCSoft**. The start-up screen will display briefly. (see figure below).

Next, the ELC editor window will show up (see figure below). There are only File (F), Communication(C), Option(O) and Help(H) in the toolbar when executing ELC editor without opening new file.



It will open the last file you edited when entering ELCSoft at the second time.

Following is ELC editor introduction.



Title bar: display file name and directory that is editing.

Menu bar: there are ten items in menu bar: File(F), Edit(E), Compile(P), Comments(M), Search(S), View(V), Communication(C), Option(O), Window(W), and Help(H).

Toolbar: used to execute instruction by clicking directly. There are four types:

1. Standard toolbar:

2. ELCSoft toolbar:

3. Ladder diagram toolbar: (display in ladder diagram mode)

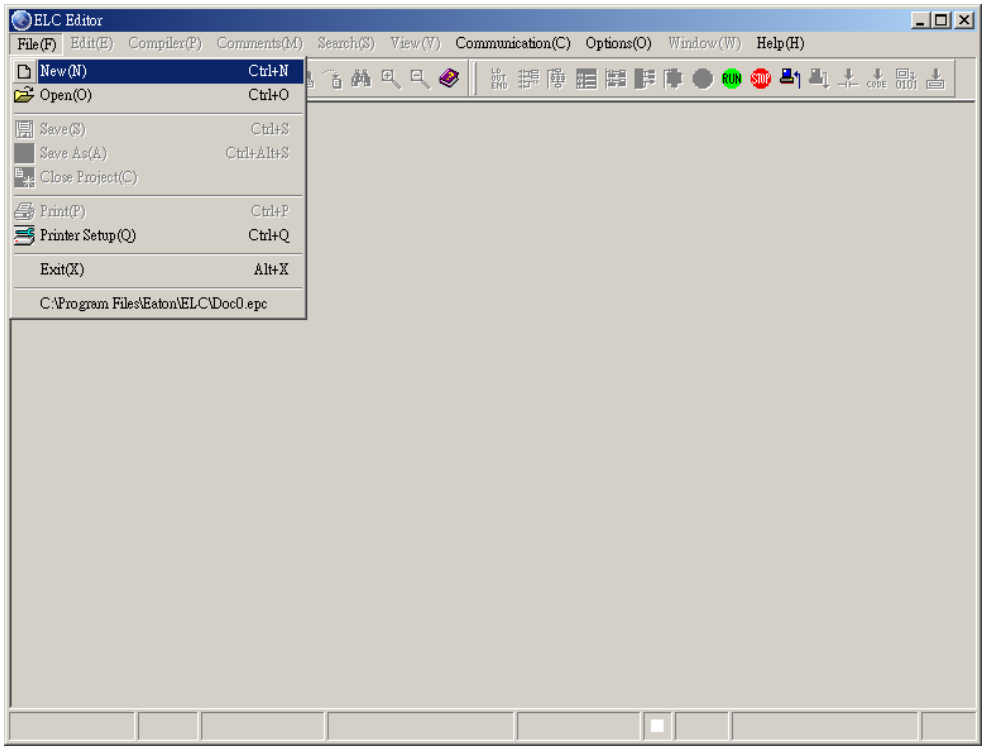
4. SFC toolbar: (display in SFC diagram mode)

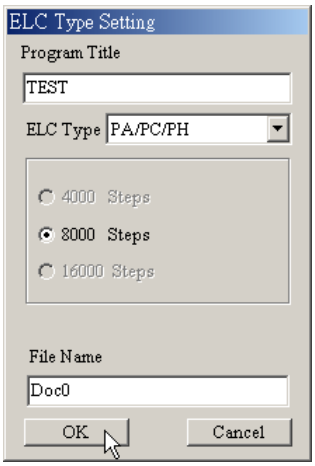
Working area: the area for design and program. The edition can be instruction edition, ladder diagram edition and SFC edition by requirement.

Status row: used to display messages, including replace/insert mode, edition coordinate, ELC scan time, program size after compiling, communication indication LED (blinking during communication), ELC status (RUN/STOP/HALT/ ERROR), ELC COM port number (baud rate), ELC models, etc.

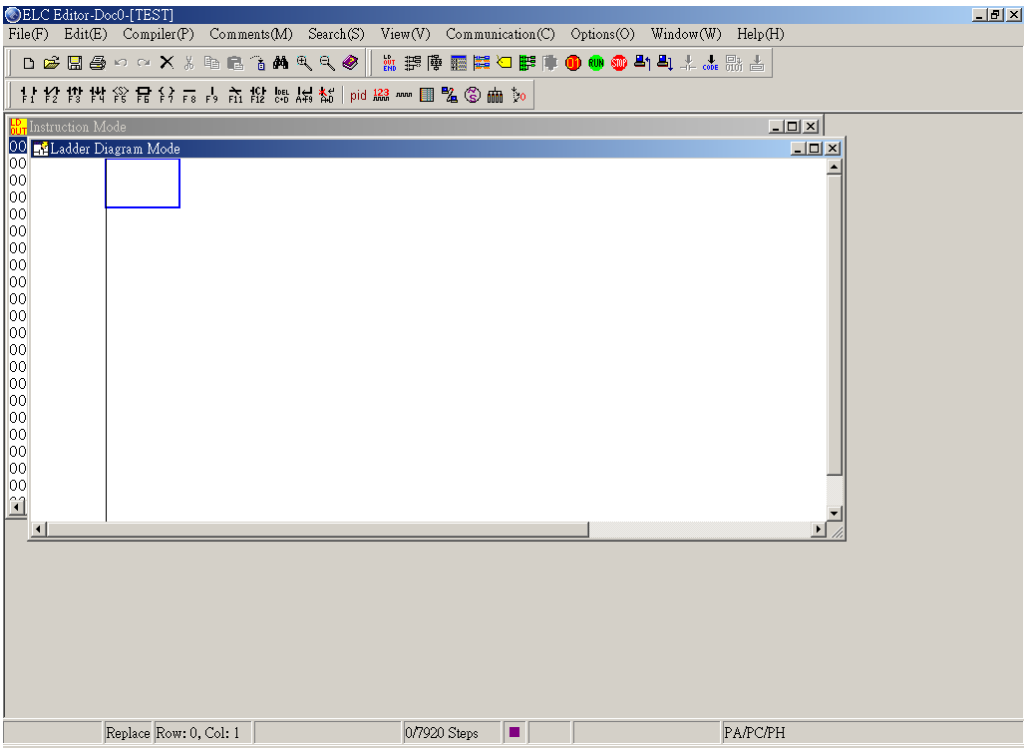
1.4 Initial Setup

After executing ELCSoft, it can open new file for ELC program design. It can set program title, ELC Type, program capacity (refer to the specification of ELC model name and program capacity) and file name.

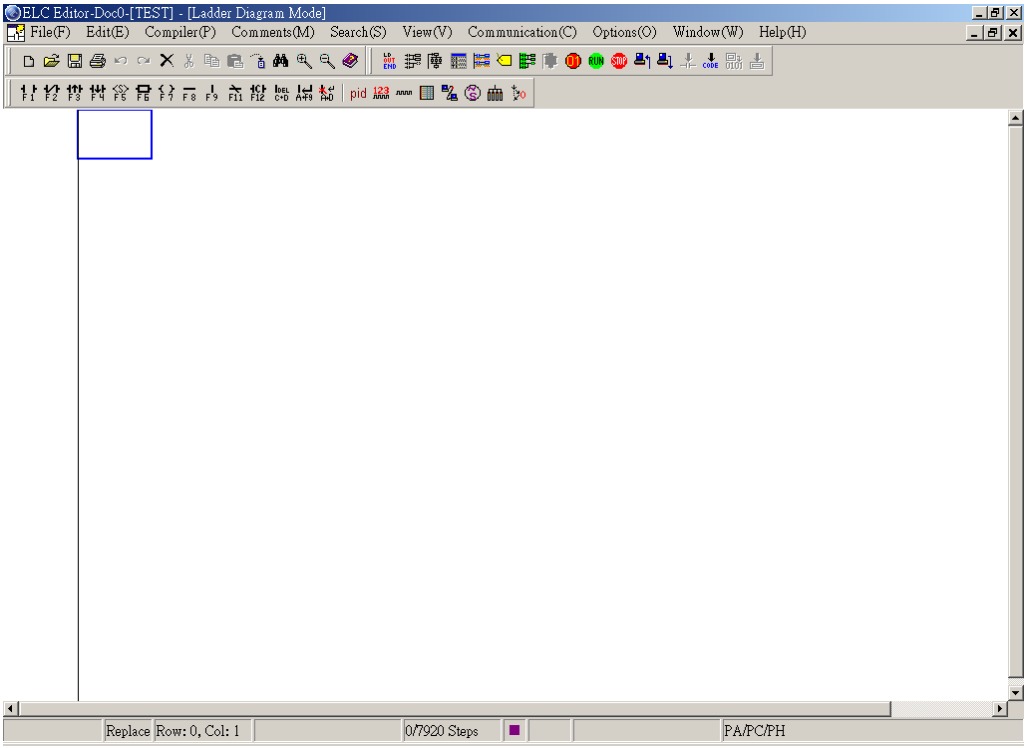




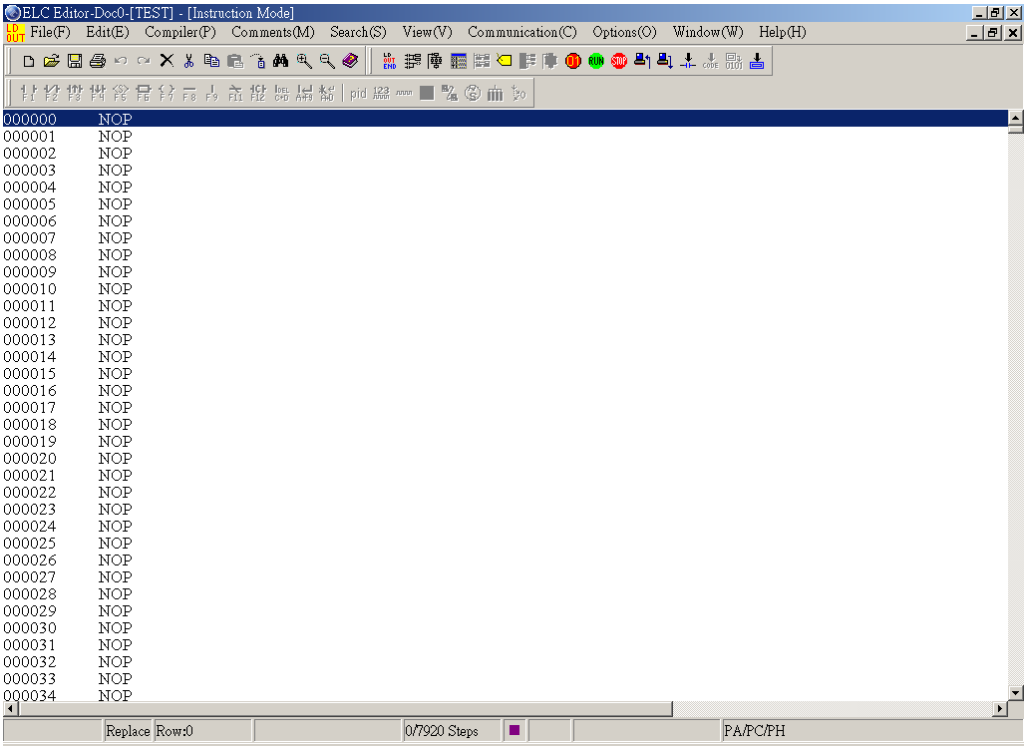
After above settings, there is two windows will be shown up: one is ladder diagram mode window and the other is instruction mode window. User can select the edition mode by their interests to edit ELC program.



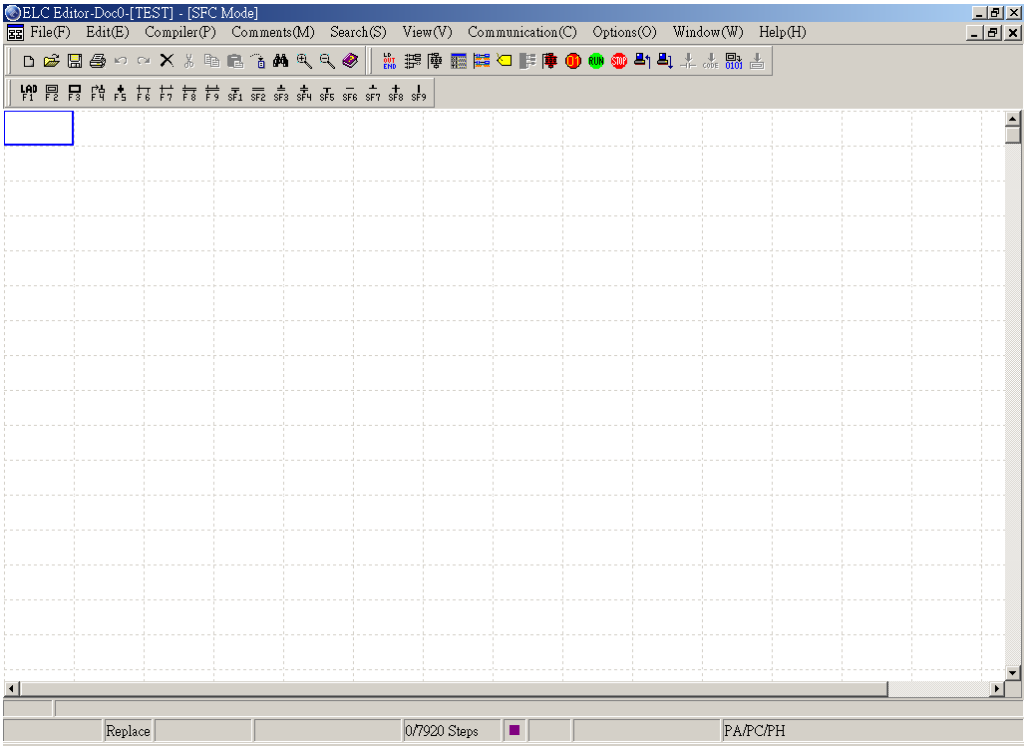
Ladder diagram mode: (it needs to convert to instruction code or SFC diagram by compiler to finish ladder diagram edition.)



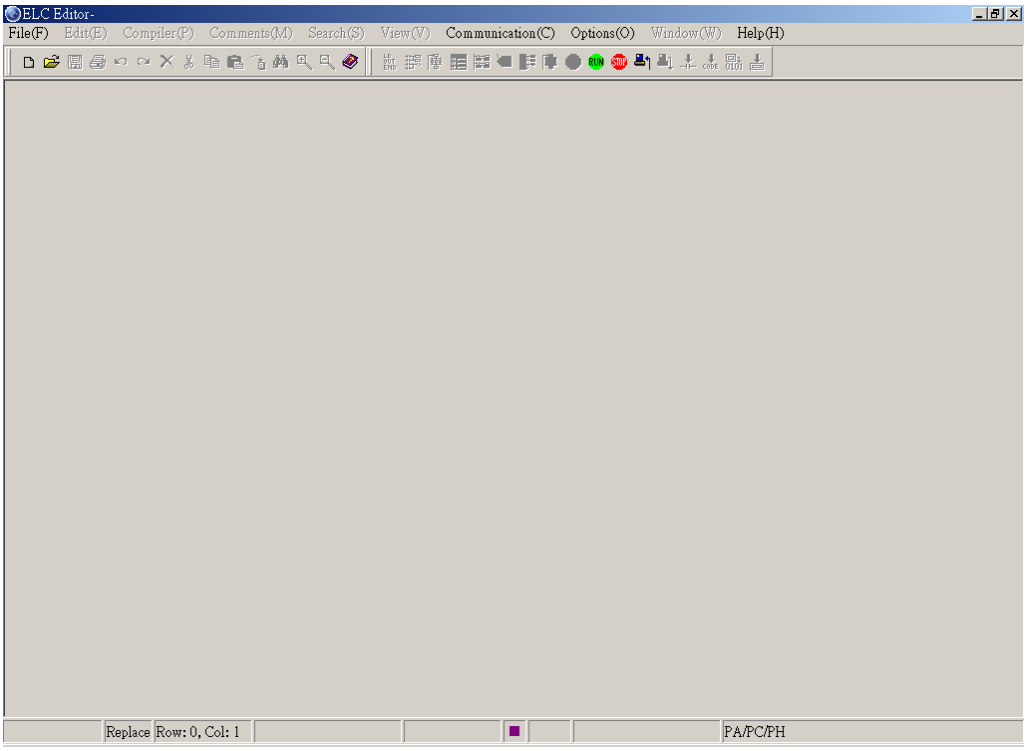
Instruction mode: (it needs to convert to instruction code or SFC diagram by compiler to finish ladder diagram edition.)



SFC edition mode: (it needs to convert to instruction code by compiler to finish SFC edition. If getting ladder diagram, it needs to convert instruction code to ladder diagram by compiler.)

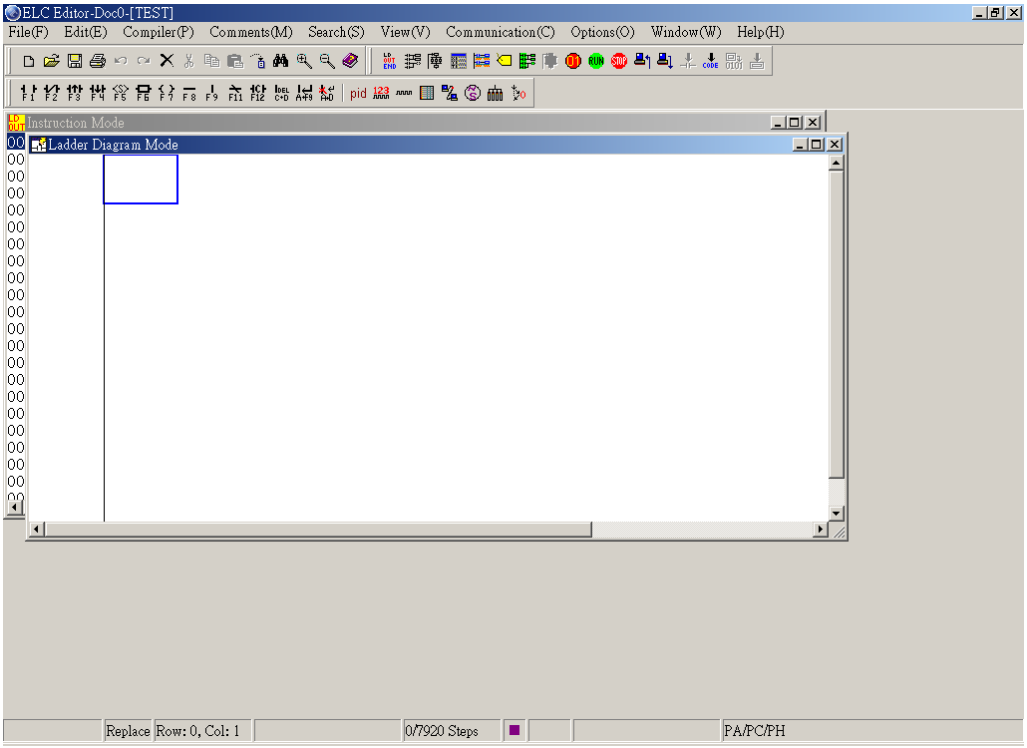


When ELCSoft is activated, the first window to show up is as follows; four selections: File, Communication, Option and Help, will be shown on the menu bar.



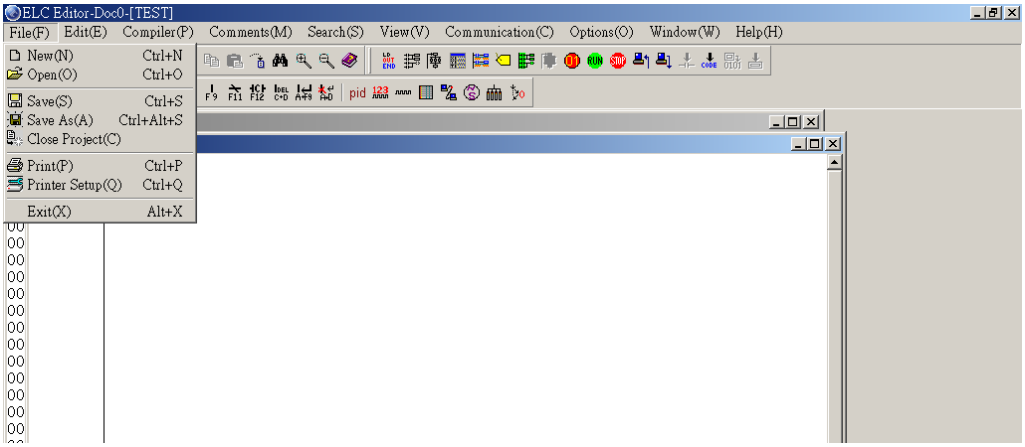
2 Introduction on the Menu Bar

After clicking “File” > “New”, the window below will be shown; some other selections: Edit, Compiler, Comments, Search, View, and Window will be listed on the menu bar. We will introduce them one by one.



2.1 File

The “File” function is shown as follows, including pull-down menu options:



- New(N) ⇨ Create a new file.
  - ◈ Method 1: Click “File” > “  New(N)”.
  - ◈ Method 2: Click the icon  on toolbar.
  - ◈ Method 3: Use keyboard shortcuts by pressing keys (Ctrl) + (N).
- Open(O) ⇨ open old file.
  - ◈ Method 1: Click “File” > “  Open(O)”.
  - ◈ Method 2: Click the icon  on toolbar.
  - ◈ Method 3: Use keyboard shortcuts by pressing keys (Ctrl) + (O).
- Save(S) ⇨ save current file.
  - ◈ Method 1: Click “File” > “  Save(S)”.
  - ◈ Method 2: Click the icon  on toolbar.
  - ◈ Method 3: Use keyboard shortcuts by pressing keys (Ctrl) + (S).
- Save as (A) ⇨ Save current file to another file name.
  - ◈ Method 1: Click “File” > “  Save as (A)”.
  - ◈ Method 2: Use keyboard shortcuts by pressing keys (Ctrl) + (Alt) + (S).
- Close project (C) ⇨ Close current file.
  - ◈ Method: Click “File” > “  Close project (C)”.
- Print (P) ⇨ Print current file (only print current window, i.e. one of ladder diagram/SFC/instruction mode).
  - ◈ Method 1: Click “File” > “  Print (P)”.
  - ◈ Method 2: Click the icon  from the toolbar.
  - ◈ Method 3: Use keyboard shortcuts by pressing keys (Ctrl) + (P).
- Printer Setup (Q) ⇨ Select and set printer.
  - ◈ Method 1: Click “File” > “  Printer Setup(Q)”.
  - ◈ Method 2: Use keyboard shortcuts by pressing keys (Ctrl) + (Q).

■ Exit ⇨ End ELCSoft.

◈ Method 1: Click “File” > “Exit(X)”.

◈ Method 2: Click the icon ✕ at the right upper corner of the window.

◈ Method 3: Use keyboard shortcuts by pressing keys (Alt) + (X).

File Explanation:

There will be 13 different extension names for save after finishing edition and compiler; actual files will vary according to the differences on the edition files. It is recommended to copy all the same file names with different extension name if you want to copy the completed program (including all program comments and settings) to other disk or directory. Besides, you only need to copy the file with extension name .EPC for execution file copy.

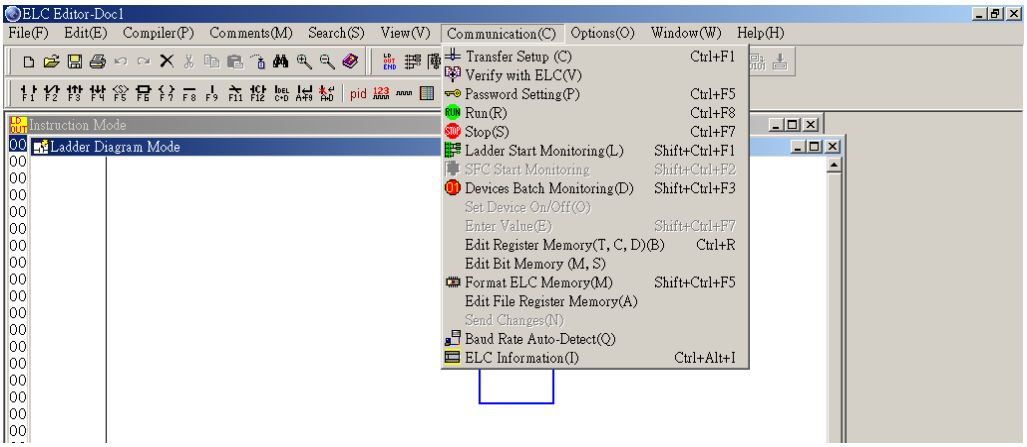
	Extension Name		Explanation
1	* .**EPC**	⇨	Execution file with program code; the file generated after the ladder diagram program has gone through a successful compiler
2	* .**LAD**	⇨	The ladder diagram file
3	* .**SFC**	⇨	SFC diagram file
4	* .**LMT**	⇨	The file used to record ladder diagram segment comment
5	* .**SMT**	⇨	The file used to record ladder diagram device comment
6	* .**LAB**	⇨	The file used to record label P and I
7	* .**RCM**	⇨	The default comment file for special D/special M
8	* .**WFT**	⇨	The file used to record file register
9	* .**DVL**	⇨	The file used to record register T, C and D
10	* .**DVB**	⇨	The file used to record device state (M and S)
11	* .**DEV**	⇨	The file used to record device monitor
12	* .**DUP**	⇨	The file used to save “Duplicate ELC Service”
13	* .**SYM**	⇨	The file used to record “Symbol Table”

For general programs that request a thorough backup file, it is necessary to copy the above-mentioned 13 files to make it complete. And to get a basic backup file, it is required to save those files with ELC as their extension names (* .EPC); what the user has to do is to use ELCSoft to reload this file and files with extension names LAB, LAD and SFC (*.LAB, *.LAD and *.SFC) would be generated after compiling. If the user wants to backup file before successful compiler, it needs to save those files with the extension name LAD (*.LAD). By the same way, if the user wants to backup file before successful compiler, it needs to save those files with the extension name SFC (*.SFC). If you want to see the

complete comments in backup program, you should also save comments file.

2.2 Communication

The “Communication” function is shown as follows:



- Transfer Setup(C) ⇨ PC communicates with ELC or HHP and read/write program
  - ◈ Method 1: Click “Communication” > “ Transfer Setup(C)”.
  - ◈ Method 2: Click the icon to download program to ELC or click the icon to upload to PC.
  - ◈ Method 3: Use keyboard shortcuts by pressing keys (Ctrl) + (F1).
- Verify with ELC(V) ⇨ to verify if current ELC program is the same as editing program
  - ◈ Method: “Communication” > “ Verify with ELC(V)”.
- Password Setting(P) ⇨ set or remove ELC password.
  - ◈ Method 1: Click “Communication” > “ Password Setting(P)”.
  - ◈ Method 2: Use keyboard shortcuts by pressing keys (Ctrl) + (F5).
- Run(R) ⇨ to execute ELC.
  - ◈ Method 1: Click “Communication” > “ Run(R)”.
  - ◈ Method 2: Click the icon on the toolbar.
  - ◈ Method 3: Use keyboard shortcuts by pressing keys (Ctrl) + (F8).

- Stop(S) ⇨ to stop executing ELC.
  - ◈ Method 1: Click “Communication(C)” > “ Stop(S)”.
  - ◈ Method 2: Click the icon on the toolbar.
  - ◈ Method 3: Use keyboard shortcuts by pressing keys (Ctrl) + (F7).
- Ladder start monitoring(L) ⇨ switch to ladder diagram monitor mode (only for ladder diagram mode).
  - ◈ Method 1: Click “Communication(C)” > “ Ladder start monitoring (L)” or “Stop monitoring ladder diagram(L)”.
  - ◈ Method 2: Click the icon on the toolbar.
  - ◈ Method 3: Use keyboard shortcuts by pressing keys (Shift) + (Ctrl) + (F1).
- SFC start monitoring ⇨ switch to SFC monitor mode (only for SFC mode).
  - ◈ Method 1: Click “Communication(C)” > “ SFC start monitoring” or “SFC Stop monitoring”.
  - ◈ Method 2: Click the icon on the toolbar.
  - ◈ Method 3: Use keyboard shortcuts by pressing keys (Shift) + (Ctrl) + (F2).
- Devices batch monitoring(D) ⇨ change to monitor device to get the information of device state and value.
  - ◈ Method 1: Click “Communication(C)” > “ Devices batch monitoring(D)”.
  - ◈ Method 2: Click the icon on the toolbar.
  - ◈ Method 3: Use keyboard shortcuts by pressing keys (Shift) + (Ctrl) + (F3).
- Set Device On/Off(O) ⇨ Force devices (Y, M, S, T and C) to be set as On or Off. (Only for monitor mode).
  - ◈ Method 1: Click “Communication(C)” > “Set Device On/Off(O)”.
  - ◈ Method 2: Put the mouse pointer on the device in ladder diagram mode and then Right-click to get the instructions “Set On” and “Set Off”.

- Enter Value(E) ⇨ Change the current value of the designated device register (T, C and D). (only for ladder diagram monitor mode or device monitor mode)

  ◈ Method 1: Click “Communication(C)” > “Enter Value (E)”.

  ◈ Method 2: Put the mouse pointer on the device in ladder diagram mode and then right-click to get the instructions “Enter value”.

  ◈ Method 3: Use keyboard shortcuts by pressing keys (Shift) + (Ctrl) + (F7).

- Edit Register Memory (T,C,D)(B)⇨ Proceed with functions such as read, write, print, file readout, and save the file within internal registers (T, C and D) of the ELC.

  ◈ Method 1: Click “Communication(C)” > “Edit Register Memory (T,C,D) (B)”.

  ◈ Method 2: Use keyboard shortcuts by pressing keys (Ctrl) + (R).

- Edit Bit Memory (M, S) ⇨ Proceed with functions such as read and save the file within internal registers (M and S) of the ELC.

  ◈ Method 1: Click “Communication(C)” > “Edit Bit Memory (M, S)”.

- Format ELC Memory(M) ⇨ clear ELC memory and set ELC to factory settings (the ELC is communicating with ELCSoft).

  ◈ Method 1: Click “Communication(C)” > “  Format ELC Memory (M)”.

  ◈ Method 2: Use keyboard shortcuts by pressing keys (Shift) + (Ctrl) + (F5).

- Edit File Register Memory(A) ⇨ Proceed with functions such as read, write, file readout, and save the file within file registers of the ELC.

  ◈ Method: Click “Communication(C)” > “Edit File Register Memory (A)”.

- Send Changes(N)⇨ the device can be updated online for ELC PC/PA/PH series. (online update means update program when ELC is running)

  ◈ Method: Click “Communication(C)” > “Send Changes(N)”.

- Baud Rate Auto-Detect(Q) ⇨ It will detect current ELC model, communication baud rate and communication protocol according to the COM Port setting in “Options(O)” > “Select COM Port(P)”. It will display ELC information, including ELC series, communication protocol and PC COM port when ELC connects to PC correctly.

  ◈ Method: Click “Communication(C)” > “  Baud Rate Auto-Detect(Q)”

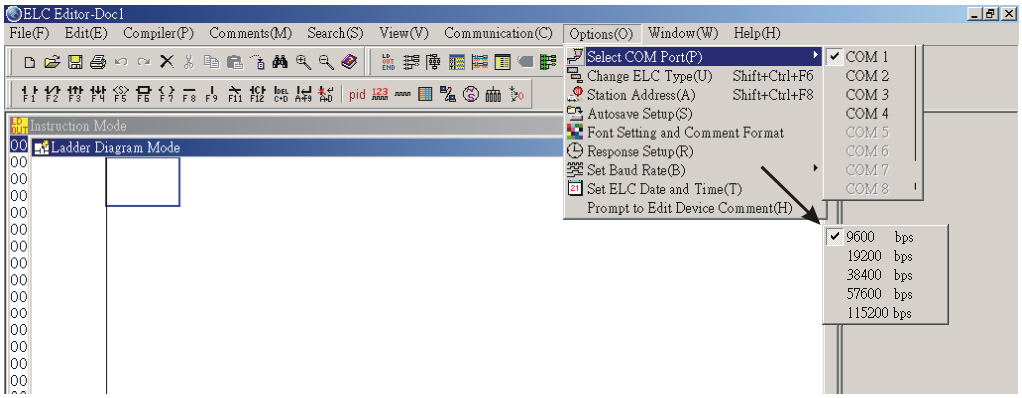
■ ELC Information ⇨ It will display current ELC information, including ELC state, capacity, ELC version, host, slave address, syntax check, error address and lock state.

◈ Method 1: Click “Communication(C)” > “ ELC information(I)”.

◈ Method 2: Use keyboard shortcuts by pressing keys (Ctrl) + (Alt) + (I).

2.3 Options

The “Options” function is shown as follows:



■ Select COM Port(P) ⇨ ELCSoft will detect applicable PC COM port and user can choose one of applicable COM port to connect to ELC.

◈ Method: Click “Options” > “ Select COM Port(P)”

■ Change ELC type(U) ⇨ it is used to set program title, ELC type setting (PB and PC/PA/PH), program capacity (4000, 8000 and 16000 Steps) and file name.

◈ Method 1: Click “Options” > “ Change ELC type(U)”

◈ Method 2: Use keyboard shortcuts by pressing keys (Shift) + (Ctrl) + (F6).

■ Station Address(A) ⇨ Default address of ELCSoft is 1. It means that PC connects to the ELC, which the address is 1 (D1121). The setting range is from 0 to 255.

◈ Method 1: Click “Options” > “ Station Address(A)”

◈ Method 2: Use keyboard shortcuts by pressing keys (Shift) + (Ctrl) + (F8)

■ Autosave Setup(S) ⇨it is used to save file automatically before compiling or for a time interval (5 minutes~60 minutes).

◈ Method: Click “Options” > “ Autosave Setup(S)”

- Font Setting and Comment Format ⇨ there are 16-color for user to set the display color of ladder diagram, ladder text, ladder symbol, ladder cursor, ladder monitor state, ladder device comment, ladder segment comment, ladder row comment and ladder monitor value. It also provides those fonts that Windows® uses. The text of device comment and row comment also can be arranged in this setting. It also provides symbol name display enabled or disable.

  ◈ Method: Click “Options” > “ Font Setting and Comment Format”

  ⊙.symbol name display enabled or disable

  ◈ Method 1: Click “Options” > “ Font Setting and Comment Format” choice symbol name display enabled.

  ◈ Method 2: Click the icon on the toolbar.

- Response Setup(R) ⇨ it is used to set the auto query times (1-50 times) and query interval time (3-10 seconds) when transmission error occurs.

  ◈ Method: Click “Options” > “ Response Setup(R)”

- Set Baud Rate(B) ⇨ the communication baud rate of ELC-PC/PA/PH series can be 9600, 19200, 38400, 57600 and 115200 bps.

  ◈ Method: Click “Options” > “ Set Baud Rate(B)”

- Set ELC Date and Time(T) ⇨ user can set RTC settings of ELC-PC/PA/PH series to be the same as computer RTC or defined by user.

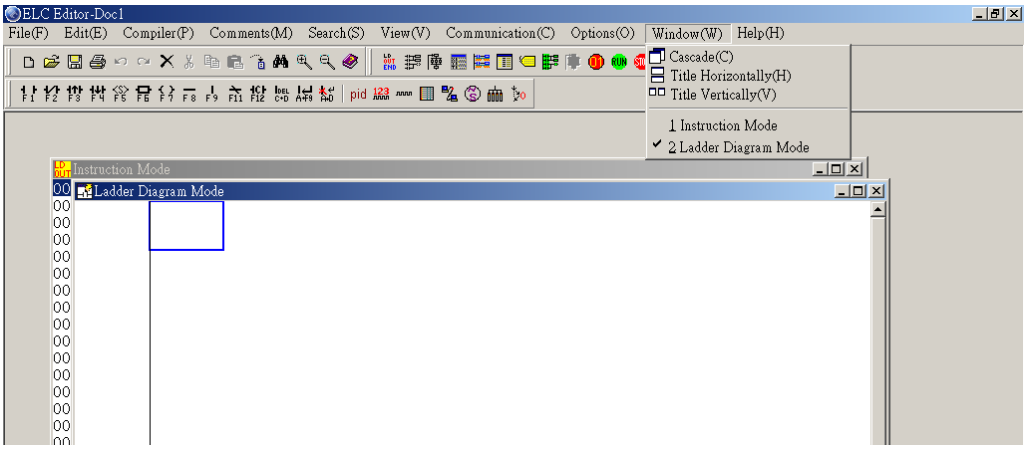
  ◈ Method: Click “Options” > “ Set ELC Date and Time(T)”

- Prompt to Edit Device Comment(H) ⇨ Once you enable this function, you will get the comment input dialog box when you edit ELC by entering instructions directly in the instruction mode or ladder diagram mode.

  ◈ Method: Click “Options” > “Prompt to Edit Device Comment(H)”

2.4 Window

The “Window” function is shown as follows:



- Cascade(C) ⇨ Arrange windows in an overlapping way.

  ◈ Method: Click “Window” > “Cascade(C)”

- Title Horizontally(H) ⇨ Arrange the file in a horizontal way.

  ◈ Method: Click “Window” > “Title Horizontally(H)

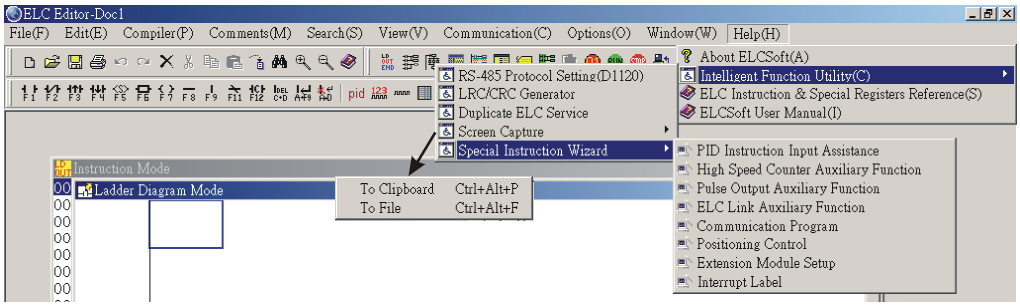
- Title Vertically(V)⇨ Arrange files in a vertical way.

  ◈ Method: Click “Window” > “Title Vertically(V)”

- The current files list ⇨ e.g. the Ladder Diagram Mode, the Instruction Mode, the SFC Edition, the Device Comment, the Device usage State, the Register State, the Device State Edition, the File Register and the Device Monitor.

2.5 Help

The “Help” function is shown as follows:



■ About ELCSoft(A) ⇨ Display ELCSoft relevant information, including EATON website and ELCSoft program version.

◈ Method: Click “Help” > “  About ELCSoft(A)”

■ Intelligent Function Utility(C) ⇨ The settings are RS-485 protocol setting (D1120), LRC/CRC generator, duplicate ELC service, screen capture and special instruction wizard.

◈ Method: Click “Help” > “  Intelligent Function Utility (C)”

▲ RS-485 Protocol Setting (D1120)

▲ LRC/CRC Generator

▲ Duplicate ELC Service

▲ Screen Capture

○ To Clipboard: Use keyboard shortcuts by pressing keys (Ctrl) + (Alt) + (P)

○ To File: Use keyboard shortcuts by pressing keys (Ctrl) + (Alt) + (F)

▲ Special Instruction Wizard

○ PID Instruction Input Assistance

○ High Speed Counter Auxiliary Function

○ Pulse Output Auxiliary Function

○ ELC Link Auxiliary Function

○ Communication Program

○ Position Control

○ Extension Module Setup

○ Interrupt Label

■ ELC Instruction & Special Registers Reference(S) ⇨ all instructions list and explanation, the manual for internal special auxiliary relay of all ELC series and the manual for internal special data register of all ELC series.

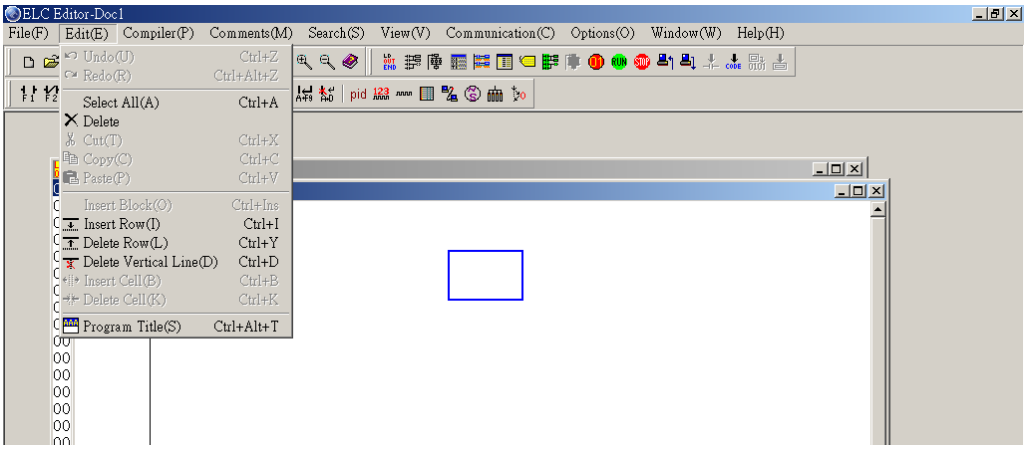
◈ Method: Click “Help” > “  ELC Instruction & Special Registers Reference (S)”

■ ELCSoft User Manual(I) ⇨ User Manual for ELCSoft

◈ Method: Click “Help” > “  ELCSoft User Manual(I)”

2.6 Edit

The “Edit” function is shown as follows:



- Undo(U) ⇨ undo the previous actions (max. is 10 times)
  - ◈ Method 1: Click “Edit” > “ Undo(U)”
  - ◈ Method 2: Click the icon on the toolbar
  - ◈ Method 3: Use keyboard shortcuts by pressing keys (Ctrl) + (Z)
  - ◈ Method 4: Right-click to get pop-up menu and select “undo” in the pop-up menu
- Redo(R) ⇨ redo the previous actions.
  - ◈ Method 1: Click “Edit” > “ Redo(R)”
  - ◈ Method 2: Click the icon on the toolbar
  - ◈ Method 3: Use keyboard shortcuts by pressing keys (Ctrl) + (Alt) + (Z)
  - ◈ Method 4: Right-click to get pop-up menu and select “redo” in the pop-up menu
- Select All(A) ⇨ select entire document and marked with inverse
  - ◈ Method 1: Click “Edit” > “Select All (A)”
  - ◈ Method 2: Use keyboard shortcuts by pressing keys (Ctrl) + (A)

- Delete ⇨ delete marked block or the words where the cursor is.
  - ◈ Method 1: Click “Edit” > “ Delete”
  - ◈ Method 2: Click the icon on the toolbar
  - ◈ Method 3: Use keyboard shortcuts by pressing key (Delete)
  - ◈ Method 4: Right-click to get pop-up menu and select “delete” in the pop-up menu
- Cut(T) ⇨ cut down those words that are selected
  - ◈ Method 1: Click “Edit” > “ Cut(T)”
  - ◈ Method 2: Click the icon on the toolbar
  - ◈ Method 3: Use keyboard shortcuts by pressing keys (Ctrl) + (X)
  - ◈ Method 4: Right-click to get pop-up menu and select “Cut” in the pop-up menu
- Copy(C) ⇨ copy those words that are selected
  - ◈ Method 1: Click “Edit” > “ Copy(C)”
  - ◈ Method 2: Click the icon on the toolbar
  - ◈ Method 3: Use keyboard shortcuts by pressing keys (Ctrl) + (C)
  - ◈ Method 4: Right-click to get pop-up menu and select “Copy” in the pop-up menu
- Paste(P) ⇨ Paste those words that are selected on the document
  - ◈ Method 1: Click “Edit” > “ Paste(P)”
  - ◈ Method 2: Click the icon on the toolbar
  - ◈ Method 3: Use keyboard shortcuts by pressing keys (Ctrl) + (V)
  - ◈ Method 4: Right-click to get pop-up menu and select “Paste” in the pop-up menu
- Insert Block(O) ⇨ insert those words that are selected (only for ladder diagram mode)
  - ◈ Method 1: Click “Edit” > “Insert Bock (O)”
  - ◈ Method 2: Use keyboard shortcuts by pressing keys (Ctrl) + (Ins)
  - ◈ Method 3: Right-click to get pop-up menu and select “Insert a block” in the pop-up menu

- Insert Row(I) ⇨ insert a line into the document
  - ◈ Method 1: Click “Edit” > “  Insert Row(I)”
  - ◈ Method 2: Use keyboard shortcuts by pressing keys (Ctrl) + (I)
  - ◈ Method 3: Right-click to get pop-up menu and select “Insert Row” in the pop-up menu
- DeleteRow(L) ⇨ delete a line from the document
  - ◈ Method 1: Click “Edit” > “  Delete Row(L)”
  - ◈ Method 2: Use keyboard shortcuts by pressing keys (Ctrl) + (Y)
  - ◈ Method 3: Right-click to get pop-up menu and select “Delete Row” in the pop-up menu
- Delete Vertical Line(D) ⇨ delete the vertical lines from the document (only for ladder diagram mode)
  - ◈ Method 1: Click “Edit” > “  Delete Vertical Line (D)”
  - ◈ Method 2: Click the icon  on the toolbar
  - ◈ Method 3: Use keyboard shortcuts by pressing keys (Ctrl) + (D)
  - ◈ Method 4: Right-click to get pop-up menu and select “Delete Vertical Line” in the pop-up menu
- Insert Cell(B) ⇨ Insert a cell on the right side in SFC edition page. (Only for SFC mode)
  - ◈ Method 1: Click “Edit” > “  Insert Cell(B)”
  - ◈ Method 2: Use keyboard shortcuts by pressing keys (Ctrl) + (B)
  - ◈ Method 3: Right-click to get pop-up menu and select “Insert Cell” in the pop-up menu
- Delete Cell(K) ⇨delete a cell at the left side in SFC page (Only for SFC mode)
  - ◈ Method 1: Click “Edit” > “  Delete Cell(K)”
  - ◈ Method 2: Use keyboard shortcuts by pressing keys (Ctrl) + (K)
  - ◈ Method 3: Right-click to get pop-up menu and select “Delete Cell” in the pop-up menu

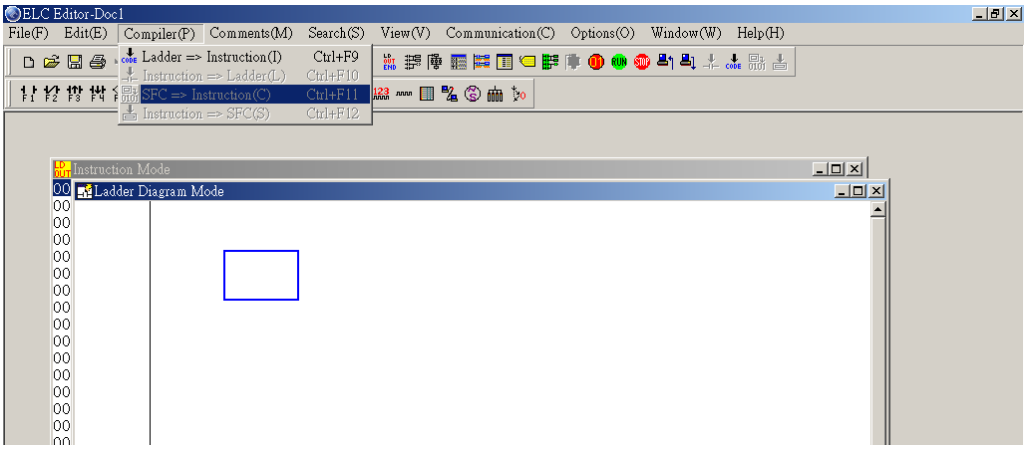
■ Program Title ⇨ the information of program title, file name, company name and designer are shown here. This information can be printed as easy cover.

◈ Method 1: Click “Edit” > “ Program Title (S)”.

◈ Method 2: Use keyboard shortcuts by pressing keys (Ctrl) + (Alt) + (T).

2.7 Compiler

The “Compiler” function is shown as follows:



■ Ladder => Instruction(I) ⇨ Convert ladder diagram to instruction

◈ Method 1: Click “Compiler” > “ Ladder => Instruction(I)”

◈ Method 2: Click the icon on the toolbar

◈ Method 3: Use keyboard shortcuts by pressing keys (Ctrl) + (F9)

■ Instruction => Ladder(L) ⇨ Convert instruction to ladder diagram

◈ Method 1: Click “Compiler” > ” Instruction => Ladder(L)”

◈ Method 2: Click the icon on the toolbar

◈ Method 3: Use keyboard shortcuts by pressing keys (Ctrl) + (F10)

■ SFC=> Instruction(C) ⇨ Convert SFC diagram to instruction (Before converting SFC diagram to ladder diagram, it needs to convert SFC diagram to instruction first.)

◈ Method 1: Click “Compiler” > ” SFC=> Instruction (C)”

◈ Method 2: Click the icon on the toolbar

◈ Method 3: Use keyboard shortcuts by pressing keys (Ctrl) + (F11)

■ Instruction =>SFC (S) ⇨ Convert instruction to SFC diagram

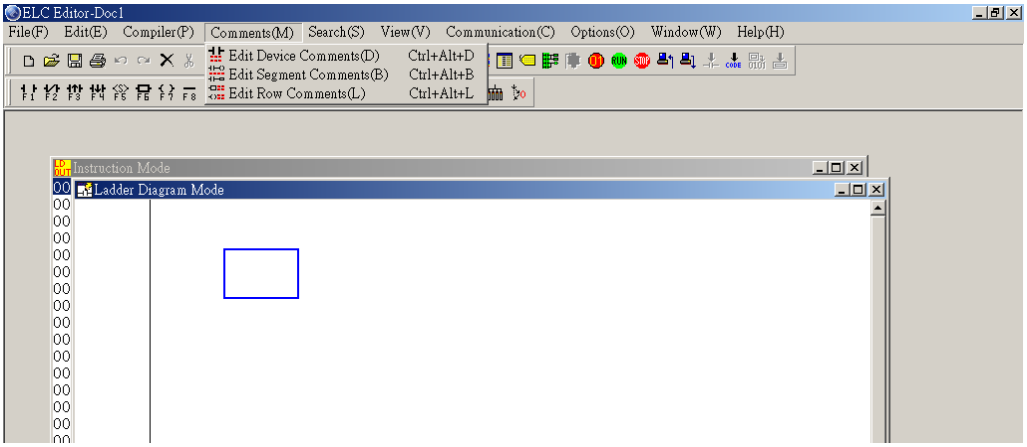
◈ Method 1: Click “Compiler” > ”  Instruction =>SFC (S)”

◈ Method 2: Click the icon  on the toolbar

◈ Method 3: Use keyboard shortcuts by pressing keys (Ctrl) + (F12)

2.8 Comments

The “Comments” function is shown as follows:



■ Edit Device Comments(D) ⇨ you can have comment for device while cursor is on the instruction with operand.

◈ Method 1: Click “Comment” > ” Edit Device comments(D)”.

◈ Method 2: Use keyboard shortcuts by pressing keys (Ctrl) + (Alt) + (D).

◈ Method 3: Right-click to get pop-up menu and select “Edit Device comments” in the pop-up menu.

■ Edit Segment Comments ⇨ you can have segment comment in the blank row. (Only for ladder diagram mode)

◈ Method 1: Click Comment > ” Edit Segment Comments (B) ”.

◈ Method 2: Use keyboard shortcuts by pressing keys (Ctrl) + (Alt) + (B).

◈ Method 3: Right-click to get pop-up menu and select “Edit Segment Comments” in the pop-up menu.

■ Edit Row comments ⇨ you can have row comment after output coil or instruction of each row (Only for ladder diagram mode)

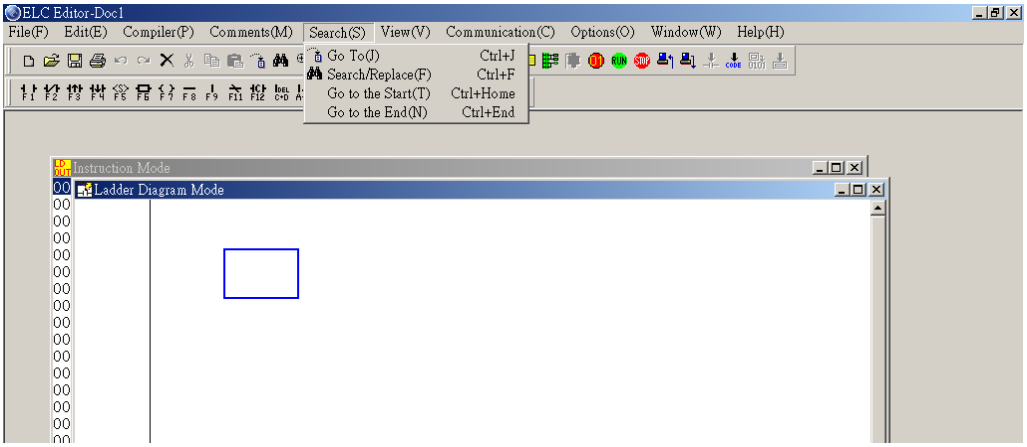
◈ Method 1: Click “Comment” > ” Edit Row comments(L)”.

◈ Method 2: Use keyboard shortcuts by pressing keys (Ctrl) + (Alt) + (L).

◈ Method 3: Right-click to get pop-up menu and select “Edit Row comments” in the pop-up menu.

2.9 Search

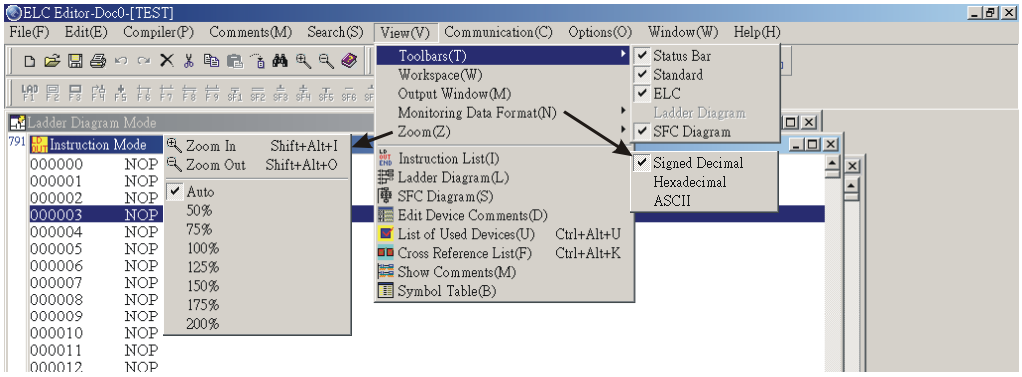
The “Search” function is shown as follows:



- Go to(J) ⇨ used to jump to designated location (unit: Step)
  - ◈ Method 1: Click “Search” > ” Go to(J)”
  - ◈ Method 2: Click the icon on the toolbar
  - ◈ Method 3: Use keyboard shortcuts by pressing keys (Ctrl) + (J)
- Search/Replace(F) ⇨ search or replace designated device name and instruction
  - ◈ Method 1: Click “Search” > ” Search/Replace(F)”
  - ◈ Method 2: Click the icon on the toolbar
  - ◈ Method 3: Use keyboard shortcuts by pressing keys (Ctrl) + (F)
- Go to the Start(T) ⇨ jump to program start
  - ◈ Method 1: Click “Search” > ” Go to the Start (T)”
  - ◈ Method 2: Use keyboard shortcuts by pressing keys (Ctrl) + (Home)
- Go to the End(N) ⇨ jump to the end of program
  - ◈ Method 1: Click “Search” > ” Go to the End (N)”
  - ◈ Method 2: Use keyboard shortcuts by pressing keys (Ctrl) + (End)

2.10 View

The “View” function is shown as follows:



■ Toolbars ⇨ tools of status bar, standard, ELC, Ladder diagram and SFC diagram is included.

▲ Status bar: display or hide status bar.

◈ Method: Click “View” > “Toolbars(T)” > “Status bar“

▲ Standard: display or hide standard tools.

◈ Method: Click “View” > “Toolbars(T)” > “Standard”

▲ ELC: display or hide ELCSoft toolbar.

◈ Method: Click “View” > “Toolbars(T)” > “ELC”

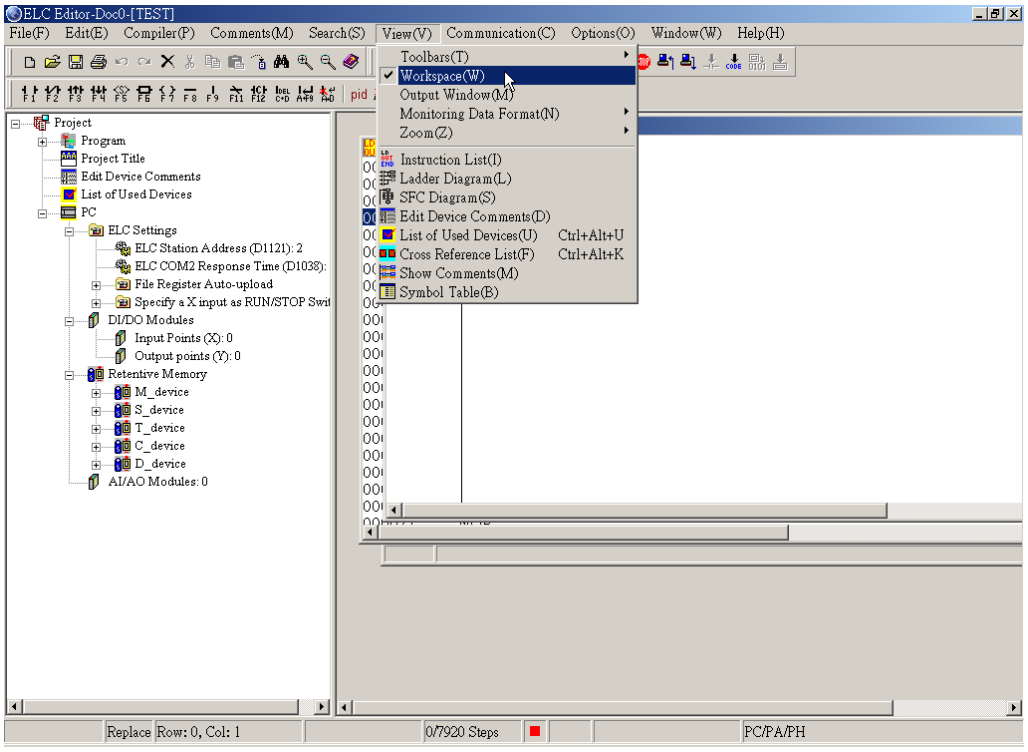
▲ Ladder diagram: display or hide ladder diagram toolbar. (Only for ladder diagram mode)

◈ Method: Click “View” > “Toolbars(T)” > “Ladder diagram”

▲ SFC diagram: display or hide SFC diagram toolbar. (Only for SFC diagram mode)

◈ Method: Click “View” > “Toolbars(T)” > “SFC diagram”

■ Workspace(W) ⇨ display or hide project work area. You can click related windows and detect or set communication.



◈ Method: Click “View” > “Workspace(W)”

■ Output Window(M) ⇨ display or hide output window. The error message after executing compiler, grammar check and SFC compile will be shown in output window.

◈ Method: Click “View” > “Output Window(M)”

■ Monitoring Data Format(N) ⇨ convert the register content to different number system in ladder monitor mode. The number system can be signed decimal, hexadecimal and ASCII in ladder monitor mode and device monitor mode. Moreover, number system can be unsigned decimal, BCD or binary when right-click in device monitor mode.

◈ Method: Click “View” > “Monitoring Data Format (N)”

■ Zoom(Z) ⇨ you can zoom in  or zoom out  the window and the settings can be 50 %, 75 %, 100 %, 125 %, 150 %, 175 % and 200 %.

◈ Method 1: Click “View” > “Zoom (Z)”

◈ Method 2: Use keyboard shortcuts by pressing keys (Shift) + (Alt) + (I) or click the icon  on the toolbar to zoom in.

◈ Method 3: Use keyboard shortcuts by pressing keys (Shift) + (Alt) + (O) or click the icon  on the toolbar to zoom in.

■ Instruction List(I) ⇨ change to instruction mode

◈ Method 1: Click “View” > “  Instruction List(I)”

◈ Method 2: Click the icon  on the toolbar

◈ Method 3: Double click instruction list in project tree diagram. (You can get a project tree diagram after clicking view > workspace.)

■ Ladder Diagram(L) ⇨ change to ladder diagram mode

◈ Method 1: Click “View” > “  Ladder Diagram(L)”

◈ Method 2: Click the icon  on the toolbar

◈ Method 3: Double click Ladder Diagram in project tree diagram. (You can get a project tree diagram after clicking view > workspace.)

■ SFC Diagram(S) ⇨ change to SFC diagram mode

◈ Method 1: Click “View” > “  SFC Diagram(S)”

◈ Method 2: Click the icon  on the toolbar

◈ Method 3: Double click SFC Diagram in project tree diagram. (You can get a project tree diagram after clicking view > workspace.)

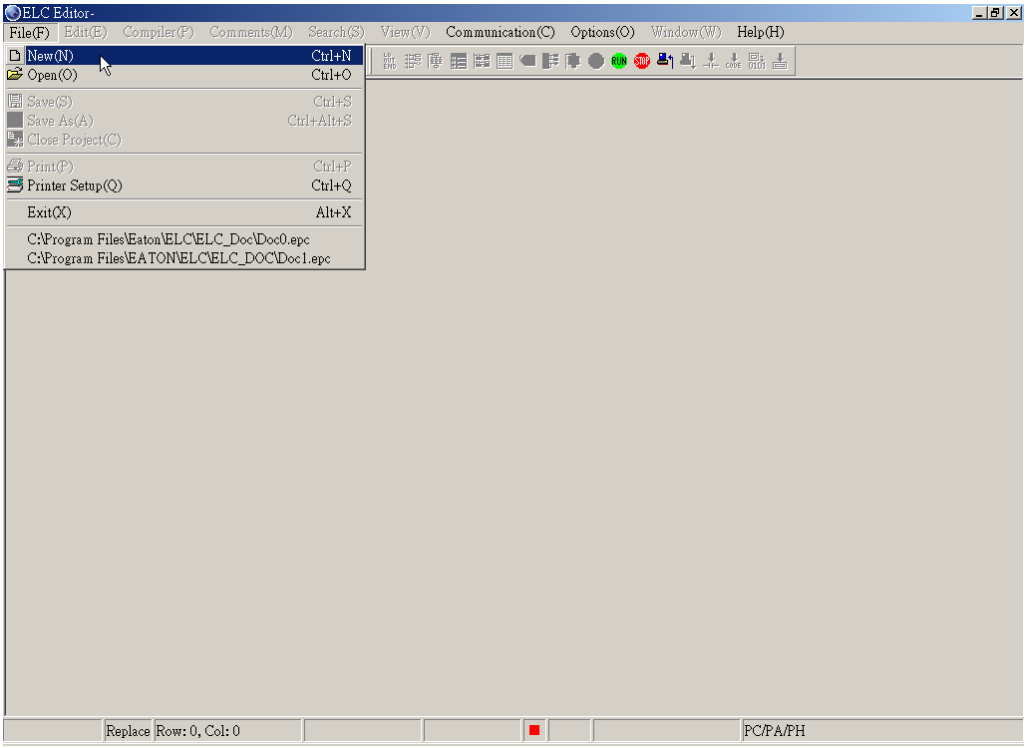
- Edit Device Comments(D) ⇨ display all device comments (you can edit all device comments in this window)
  - ◈ Method 1: Click “View” > “  Edit Device Comments(D)”
  - ◈ Method 2: Click the icon  on the toolbar
  - ◈ Method 3: Double click Edit Device Comments in project tree diagram. (You can get a project tree diagram after clicking view > workspace.)
- List of Used Device(U) ⇨ display all device usage status
  - ◈ Method 1: Click “View” > “  List of Used Device(U)”
  - ◈ Method 2: Use keyboard shortcuts by pressing keys (Ctrl)+ (Alt) + (U)
  - ◈ Method 3: Double click Edit Device Comments in project tree diagram. (You can get a project tree diagram after clicking view > workspace.)
- Cross Reference List(F) ⇨ check the repeated use of the basic instructions OUT, SET, RST, TMR, CNT, DCNT, PLS and PLF.
  - ◈ Method 1: Click “View” > “  Cross Reference List(F)”
  - ◈ Method 2: Use keyboard shortcuts by pressing keys (Ctrl) + (Alt) + (K)
- Show Comments(M) ⇨ display or hide device comments.
  - ◈ Method 1: Click “View” > “  Show Comments(M)”
  - ◈ Method 2: Click the icon  on the toolbar
- Symbol Table(B) ⇨ display Symbol Table.
  - ◈ Method 1: Click “View” > “  Symbol Table(B)”
  - ◈ Method 2: Click the icon  on the toolbar

3.1 Creating Documents

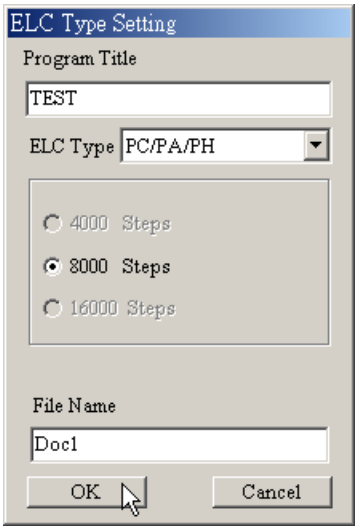
ELCSoft lets users create a blank document by clicking the icon  on toolbar or clicking "File" > "New(N)". The methods of creating a new file are listed as follows:

◈ Method 1: Click "File" > "New(N)"

a. Click "File" > "New(N)" to create a blank document.



b. Then, the dialog box of "ELC Type Setting" will pop up and you can set program title, ELC type, program capacity and file name.

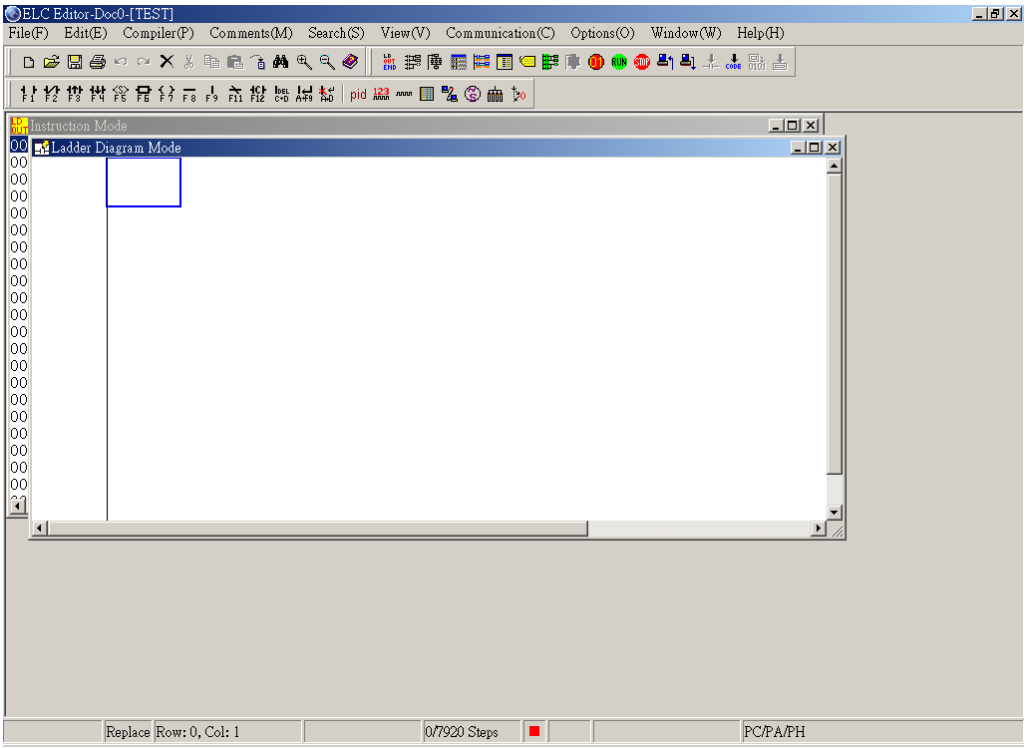


c. You can design a new program and set ELC type via this dialog box. After ELC type is determined, ELCSoft will select the available program capacity (Steps) automatically.

d. The program title is used to record the basic functions explanation of the program. For example, if all control functions edited in this program are concerned with Inverters, it is thus named as “TEST”.

e. By default in ELCSoft, created documents are all saved to the file name extension as “* .epc” and the first filename of a new document will be named as ” doc0.epc”. (When creating a new document, ELCSoft will check automatically whether there is an existing filename named as doc0.epc in the folder. If this “doc0.epc“ filename already existed, ELCSoft will save the document to doc1.epc, the next number follows the pre-set filename, and so forth).

The following figure is the window when a new file is created:



◈ Method 2: Click the icon  on toolbar to create a new blank document.

◈ Method 3: Use keyboard shortcuts by pressing keys (Ctrl) + (N) to create a new blank document.

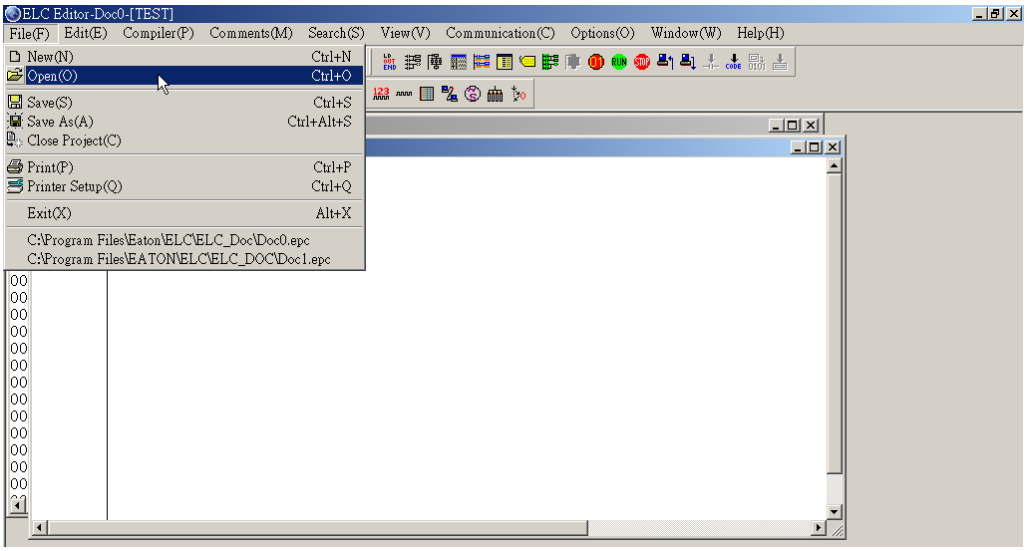
3.2 Opening Documents

ELCSoft utilizes the project-by-project conducts. Thus, users can only open one document at a time. Users can select an old file that users want to open in the “Open” dialog box. If users want to edit two ELC programs at the same time, simply execute the ELCSoft editor twice, and then user can conduct functions such as editing, copying, cutting and pasting in two ELC programs simultaneously.

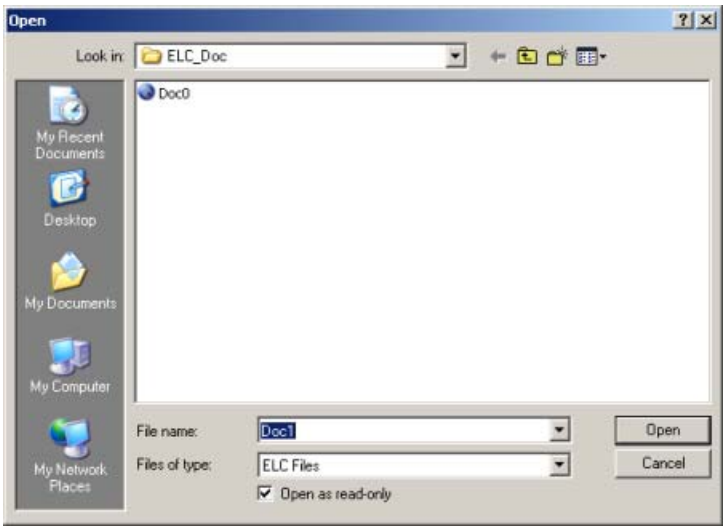
ELCSoft lets users open an old file by clicking the icon  on toolbar or clicking “File” > “Open(O)”. The methods of opening an old file are listed as follows:

◈ Method 1: Click “File” > “Open(O)”

a. Click “File” > “Open(O)” to open an old document stored on your hard disk.



b. The “Open(O)” Dialog Box:



You can open a document you want that stored on your hard disk in the following ways:

- Look in ⇨ Locate the hard disk and the folder where the “*.epc” file you want is stored.
- File name ⇨ Type or select the filename you want in the File name box. From this dialog box, you can see all files with different file names which the file name extension is “*.epc”.
- Files of type ⇨ Select the file format you want in the Files of type box; for example, type *.epc to find ELC files.

◈ Method 2: To quickly open an existing document, click the icon on toolbar.

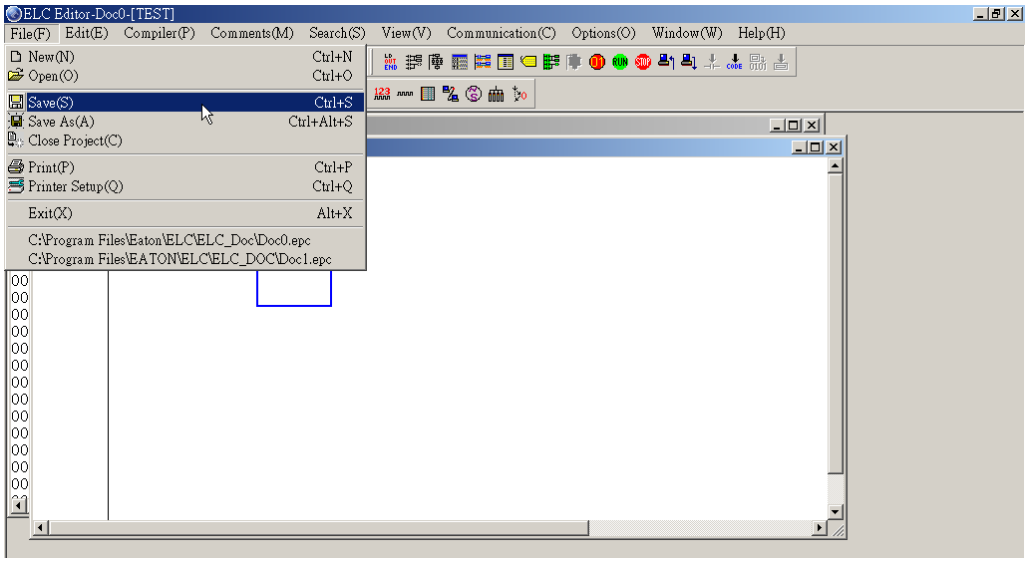
◈ Method 3: To quickly open an existing document, use keyboard shortcuts by pressing keys (Ctrl) + (N).

Up to five old files can be stored in ELCSoft, therefore, users can double-click the filename directly and open it.

3.3 Saving Documents

ELCSoft lets users save editing file by clicking the icon on toolbar or clicking “File” > “Save(S)”. The editing file can be saved by its original filename in the current folder. The methods of saving a file are listed as follows:

◈ Method 1: Click “File” > “Save(S)”



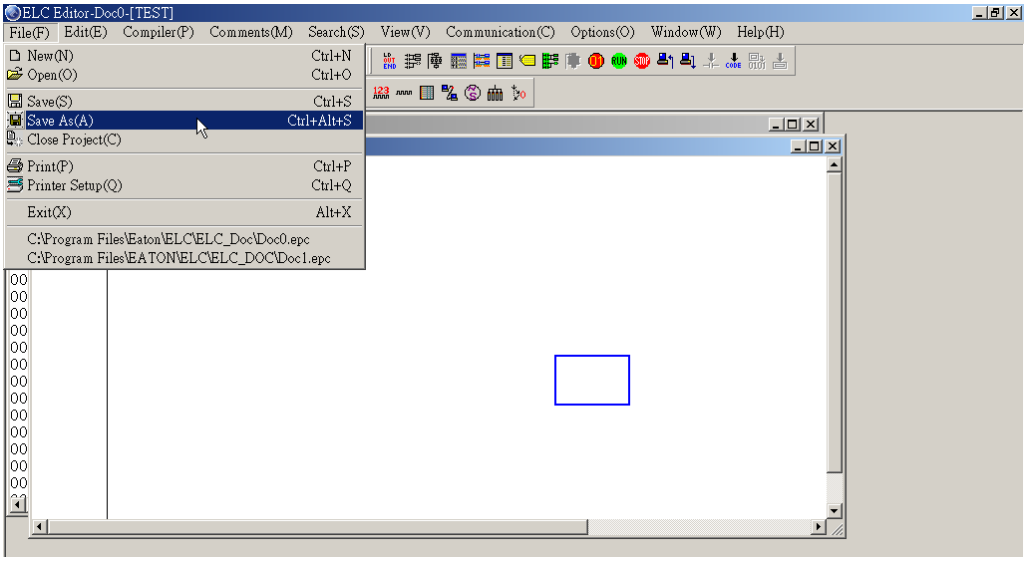
◈ Method 2: To quickly save a document, click the icon  on toolbar.

◈ Method 3: To quickly save a document, use keyboard shortcuts by pressing keys (Ctrl) + (S).

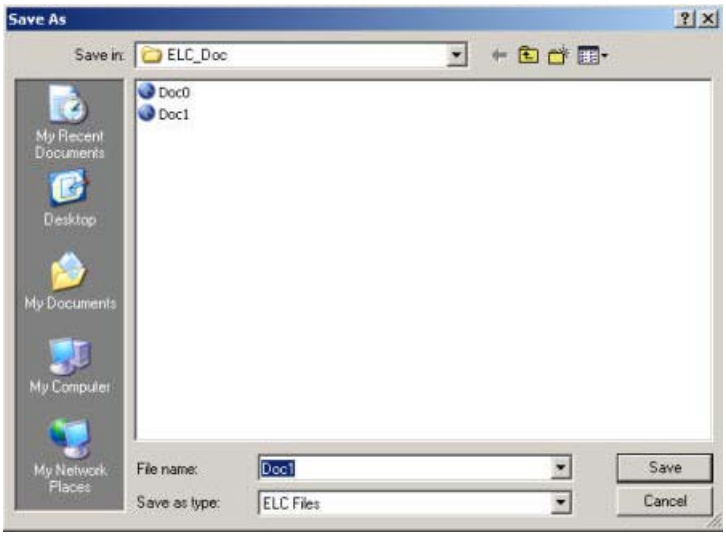
3.4 Saving Copies of Documents

ELCSoft lets users save a copy of a document by clicking “Save as(A)” on the File menu. The editing program can be saved on the hard disk as a different name. If this is the first time you have saved the document, ELCSoft will save the document by using a default filename. Before saving a document, if you want to change the filename of the document or save the document in different folder, click “Save as(A)”. The methods of saving a copy of a document are listed as follows:

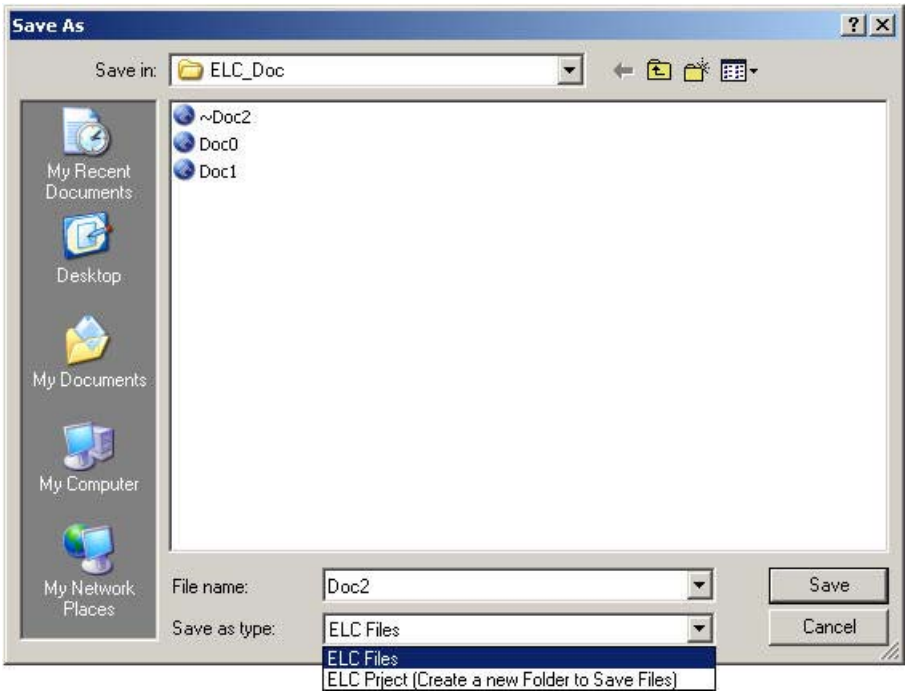
◈ Method 1: Click “File” > “Save as(A)”



Type a new name for the document and click the button “Save”.



If you select "save as" and ELC file type, it will store all the generated files into designated folder. You can also select "save as" and "ECL project type", it will generate a new folder that named with file name and store all generated files into new folder.



◈ Method 2: To quickly save a copy of a document, use keyboard shortcuts by pressing keys (Ctrl) + (Alt) + (S).

3.5 Printing

When the programs are completed, ELCSoft provides extensive options for printing your work. In the ELCSoft, you can click the icon on toolbar or choose “Print(P)” command from the “File” menu to print the data in the currently-active window. Therefore, if you click the icon on toolbar or choose “Print(P)” command from the “File” menu when the ladder diagram edit window is active, the ladder diagram will be printed. ELCSoft allows users to print: ladder diagrams, SFC diagrams, instructions, editing register devices and device comments. Please refer to the following for more introductions on Printing function.

■ Printing Ladder Diagrams

In ladder diagrams mode (when the ladder diagram edit window is active), click the icon on toolbar or choose “Print(P)” command from the “File” menu. The printing dialog box will pop up and then users can select printing options to print the ladder diagrams. Users can choose to print all or partial document in the selection box and decide the printing

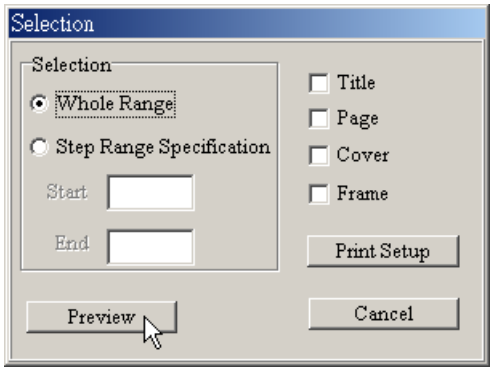
range that users specify (Start and End). Also, users can determine if the title, page numbers and cover are printed out or not. Clicking “Preview” button can check how the document is going to look before printing it. Clicking “Printer setup” button can setup the printer and the layout of the whole document.
If the printed out data is the same as displayed result, it indicates that the comments can also be printed out if there are comments displayed on the ladder diagrams.

■ Printing SFC Diagrams

In SFC mode (when the SFC diagram edit window is active), click the icon  on toolbar or choose “Print(P)” command from the “File” menu to print the SFC diagrams. When the printing dialog box pops up and then users can select printing options to print the SFC diagrams. Users can choose to print all or partial document in the selection box and decide the printing range that users specify (Start and End). Also, users can determine if the title, page numbers and cover are printed out or not. Clicking “Preview” button can check how the document is going to look before printing it. Clicking “Printer setup” button can setup the printer and the layout of the whole document.

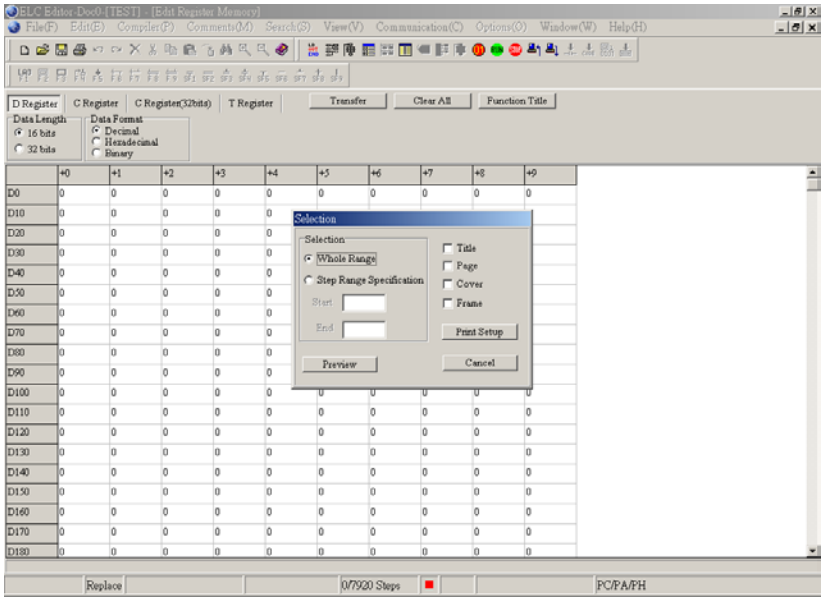
■ Printing Instructions

In the instructions mode (when the instruction mode window is activate), click the icon on toolbar or choose “Print” command from the “File” menu. The printing dialog box will pop up and then users can select printing options to print the instructions. Users can choose to print all or partial document in the selection box and decide the printing range that users specify (Start and End). Also, users can determine if the title, page numbers and cover are printed out or not. Clicking “Preview” button can check how the document is going to look before printing it. Clicking “Printer setup” button can setup the printer and the layout of the whole document.



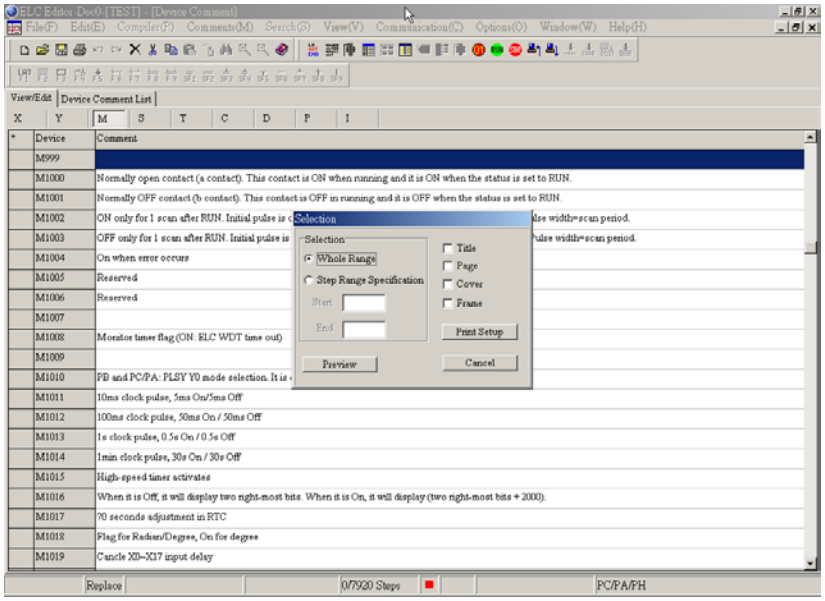
■ Printing Editing Registers (T, C, D) and Bit Memory (M, S)

When the registers or devices editing windows is activate, click the icon  on toolbar or choose “Print” command from the “File” menu. The printing dialog box will pop up and then users can select printing options to print the editing registers or devices. Users can choose to print all or partial document in the selection box and decide the printing range that users specify (Start and End). Also, users can determine if the title, page numbers and cover are printed out or not. Clicking “Preview” button can check how the document is going to look before printing it. Clicking “Printer setup” button can setup the printer and the layout of the whole document.



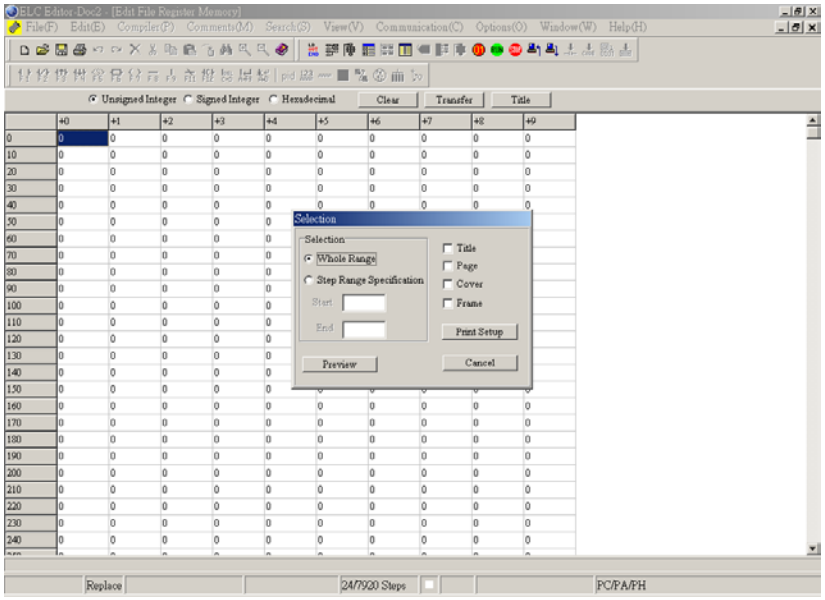
■ Printing Device Comments

When the device comments editing window is activate, click the icon  on toolbar or choose “Print” command from the “File” menu. The printing dialog box will pop up and then users can select printing options to print the device comments. Users can choose to print all or partial document in the selection box and decide the printing range that users specify (Start and End). Also, users can determine if the title, page numbers and cover are printed out or not. Clicking “Preview” button can check how the document is going to look before printing it. Clicking “Printer setup” button can setup the printer and the layout of the whole document.



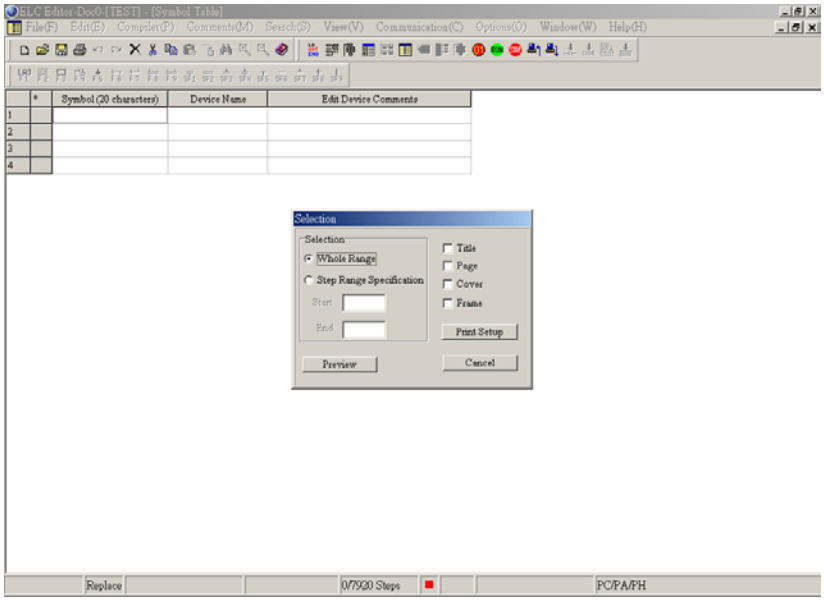
■ Printing Editing File Registers Memory

When the File Registers Memory editing windows is activate, click the icon  on toolbar or choose “Print” command from the “File” menu. The printing dialog box will pop up and then users can select printing options to print the editing registers or devices. Users can choose to print all or partial document in the selection box and decide the printing range that users specify (Start and End). Also, users can determine if the title, page numbers and cover are printed out or not. Clicking “Preview” button can check how the document is going to look before printing it. Clicking “Printer setup” button can setup the printer and the layout of the whole document.



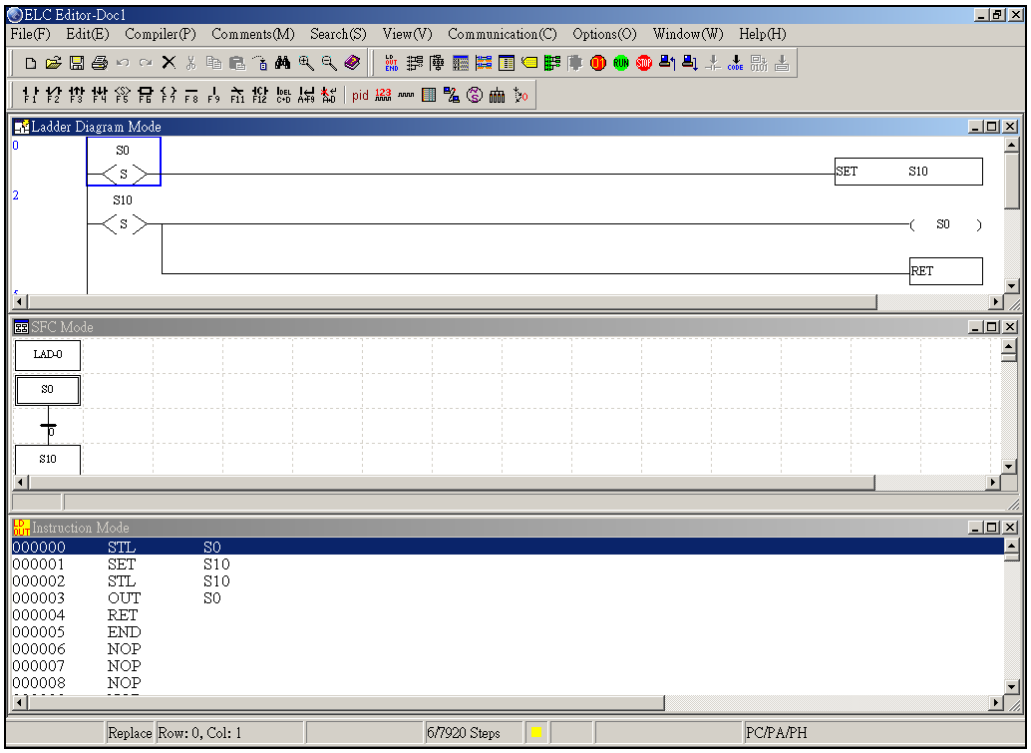
■ Printing Symbol table

When the Symbol table editing window is activate, click the icon  on toolbar or choose “Print” command from the “File” menu. The printing dialog box will pop up and then users can select printing options to print the device comments. Users can choose to print all or partial document in the selection box and decide the printing range that users specify (Start and End). Also, users can determine if the title, page numbers and cover are printed out or not. Clicking “Preview” button can check how the document is going to look before printing it. Clicking “Printer setup” button can setup the printer and the layout of the whole document.



4.1 Editing Environment

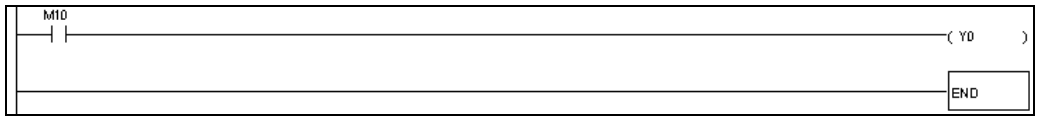
Start up ELCSoft, and click “New” to create a new screen or click “Open” to open an old file. Then, users can enter into the editing environment of ladder diagram mode and use ladder diagrams to create ELC programs as shown as the figure below.



There is a ladder diagram toolbar shown on the top of the ladder diagram mode window. To create and edit a ladder diagram, you can click the icon on toolbar directly by mouse or move the editing block to the proper position and enter instructions. Besides, you also can press the F1 ~ F12 function keys on the keyboard to create and edit the ladder diagram. Please refer to the following sections for how to create and edit ladder diagram.

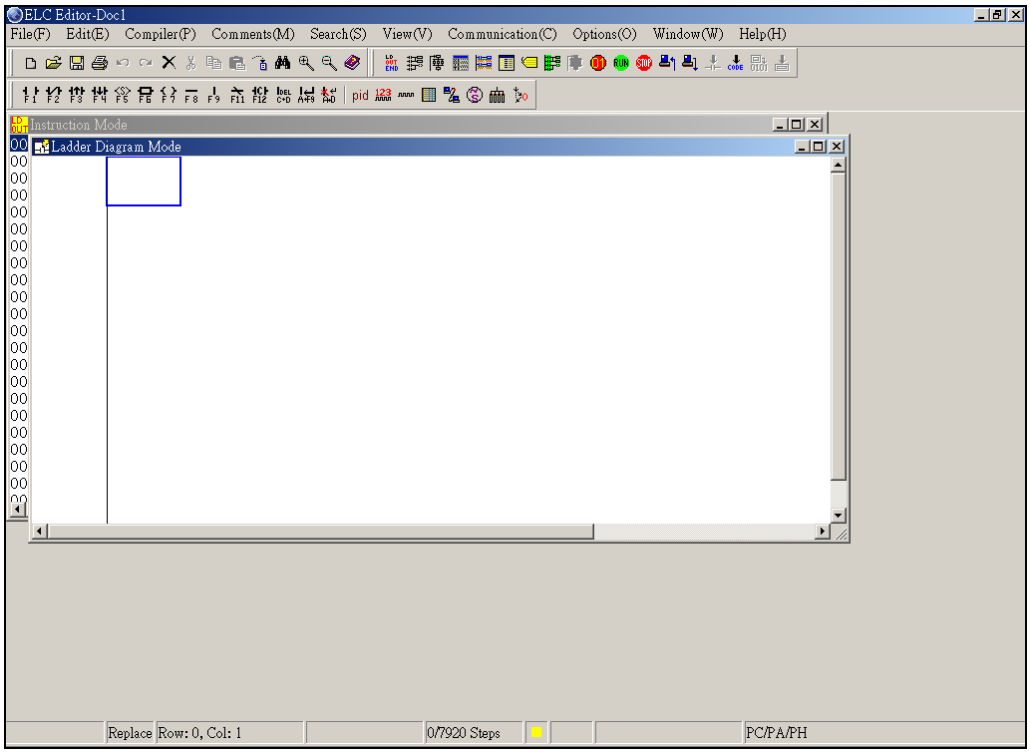
4.2 Basic Operation

Example: Create the diagram shown below

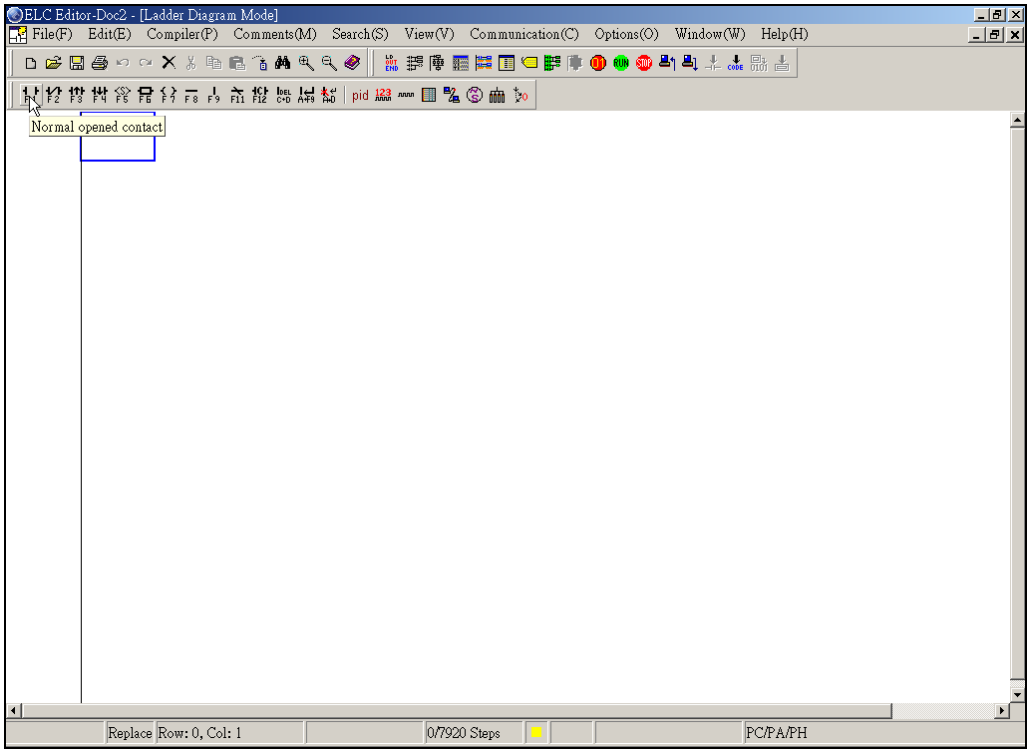


■ Using Mouse and F1 ~ F12 function keys on the keyboard.

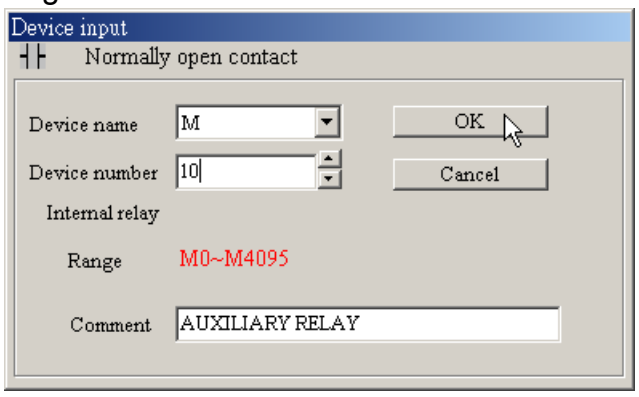
1. Click “File” > “New” (refer to section 3.1) to create a new document, and enter the ladder diagram mode shown below.



2. Click the Normally Open Contact icon  on toolbar or press F1 function key.



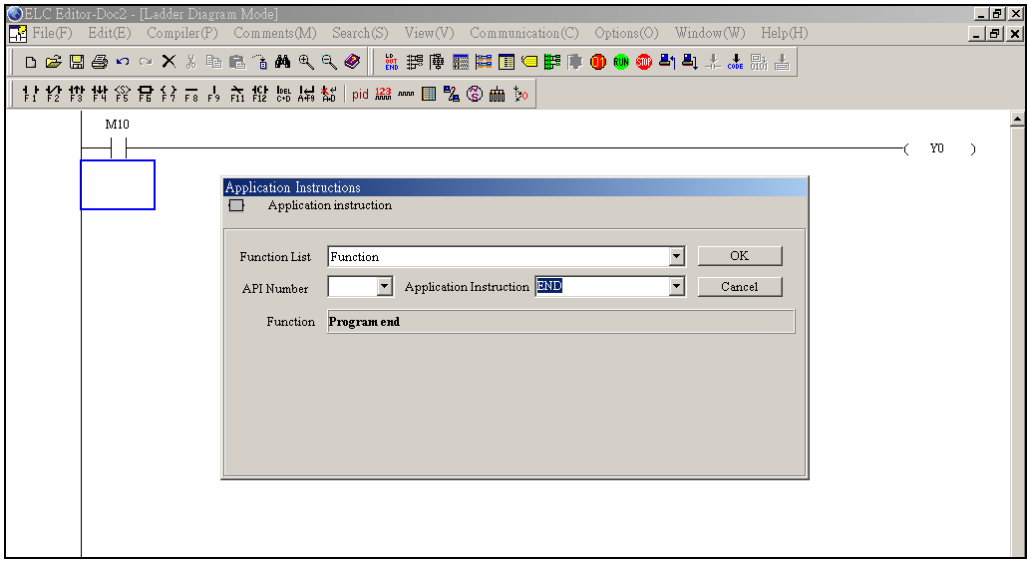
3. The “Device Input” dialog box will appear. You can select device name (e.g. M) and number (e.g. 10), and enter comments (e.g. Internal Relay). Then, press the button “OK” to save the setting.



4. Click the Output Coil icon  on toolbar or press F7 function key. The “Device Input” dialog box will appear. You can select device name (e.g. Y) and number (e.g. 0), and enter comments (e.g. Output Coil). Then, press the button “OK” to save the setting.

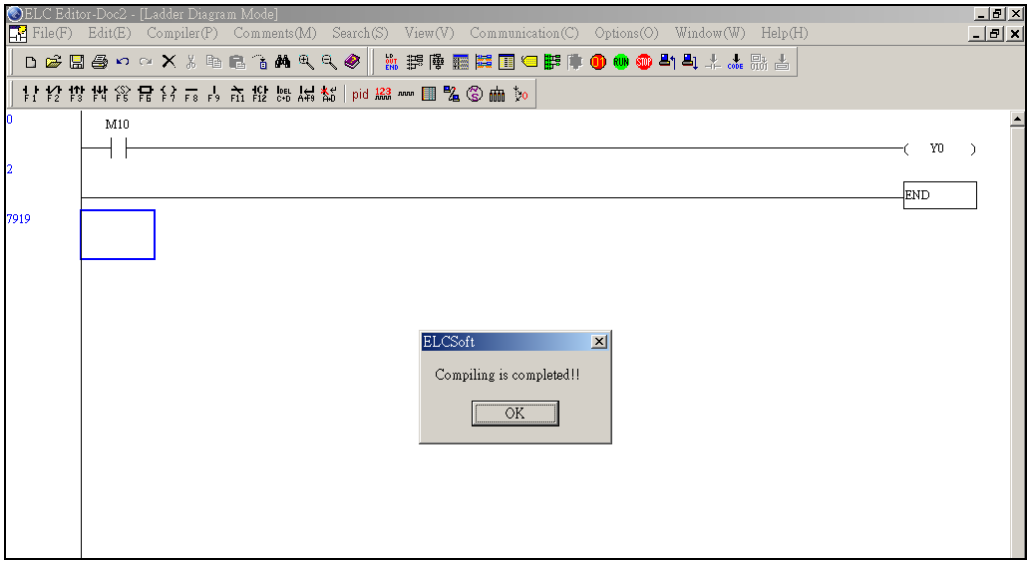
5. Click Application Instruction icon 

or press F6 function key. Choose “Functions” in the Function List box and select “END” instruction from the pull-down menu or type the “END” instruction in the Application Instruction list box. Then, press the button “OK” to save the setting.

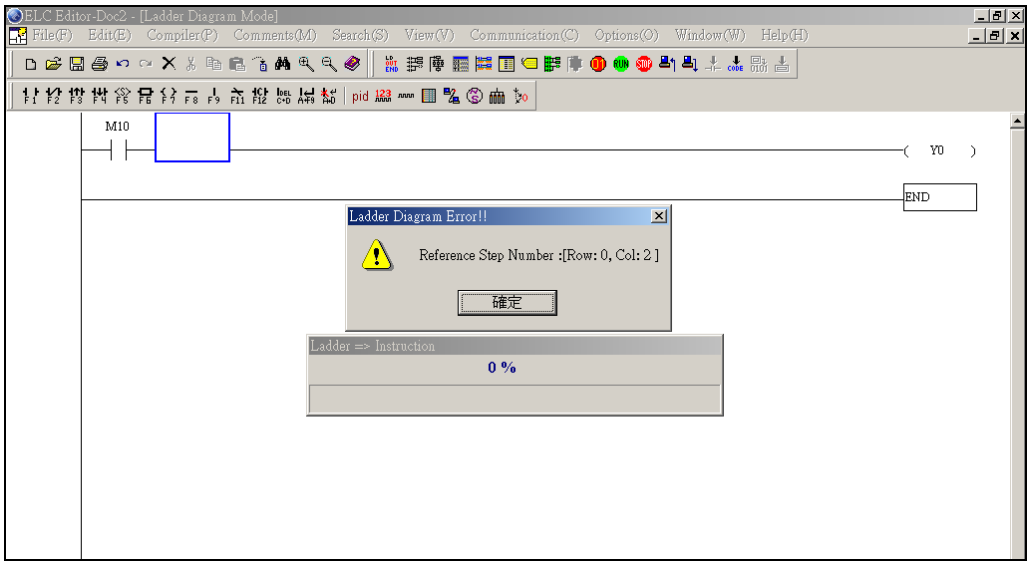


6. Click the icon 

to compiler ladder diagram and convert the ladder diagram to instruction. After compiler action is completed, the numbers of steps will show on the left-hand side of the start of the ladder diagram.

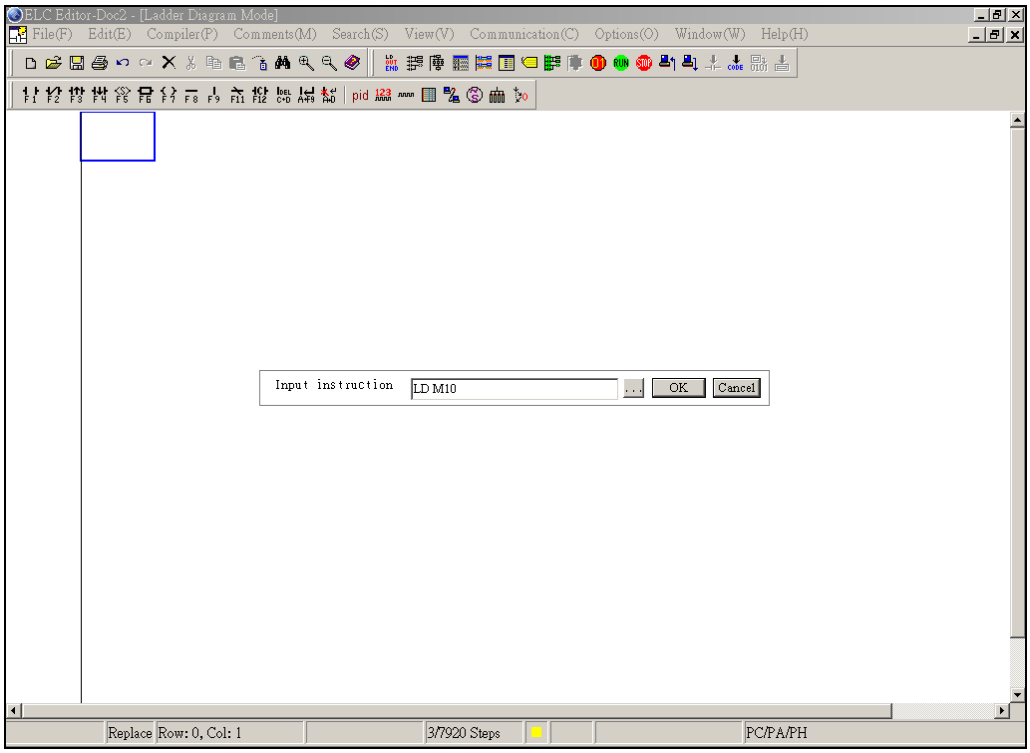


7. If the ladder diagram is not correct, a Ladder Diagram Error message dialog box will appear and point out the exact erroneous rows and addresses after the compiler action is completed.



■ Keyboard Operation

1. Place the editing block at the start of the document, and type LD M10 (or A M10) by using the keyboard. Then, press the Enter key on the keyboard, or click the button “OK” to complete the setting.

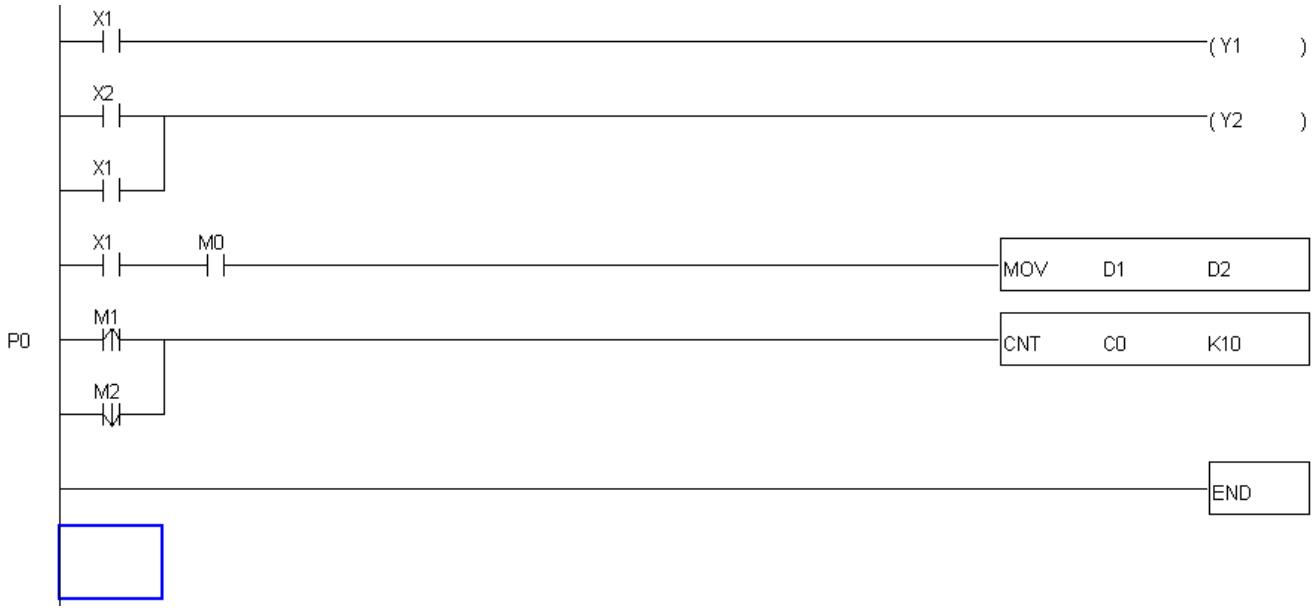


2. Type OUT Y0 (or O Y0) and press Enter key on the keyboard. Then, type END and press Enter key on the keyboard. Finally, click the icon CODE to compiler the completed ladder diagram.

If you want to edit the comments at the same time when input an instruction by using keyboard, you can click the “Prompt to Edit Device Comment(H)” under the “Options” menu. Then, the “Comment” dialog box (see the figure below) will appear for you to enter and edit the corresponding comments after an instruction is input correctly.

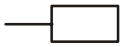
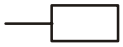
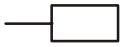
4.3 Editing Example

■ Ladder Diagram

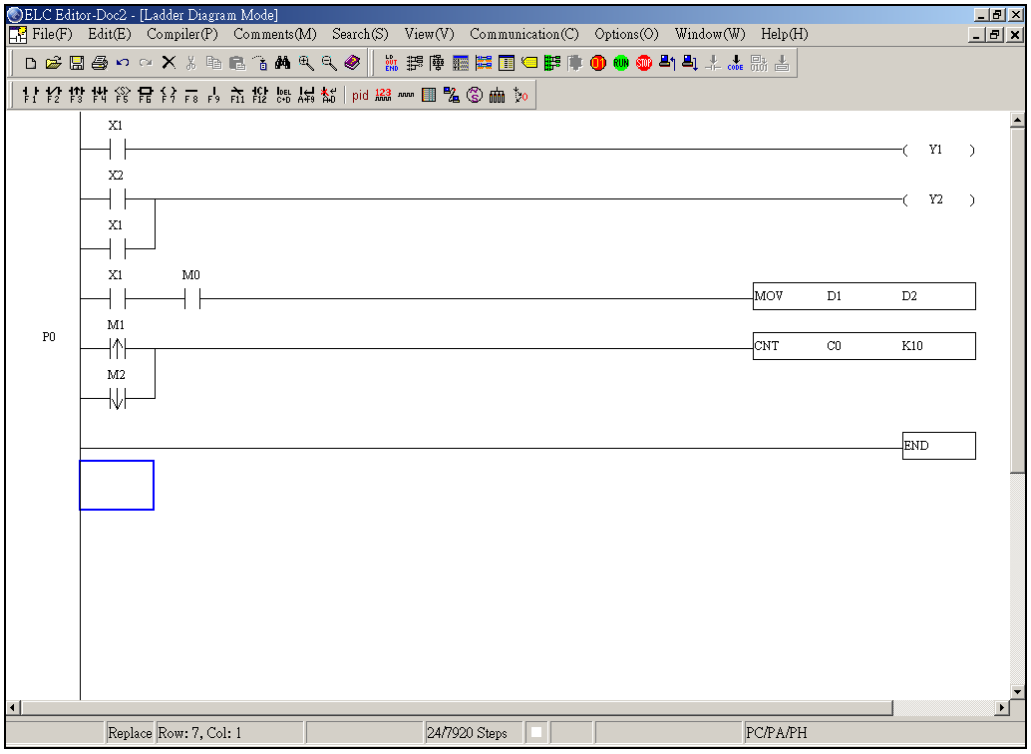


■ Operation Steps of Editing the Ladder Diagram:

Step	Ladder Symbol	Cursor Location	Input by clicking the Icon on toolbar		Input by using the Keyboard
1	⊣ ⊢	Row: 0, Column: 1	F1 *Footnote 1	Device name: X Device number: 1	LD X1 ↵ or A X1 ↵
2	—( )	Row: 0, Column: 2	F7 *Footnote 2	Device name: Y Device number: 1	OUT Y1 ↵ or O Y1 ↵
3	⊣ ⊢	Row: 1, Column: 1	F1	Device name: X Device number: 2	LD X2 ↵ or A X2 ↵
4	|	Row: 1, Column: 2	F9		F9
5	—( )	Row: 1, Column: 2	F7	Device name: Y Device number: 2	OUT Y2 ↵ or O Y2 ↵
6	⊣ ⊢	Row: 2, Column: 1	F1	Device name: X Device number: 1	LD X1 ↵ or A X1 ↵
7	⊣ ⊢	Row: 3, Column: 1	F1	Device name: M Device number: 0	LD M0 ↵ or A M0 ↵

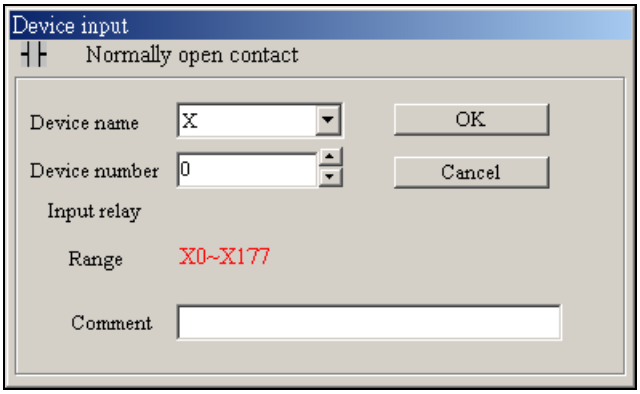
Step	Ladder Symbol	Cursor Location	Input by clicking the Icon on toolbar		Input by using the Keyboard
8		Row: 3, Column: 2	 *Footnote 3	MOV instruction OP 1: D Device number: 1 OP 2: D Device number: 2	MOV D1 D2 ↵
9		Row: 4, Column: 0		Double click the mouse and enter P0	P0 ↵
10		Row: 4, Column: 1		Device name: M Device number: 1	LDP M1 ↵ or + M1 ↵
11		Row: 4, Column: 2			F9
12		Row: 4, Column: 2		CNT instruction OP 1: C Device number: 0 OP 2: K Device number: 100	CNT C0 K100 ↵
13		Row: 5, Column: 1		Device name: M Device number: 1	LDF M1 ↵ or – M1 ↵
14		Row: 6, Column: 1		END instruction	END ↵

■ After the ladder diagram is completed, you can compiler and convert the completed ladder diagram to instruction code and SFC diagram. The ladder diagram is shown as the figure below:

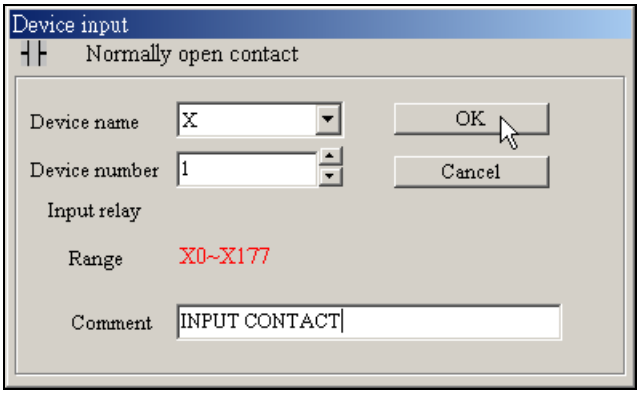


*Footnote 1: Input Basic Instruction

1. Click the icon  on toolbar or press the F1 function key on the keyboard and the “Device input” dialog box will appear. Then, you can enter device name and number, and edit comments in this dialog box.

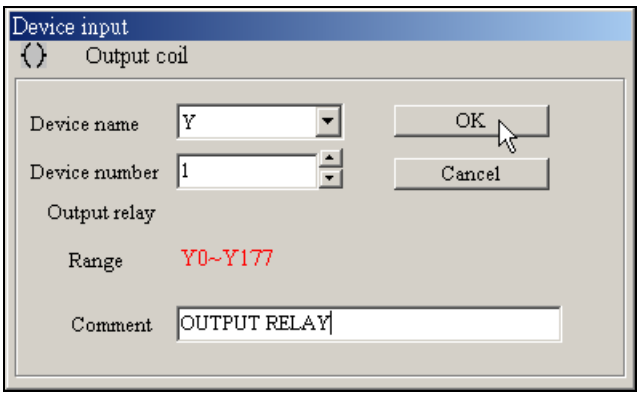


2. For example, select or type the device name “X” and device number “1”. Then, press Enter key on the keyboard or click the button “OK” to save the setting.



*Footnote 2: Input Output Coil

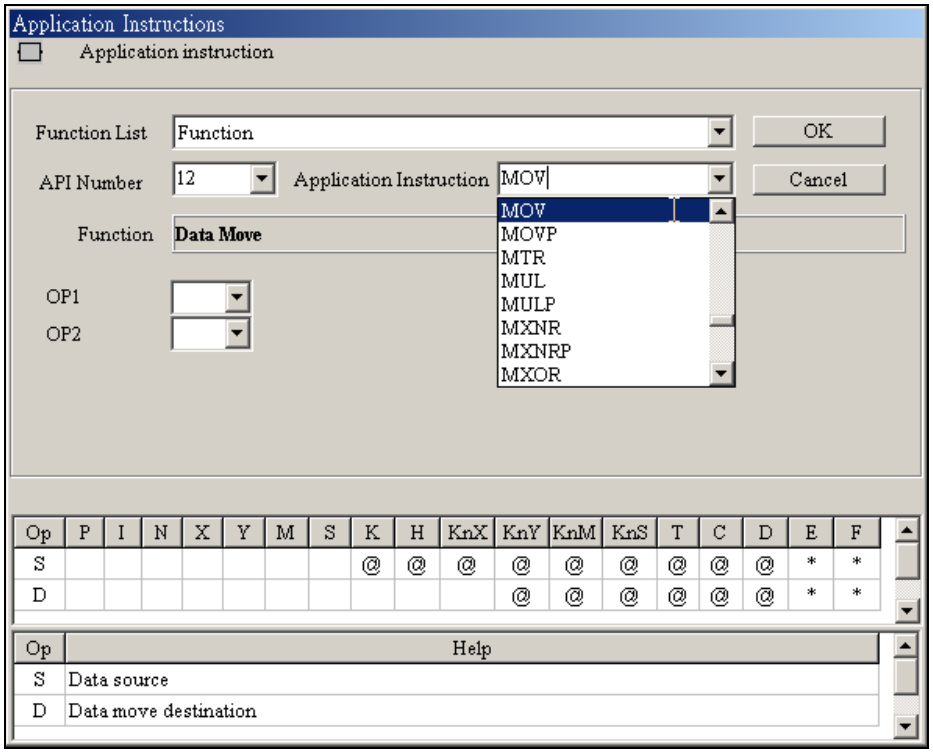
1. Click the icon  on toolbar or press the F7 function key on the keyboard and the “Device input” dialog box will appear. Then, you can enter device name and number, and edit comments in this dialog box.



2. For example, select or type the device name “Y” and device number “1”. Then, press Enter key on the keyboard or Click the button “OK” to save the setting.

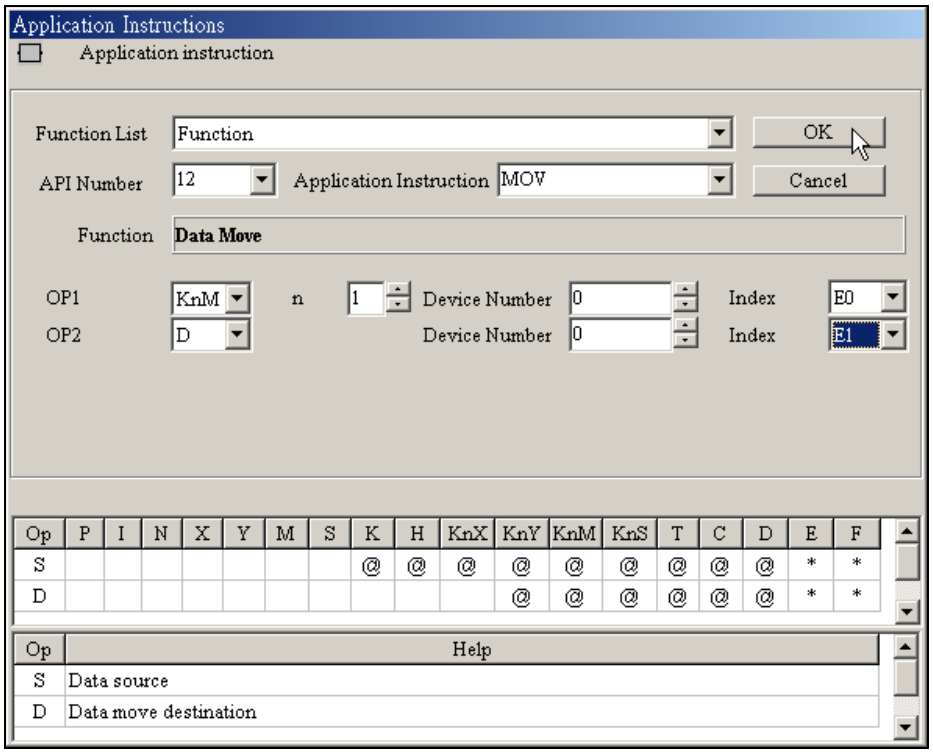
*Footnote 3: Input Application Instruction

1. Click the icon  on toolbar or press the F6 function key on the keyboard. Then, the "Application instruction" dialog box will appear.



2. First, choose one selection in the function list menu (including all application instructions and output commands, etc.). Then, select the API Number or choose the instruction from pull-down menu, or type the name of the instruction directly, e.g. MOV in the application instruction list box. After all settings are completed, press Enter key on the keyboard.

3. Select “Transfer and Compare” from pull-down menu in the function list box and type “MOV” into the “Application Instruction” list box directly (or choose “MOV” instruction from pull-down menu in the “Application Instruction” dialog box). Then, press Enter key on the keyboard, and the dialog box shown below will appear on the screen.



4. Input device name in “OP1” (Operand 1) and “OP2” (Operand 2) list box, and device number in “Device Number” list box in order. Select index register E or F if it exists. Then, press the button “OK” to save the setting.

5. Moreover, you can also double click the mouse on the “@” or “*” symbol in the device reference table (refer to the figure above) to designate the device name (The symbol @ indicates this device can be modified by index register E or F and the symbol * indicates this device can not be modified by index register E or F)

4.4 Ladder Diagram Editing Explanation

♦ Input Brevity Code

■ ELCSoft provides several brevity codes for yours to input Instructions more quickly and conveniently when editing a ladder diagram.

Explanation	Instruction Icon	Instruction Code (Mnemonic Code)	Brevity Code	Example
Normally open contact		LD	A	LD M0 or A M0
Normally closed contact		LDI	B	LDI M0 or B M0
Rising pulse		LDP	+	LDP M0 or + M0
Falling pulse		LDF	–	LDF M0 or – M0
Output coil		OUT	O	OUT M0 or O M0

♦ Insert / Replace Mode

■ Use the Insert key on the keyboard can switch to the Insert Mode or the Replace Mode when editing a ladder diagram.

◈ If the “Replace” word is displayed on the status bar, press the Insert key on the keyboard could switch to the Insert Mode. In the Insert Mode, insert a new ladder diagram to where the editing block locates, and the original ladder diagrams following the new diagram would shift one space to the right.

◈ If the “Insert” word is displayed on the status bar, press the Insert key on the keyboard could switch to the Replace Mode. In Replace Mode, insert a new ladder diagram could replace the original ladder diagram located in the editing block, and the following other ladder diagrams would not be changed.

♦ Editing

■ Undo: Undo an action you perform. (ELCSoft allows you can undo 10 times maximum)

◈ Method 1: Click “Edit” > “Undo”

◈ Method 2: Click the icon  on toolbar

◈ Method 3: Use keyboard shortcuts by pressing keys (Ctrl) + (Z)

◈ Method 4: Right click the mouse and select the “Undo” command in the pop-up menu

■ Redo: Redo an action. If you don’t like the result of undoing an action, you can redo it.

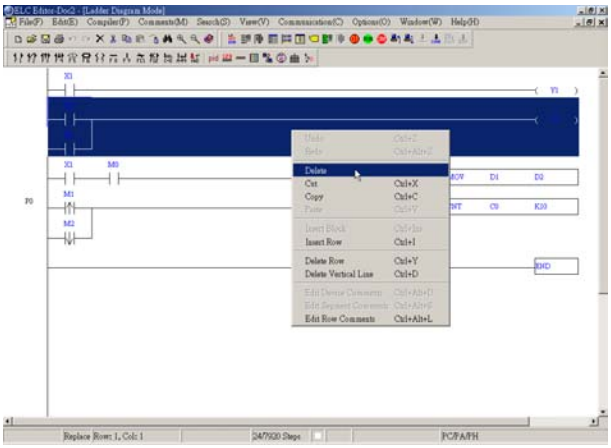
◈ Method 1: Click “Edit” > “Redo”. If you click “Redo” after an Undo action, it can return to the last action before you undo it.

◈ Method 2: Click the icon  on toolbar

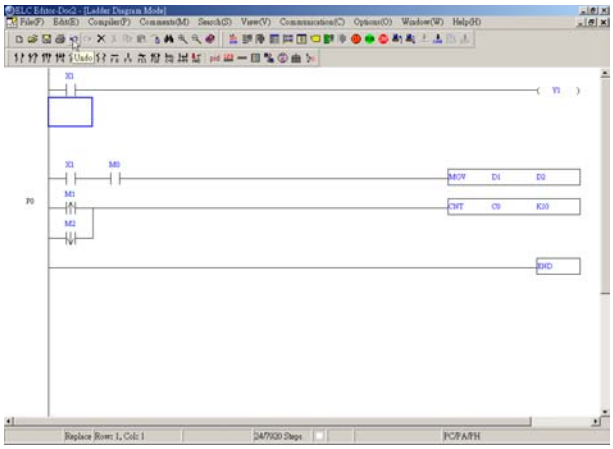
◈ Method 3: Use keyboard shortcuts by pressing keys (Ctrl) + (Alt) + (Z)

◈ Method 4: Right click the mouse and select the “Redo” command in the pop-up menu

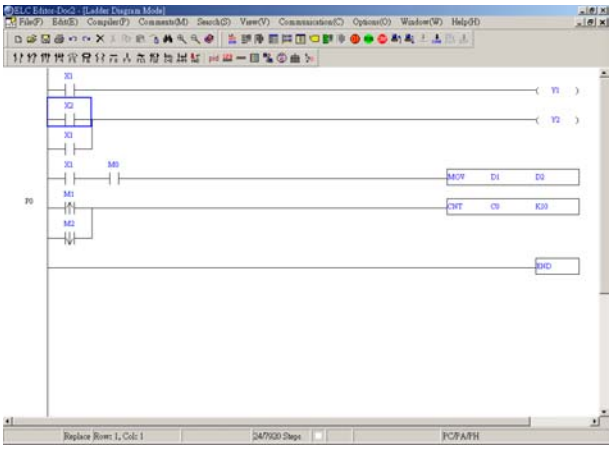
Select Block: drag the cursor to select the block you want. Delete the selected block.



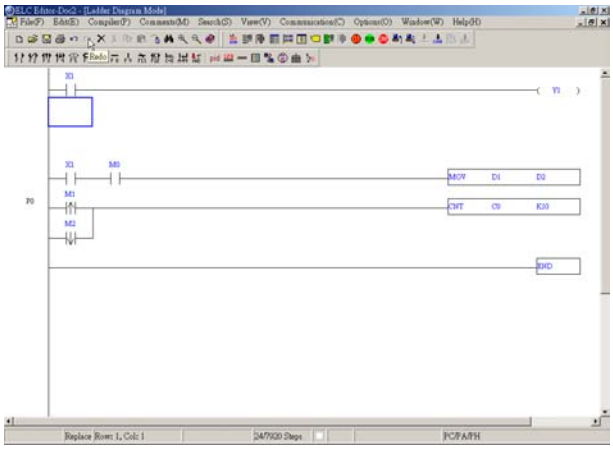
After delete the block, the programs listed below the block will move up. Then, click the icon  (“Undo”).



It will return to its previous status (the most recent action).



After return to its previous status, click the icon  (“Redo”), the programs listed below the block will move up.



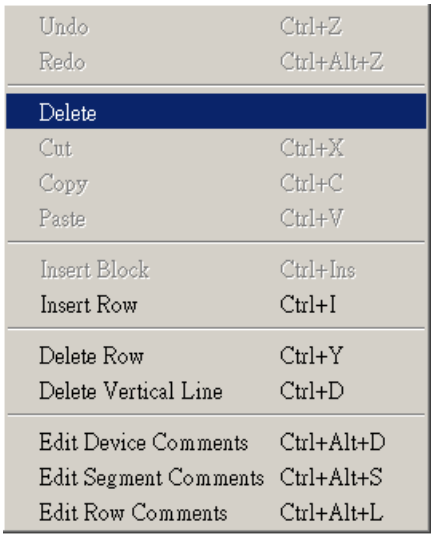
■ Delete: Delete the selected block, e.g. devices

◈ Method 1: Click “Edit” > “Delete”

◈ Method 2: Click the icon  on toolbar

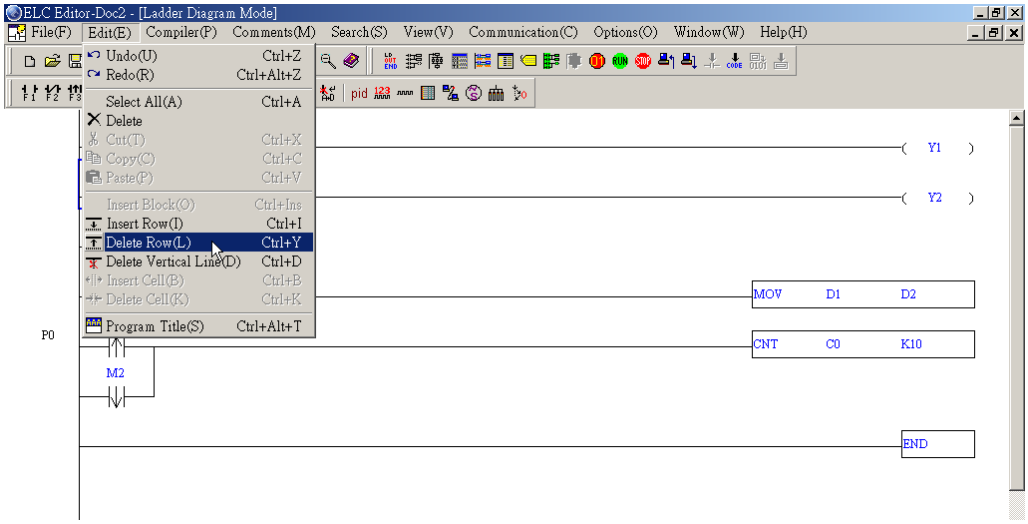
◈ Method 3: Use keyboard shortcuts by pressing key (Delete)

◈ Method 4: Right click the mouse and select the “Delete” command in the pop-up menu



■ Delete Rows: Delete a row or several rows in the ladder diagram

◈ Method 1: Click “Edit” > “Delete Rows”



◈ Method 2: Use keyboard shortcuts by pressing keys (Ctrl) + (Y)

◈ Method 3: Right click the mouse and select the “Delete Rows” command in the pop-up menu

◈ Method 4: Select the block that you want to delete and right click the mouse to select the “Delete Rows” command in the pop-up menu or pressing the Delete key on the keyboard. Clicking the icon  on toolbar also can delete the selected block.

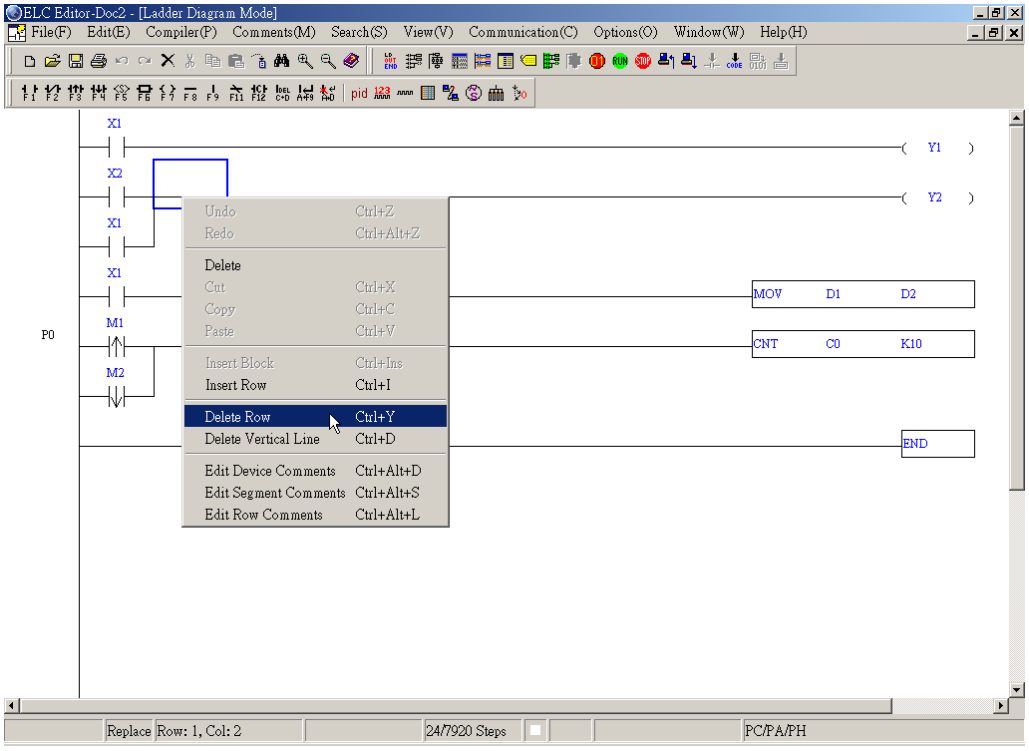
■ Delete Vertical Line: Delete the vertical line on the left-hand side of the editing block

◈ Method 1: Click “Edit” > “Delete Vertical Line”

◈ Method 2: Use keyboard shortcuts by pressing keys (Ctrl) + (D)

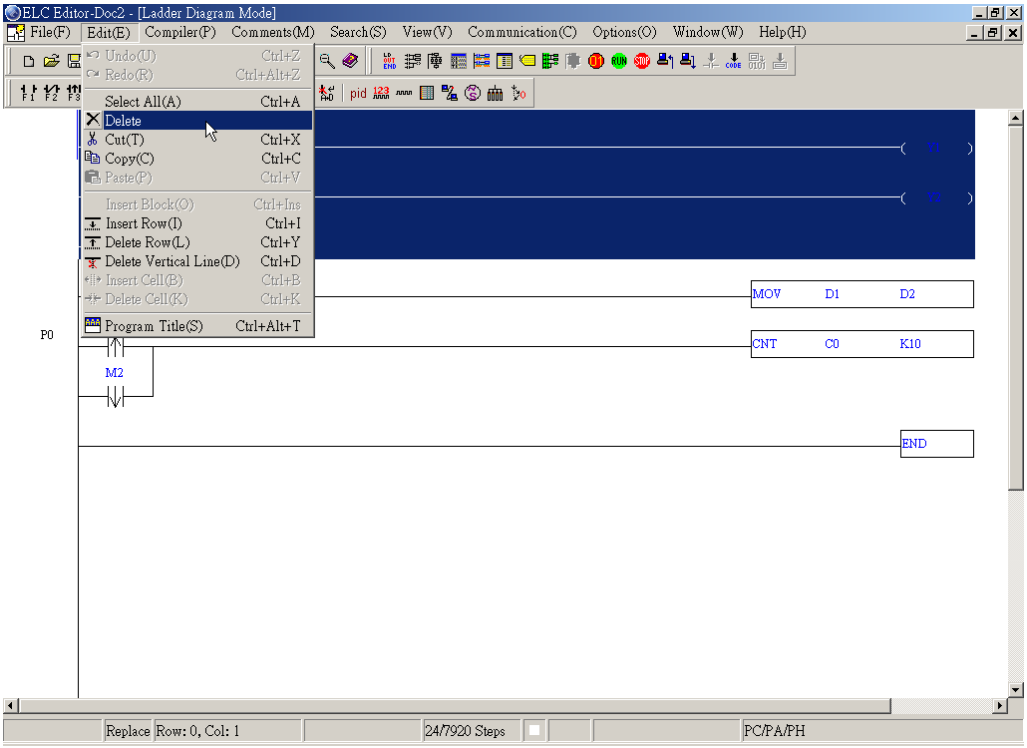
◈ Method 3: Move the editing block to the right-hand side of the vertical line that you want to delete and click the icon  on toolbar. Then, the vertical line would be deleted.

◈ Method 4: Move the editing block to the right-hand side of the vertical line that you want to delete. Right click the mouse and select the “Delete Vertical Line” command in the pop-up menu. Then, the vertical line would be deleted (refer to the figure below).



■ Delete Block: Deleted the selected block

◈ Method 1: Selected the block that you want to delete and then click “Edit” > “Delete”



◈ Method 2: Select the block that you want to delete and click the icon  on toolbar.

◈ Method 3: Select the block that you want to delete and right click the mouse to select the “Delete” command in the pop-up menu.

◈ Method 4: Select the block that you want to delete and press the Delete key on the keyboard.

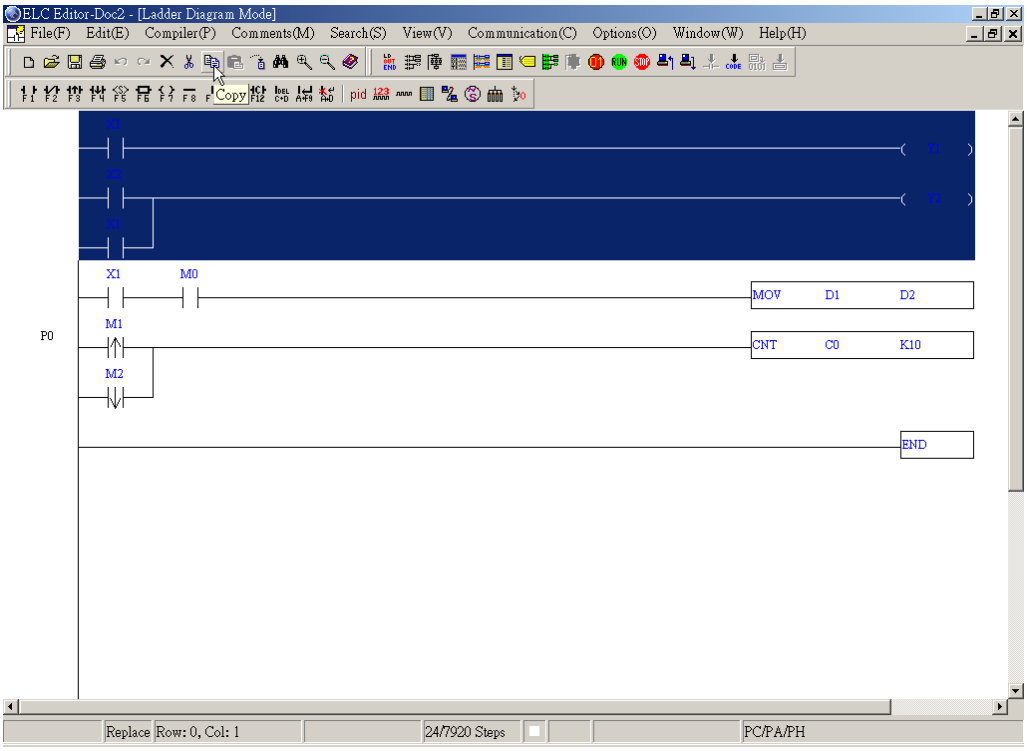
■ Copy Block: Copy the selected block

◈ Method 1: Click “Edit” > “Copy”

◈ Method 2: Click the icon  on toolbar

◈ Method 3: Use keyboard shortcuts by pressing keys (Ctrl) + (C)

◈ Method 4: Right click the mouse to select the “Copy” command in the pop-up menu



■ Cut Block: Cut the selected block

◈ Method 1: Click “Edit” > “Cut”

◈ Method 2: Click the icon  on toolbar

◈ Method 3: Use keyboard shortcuts by pressing keys (Ctrl) + (X)

◈ Method 4: Right click the mouse and select the “Cut” command in the pop-up menu

■ Paste Block: Paste the selected block

◈ Method 1: Click “Edit” > “Paste”

◈ Method 2: Click the icon  on toolbar

◈ Method 3: Use keyboard shortcuts by pressing keys (Ctrl) + (V)

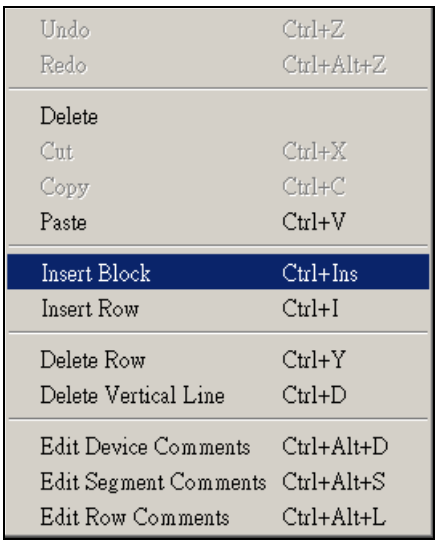
◈ Method 4: Right click the mouse and select the “Paste” command in the pop-up menu

■ Insert Block (Before inserting the selected block, perform “Copy Block” action first)

◈ Method 1: Click “Edit” > “Insert Block”

◈ Method 2: Use keyboard shortcuts by pressing keys (Ctrl) + (Ins)

◈ Method 3: Right click the mouse and select the “Insert Block” command in the pop-up menu.



- Compiler

This function is used to compile current ELC programs. If the you complete the editing of the ladder diagram in the ladder diagram mode, performing this function will check whether the ladder diagram is valid or not, and if the conversion is correct, the ladder diagram could thus be converted to the instruction program or the SFC diagram. And at the same time, the program memory addresses (numbers of steps) for each editing block will appear on the left-hand side of the start of the ladder diagram. However, if an error occurred, a ladder diagram error message dialog box will appear, display the error code and point out the exact erroneous addresses after the compiler action is completed (please refer to the ELC user manual).

If the program editing is completed in the instruction mode when performing this function, it will start to check whether the conversion is correct or not, and if the conversion is correct, the instruction program will be converted to the ladder diagram. However, if error occurred, an error message dialog box will appear, display the error code and point out the exact erroneous steps after the compiler action is completed (Please refer to the ELC User Manual).

Error message dialog box:

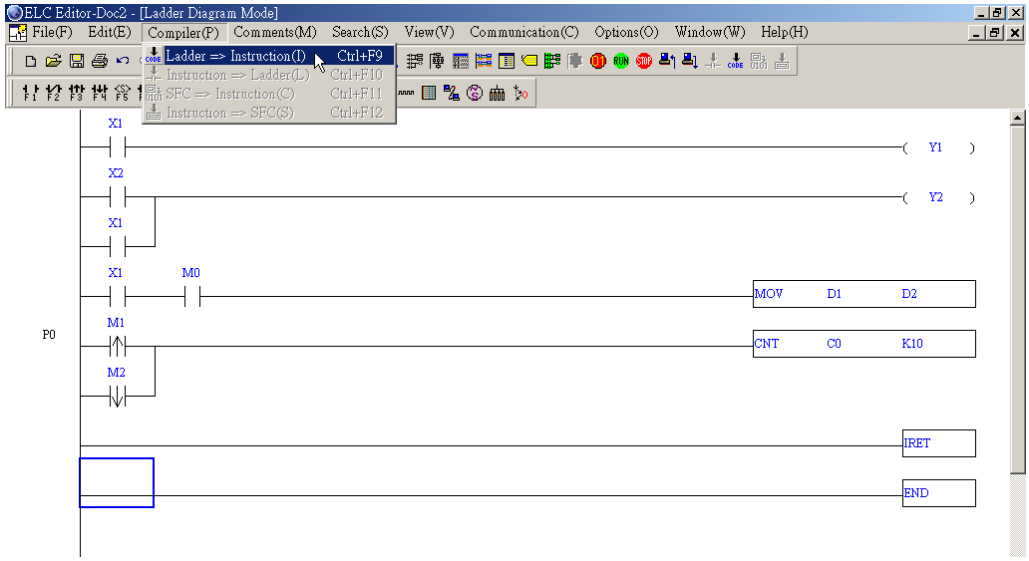
In ladder diagram mode:

In ladder diagram mode:

In instruction mode:

■ Ladder Diagram => Instruction (only for ladder diagram mode)

◈ Method 1: Click “Compiler” > “Ladder => Instruction”

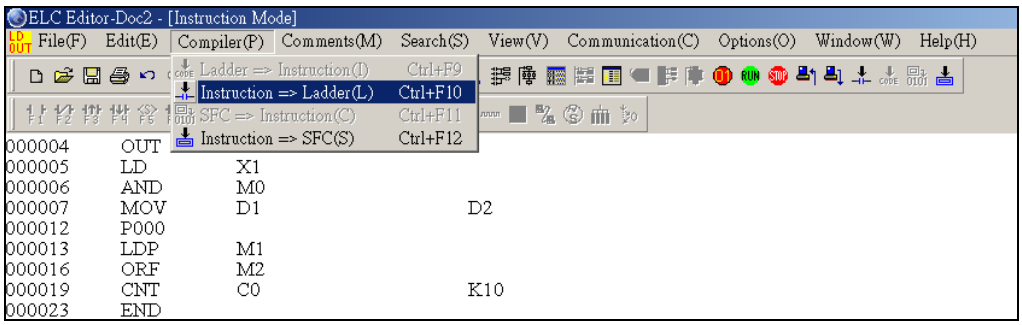


◈ Method 2: Click the icon  on toolbar

◈ Method 3: Use keyboard shortcuts by pressing keys (Ctrl) + (F9)

■ Instruction => Ladder Diagram (only for Instruction mode)

◈ Method 1: Click “Compiler” > “Instruction => Ladder”

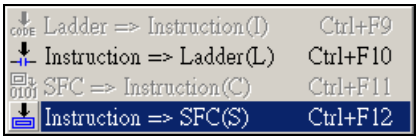


◈ Method 2: Click the icon  on toolbar

◈ Method 3: Use keyboard shortcuts by pressing keys (Ctrl) + (F10)

■ Instruction => SFC (only for Instruction mode)

◈ Method 1: Click “Compiler” > “Instruction => SFC”

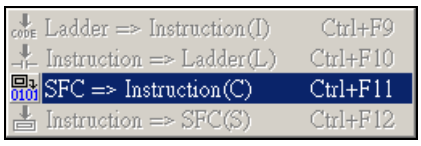


◈ Method 2: Click the icon  on toolbar

◈ Method 3: Use keyboard shortcuts by pressing keys (Ctrl) + (F12)

■ SFC => Instruction (only for SFC mode)

◈ Method 1: Click “Compiler” > “SFC => Instruction”



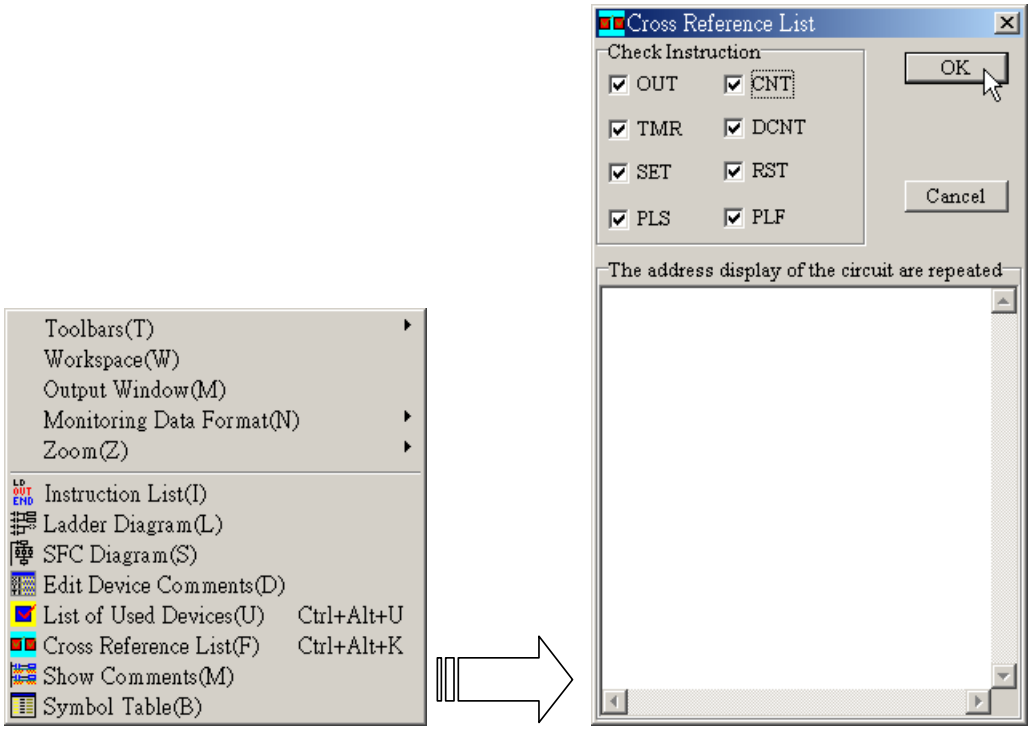
◈ Method 2: Click the icon  on toolbar

◈ Method 3: Use keyboard shortcuts by pressing keys (Ctrl) + (F11)

♦ Cross Reference List

Select this command to examine the programs and check the device repeated use condition of the application instructions, such as OUT, CNT, TMR, DCNT, SET, RST, PLS, and PLF, etc.

◈ Method 1: Click “View” > “Cross Reference List”. The “Cross Reference List” dialog box will appear. You can tick the instructions that you want to examine and then press the button “OK”. Then, it will start the examination and display the result after examination. If there is a double circuit in the program, the repeated addresses will be shown on the screen.



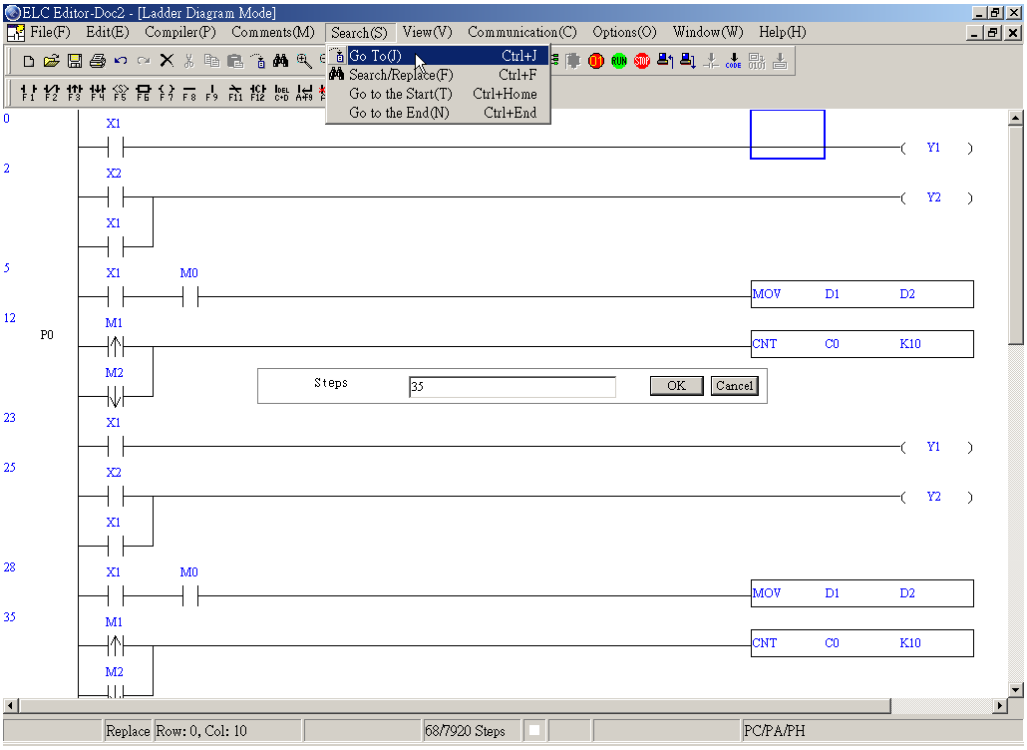
◈ Method 2: Use keyboard shortcuts by pressing keys (Ctrl) + (Alt) + (K)

♦ Search

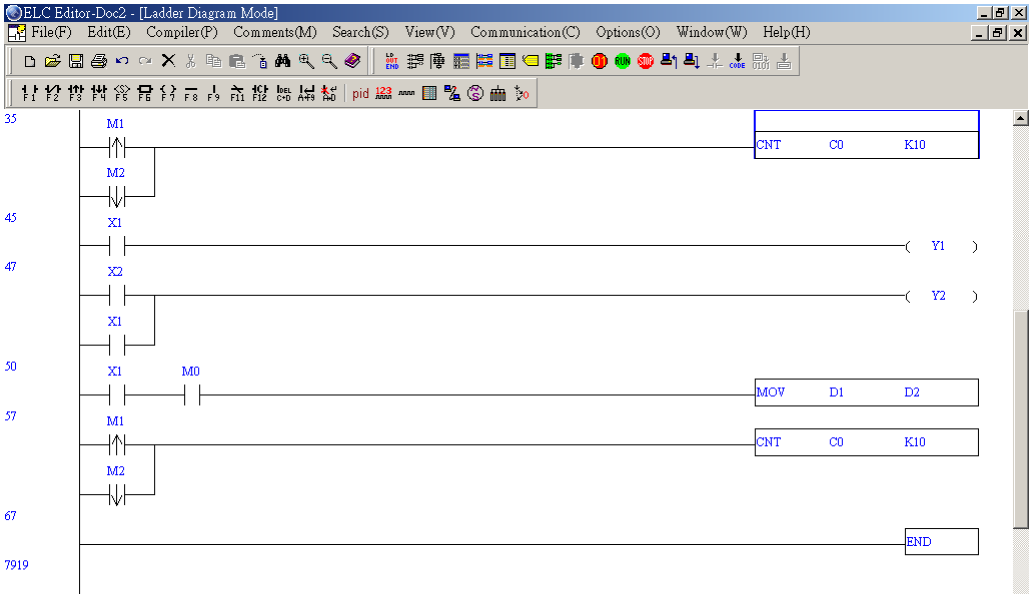
■ Go to

This command is used to specify the program to jump to a designated location (unit: Step). If the designated step already exists, the program will jump to this existing designated step and put it in the first line.

◈ Method 1: Click “Search” > “Go to”



For example, enter the designated step, e.g. 35 where you want to jump to, and then the ladder diagram will put this designated step in the first line (please refer to the figure below).



◈ Method 2: Click the icon  on toolbar

◈ Method 3: Use keyboard shortcuts by pressing keys (Ctrl) + (J)

■ Search/Replace

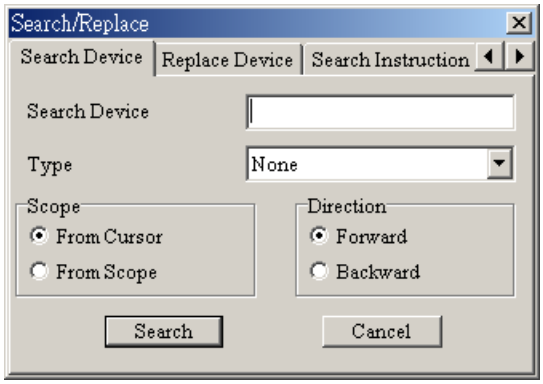
The “Search/Replace” command is used to search and replace the device and instruction within the program (if only the “Search” command is conducted, simply enter the device name to be searched in the dialog box). If the device or the command is found, the view will be scrolled to the device or the command. Also, you can search and replace the device and instruction by specifying the type of the device and instruction.

◈ Method 1: Click “Search” > “Search/Replace”

◈ Method 2: Click the icon  on toolbar

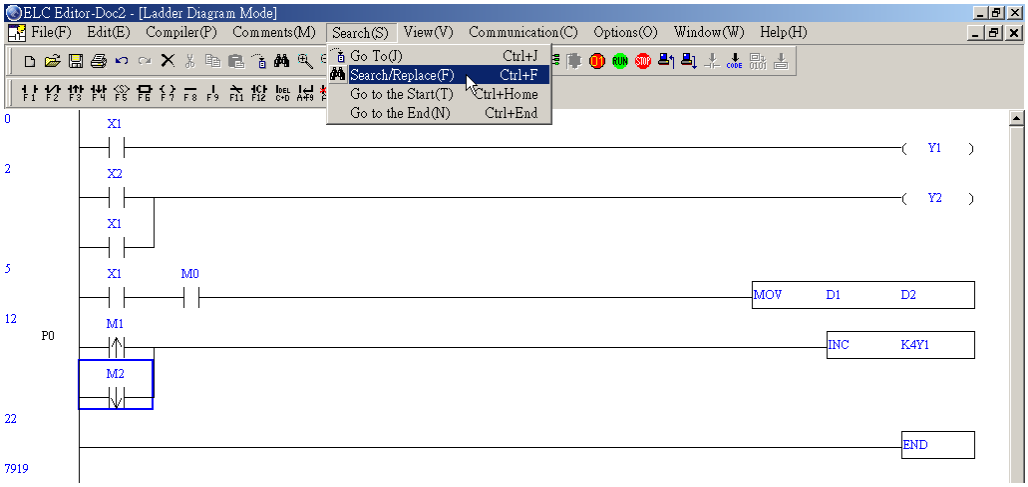
◈ Method 3: Use keyboard shortcuts by pressing keys (Ctrl) + (F)

When choose this “Search/Replace” command, the following dialog box will appear. You can select “search device”, “replace device”, “search instruction” and “replace other instruction” these four functions in this dialog box.

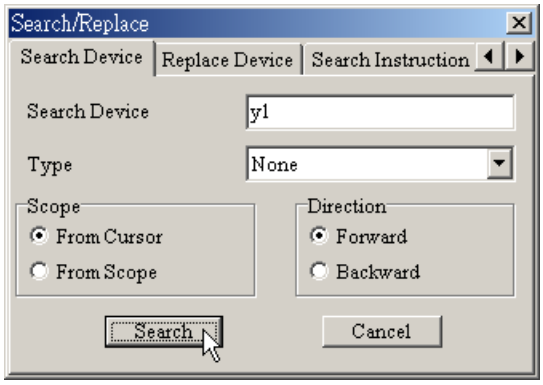


◈ Search Device

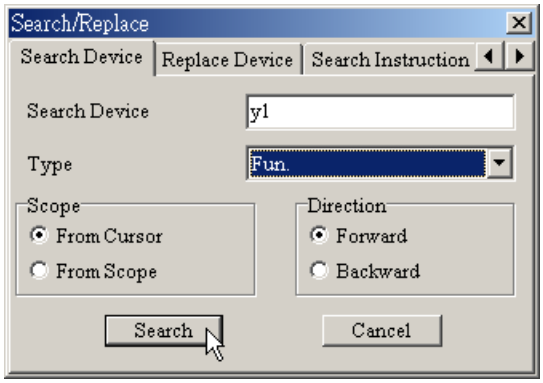
Use this command to search the specified device name in the program. From the example ladder diagram shown below, we can know the instructions that contain device Y1 are OUT Y1 and INC K4Y1.



Choose the “Search Device” dialog box and enter device name “Y1” in the “Search Device” box and select the type “None” from the type list box (refer to the dialog box shown below). Then, press the button “Search”. Two instructions “OUT Y1” and “INC K4Y1” will be found.



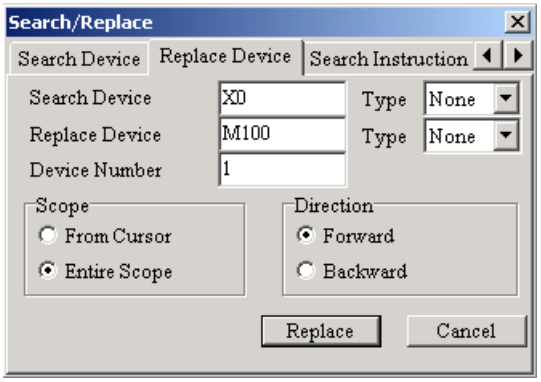
If enter device name “Y1” in the “Search Device” box and specify the type “Fun.” from the type list box (refer to the dialog box shown below). Then, press the button “Search”. Only the instruction “INC K4Y1” will be found.



◈ Replace Device

Use this command to replace the specified device name in the program. For example, choose to open the “Replace Device” dialog box, enter the search device “X0”, select the type “LD”, and enter the replace device “M100”, select the type “LD” and specify the device number as “10”. Then, press the button “Replace”, and the instructions will be changed to LD M100~M109.

Original Command	Replacement Condition	Replaced Command
LD X0~X7 LD X10~X11	Type LD + Device X0 → Type LD + Device M100 Device number: 10	LD M100~M107 LD M108~M109



If you specify the device type as None, Out and Fun these three types, it only can replace the device with the same type. Otherwise, a warning message shown below will appear.

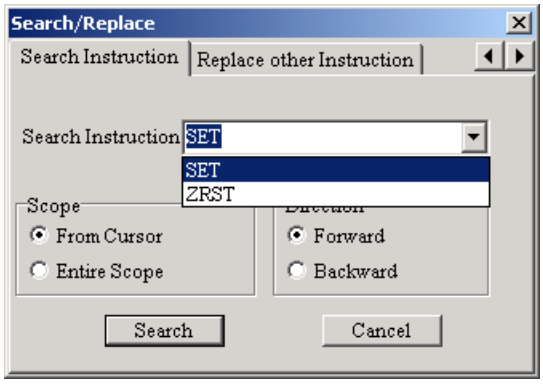
✍ Restrictive Conditions

In “Replace Device” dialog box, only the devices of the same type could be replaced, e.g. if D1 is replaced by D11, it is thus viewed as successful, but if it is replaced by C100, it is then a failure.

◈ Search Instruction

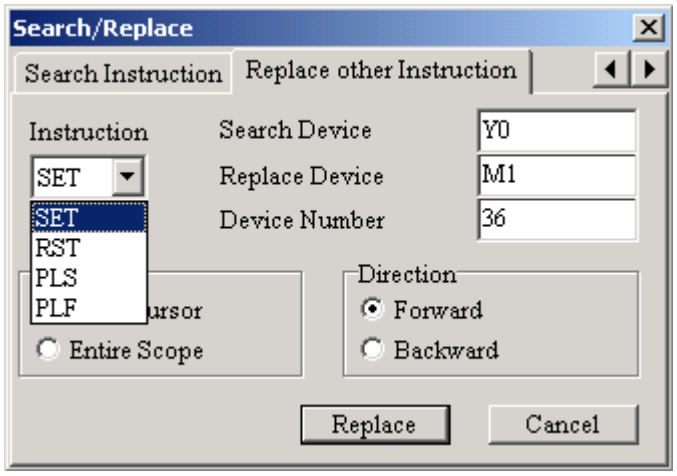
Use this command to search the specified device name in the program. Choose to open the “Search Instruction” dialog box, and enter the instruction name that we are looking for. Then, press the button “Search”.

ELCSoft will record all the instruction names that you had searched before. Next time, if you want to search the instructions that you had searched before, you can just choose the instruction name from the pull-down menu in “search instruction” box.



◈ Replace Other Instruction

ELCSoft provides the condition replace functions of SET, RST, PLS and PLF, these four kinds of instructions. User can replace the devices that meet the condition of these instructions in the program. For example, if user wants to replace SET M0 ~ M35 with SET Y0 ~ Y43, user can perform the settings shown in the figure below.



■ Go to the Start: Jump to the start of the program.

◈ Method 1: Click “Search” > “Go to the Start”

◈ Method 2: Use keyboard shortcuts by pressing keys (Ctrl) + (Home)

■ Go to the End: jump to the end (last row) of the program.

◈ Method 1: Click “Search” > “Go to the End”

◈ Method 2: Use keyboard shortcuts by pressing keys (Ctrl) + (End)

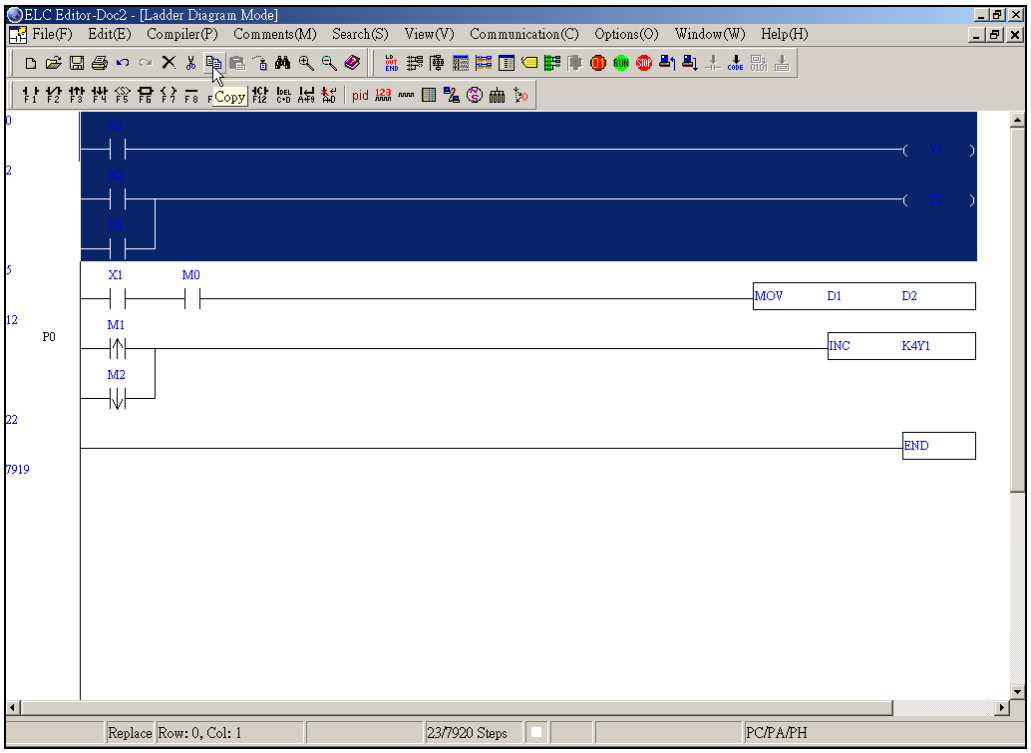
♦ Copy between Files

If user wants to edit two or more than two ELC programs at the same time, simply execute ELCSoft for two or more than two times, and then user could edit different ladder diagrams in different ELCSoft editor windows simultaneously.

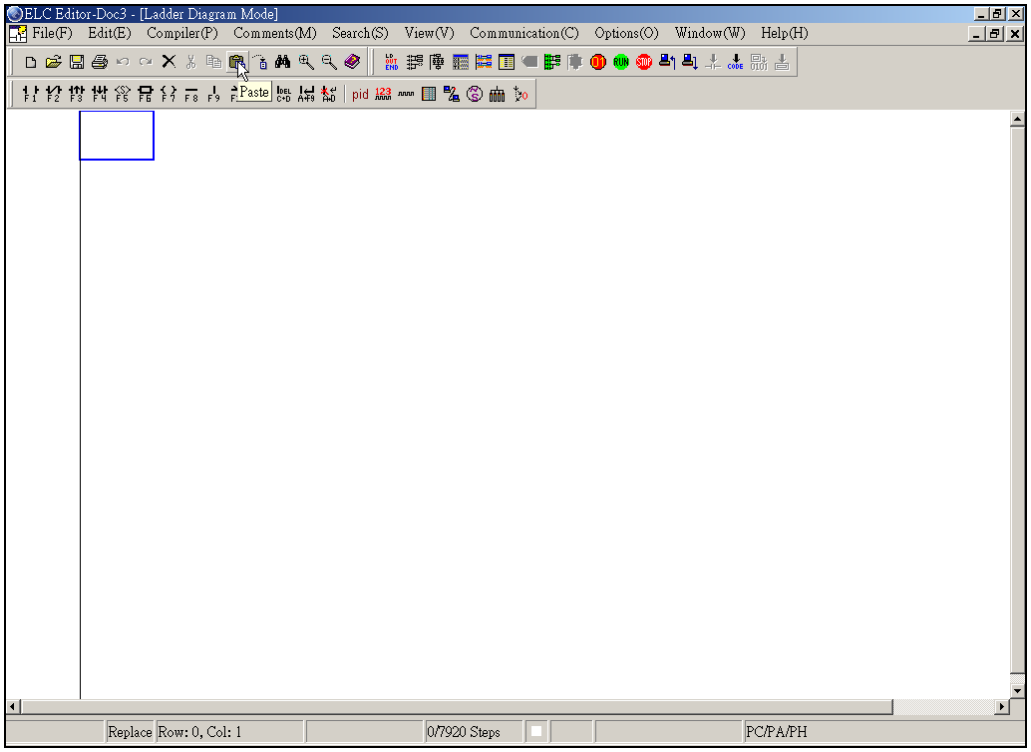
ELCSoft allows user can perform “Copy Block” action from one file to another file. This copy function can be used in the instruction mode (please refer to Section 5.3) and ladder

diagram mode only. User can copy the selected block in the ladder diagram mode of one file (the first ELCSoft window) and paste them onto the ladder diagram mode of another file (the second ELCSoft window). In other word, user can perform copy and paste function between different files but their editing mode should be the same. ELCSoft does not allow user to copy and paste in different files if their editing modes are not the same. Therefore, if user copy the selected block in the ladder diagram mode of one file and paste them on the instruction mode of another file, the copied block will not be copied or pasted.

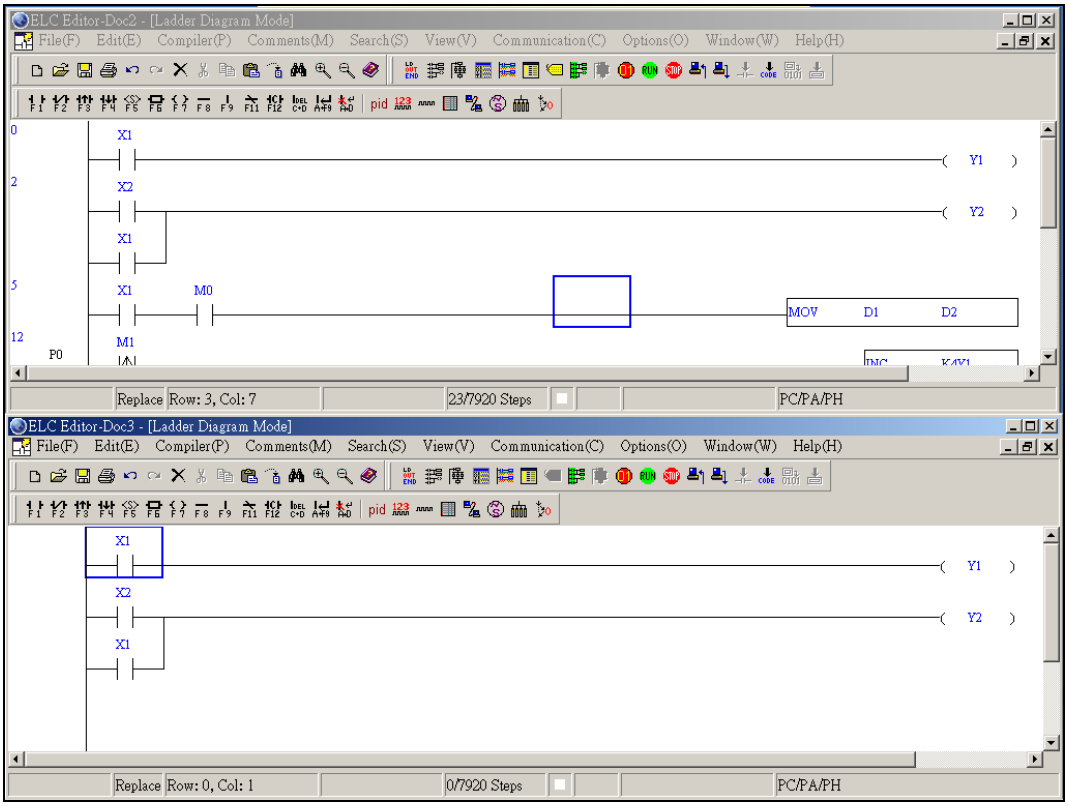
1. Copy the selected block from the ladder diagram mode of the first ELCSoft window.



2. Paste the copied block onto the ladder diagram mode of the second ELCSoft window.

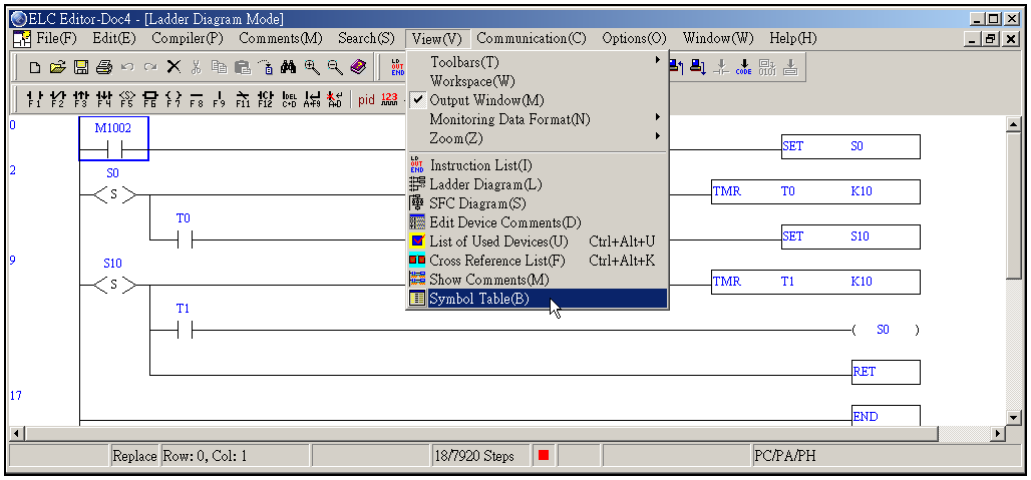


3. Copy between these two files is completed.

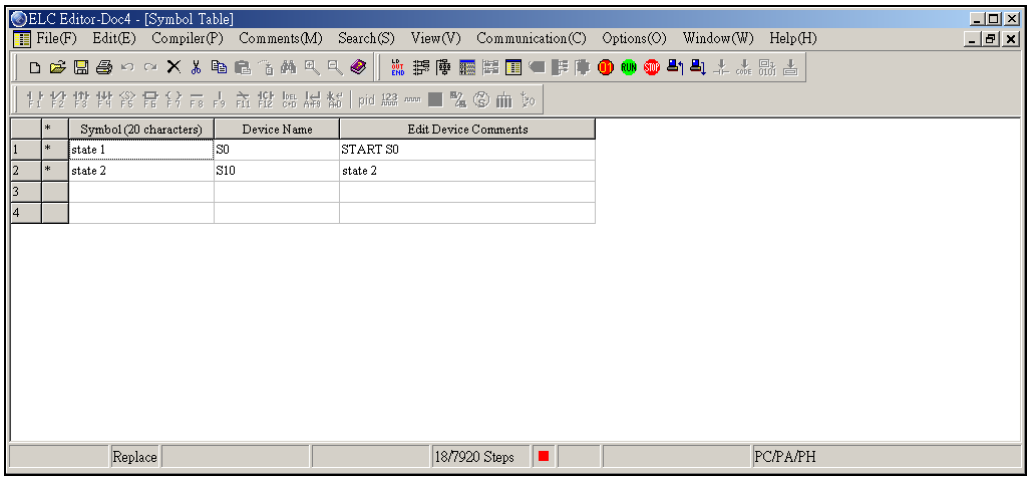


4.5 Symbol Editing Explanation

1. Click “View” > “Symbol Table(B)” to get "Symbol table" window

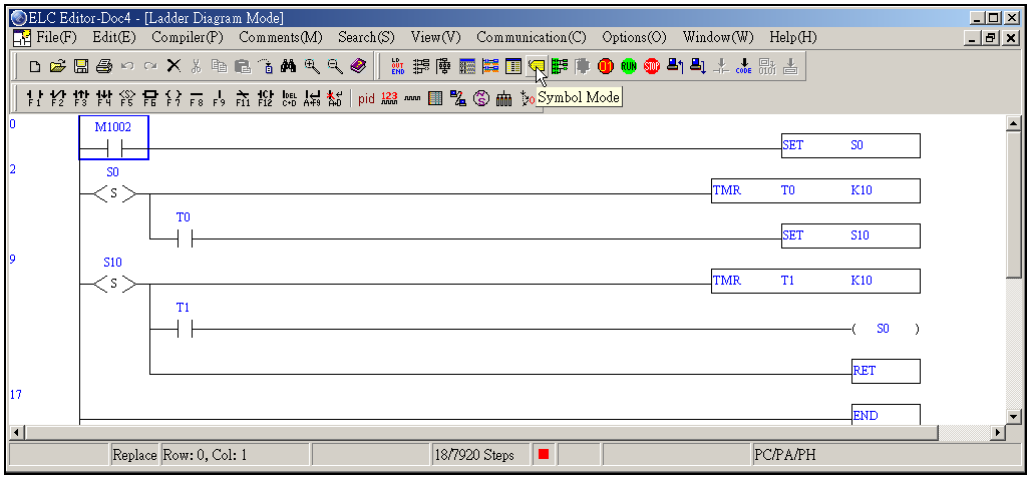


2. The symbol that corresponds to edited device name. It can use Device Name and Symbol to input when editing program. In symbol mode, you can also input symbol name to search or replace.

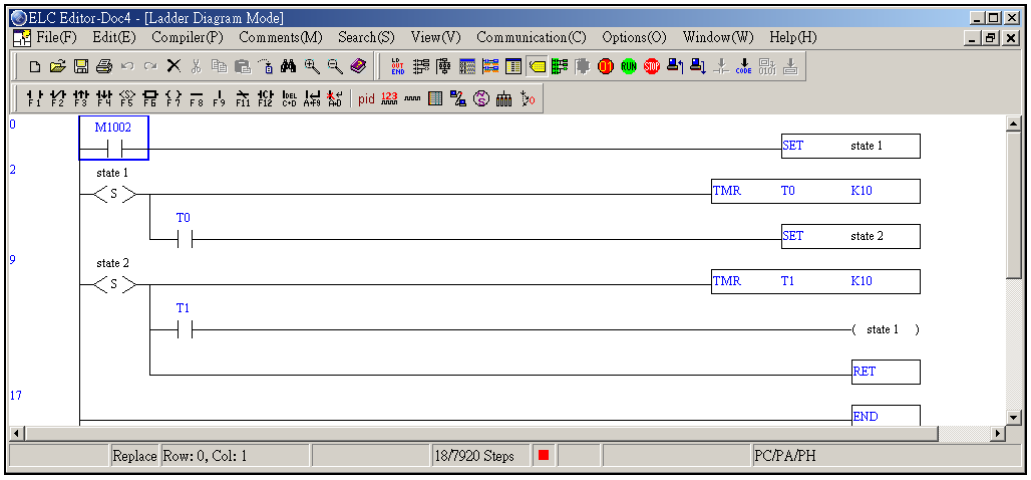


3. Click “Options” > “ Font Setting and Comment Format” choice symbol name display enabled, or Click the icon on the toolbar.

Device Name mode:

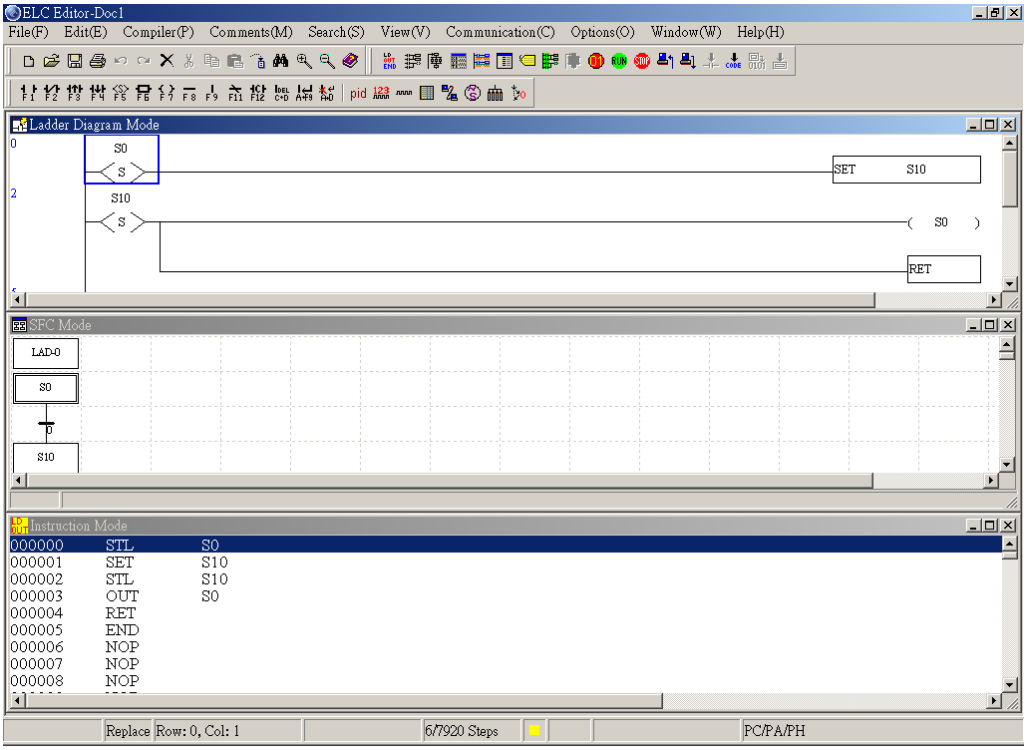


Symbol mode:


ELC Editor-Doc4 - [Ladder Diagram Mode]
File(F) Edit(E) Compiler(P) Comments(M) Search(S) View(V) Communication(C) Options(O) Window(W) Help(H)
0
M1002
SET state 1
2
state 1
S
TMR T0 K10
T0
SET state 2
9
state 2
S
TMR T1 K10
T1
(state 1)
RET
17
END
Replace Row: 0, Col: 1
18/7920 Steps
PC/PA/PH

ELCSoft provides three modes for editing ELC programs. The ladder diagram mode (Please refer to Chapter 4) and instruction mode are two familiar operation modes for users to edit ELC programs. These two modes can be converted to each other through compiling.

5.1 Editing Environment



5.2 Basic Operation

This section describes various functions (include Delete, Insert, Block Copy and Replace, etc.) that provided by ELCSoft for creating and editing the instruction programs.

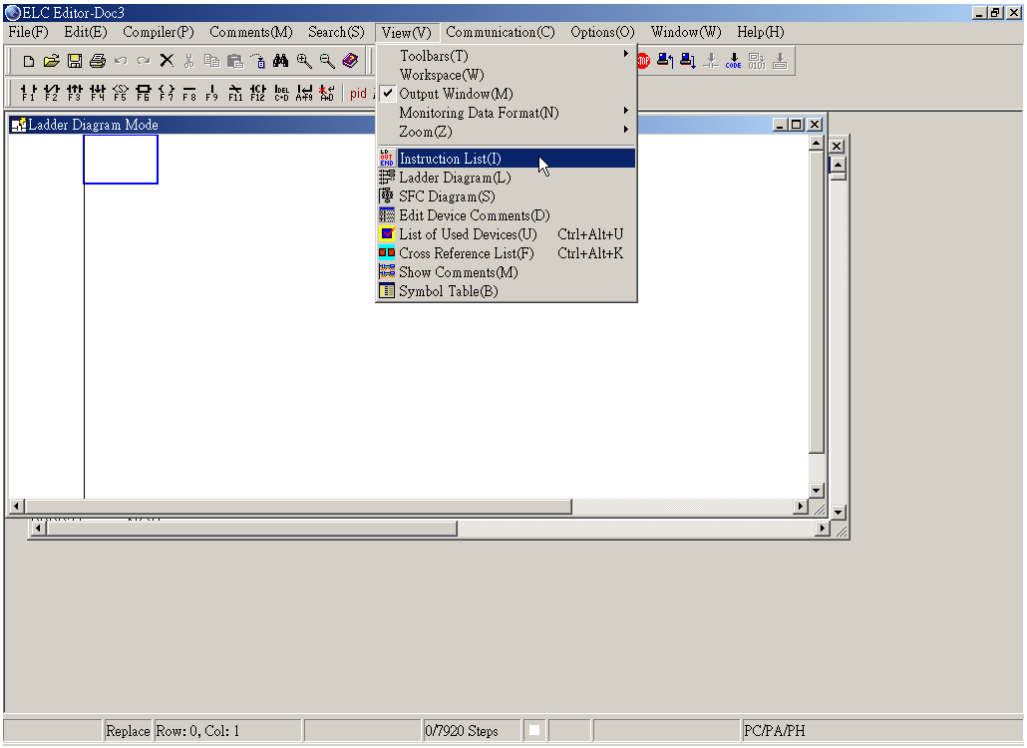
- Input ELC Instructions

After entering the instruction mode, type a complete ELC instruction immediately. If the instruction format is valid, press the Enter key on your keyboard to complete the setting. The instructions that you type will locate in the editing area and the program memory address of ELC will appear on the left-hand side of the program. Thus, users can get the corresponding program memory address of the instruction clearly. Please refer to ELC User Manual for the formats of all instructions.

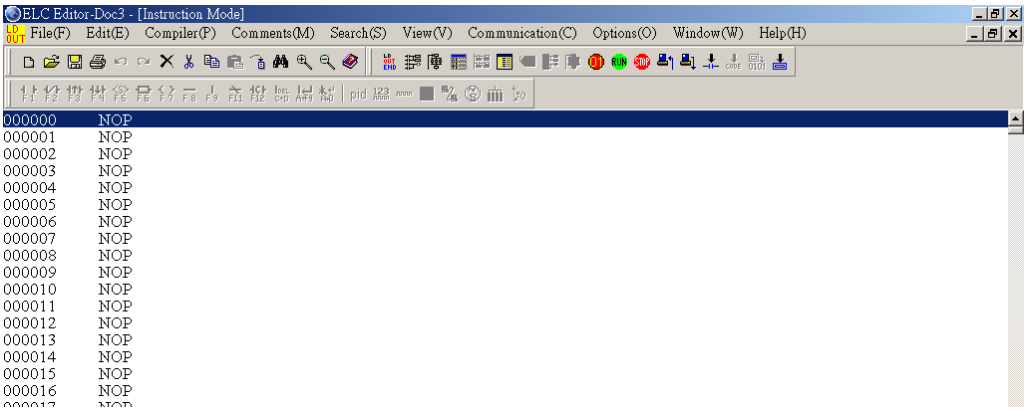
5 Instruction Mode

Enter the Instruction Mode:

1. Execute ELCSoft and choose “New” command to create a new document (or click the icon  on toolbar). Then click “View” > “Instruction List(I)” (or click the icon  on toolbar)



2. Start to input instruction program at the blue highlighted editing row.

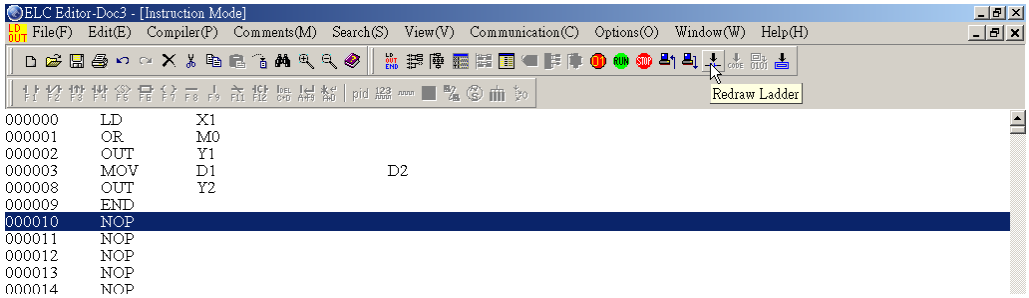


■ Input Operation Example

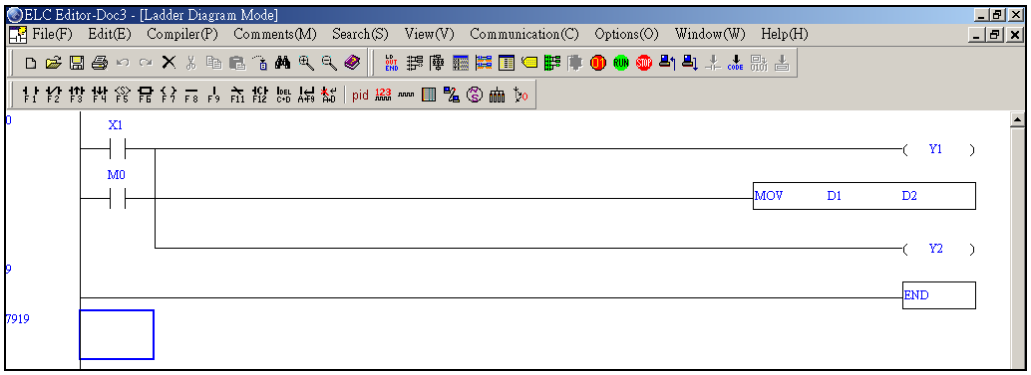
Instruction program…refer to the following table and input programs

```
(0000)   LD     X1
(0001)   OR     M0
(0002)   OUT    Y1
(0003)   MOV    D1   D2
(0008)   OUT    Y2
(0009)   END
```

After an instruction program is completed, it can be converted to the ladder diagram and SFC diagram through compiling.



The converted ladder diagram is shown as the figure below:



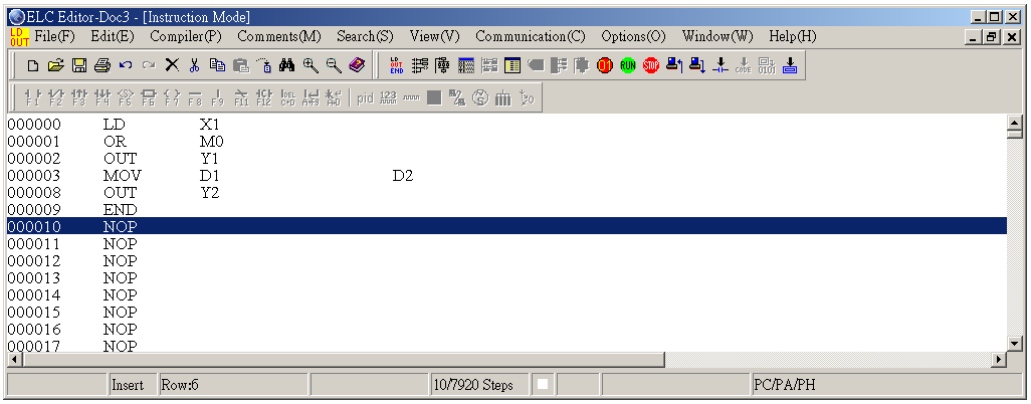
No matter you are editing programs in ladder diagram mode, instruction mode or SFC mode, if the program is edited or revised, be sure to compile the program before writing it into ELC (please refer to Section 4.4).

5.3 Instruction Diagram Editing Explanation

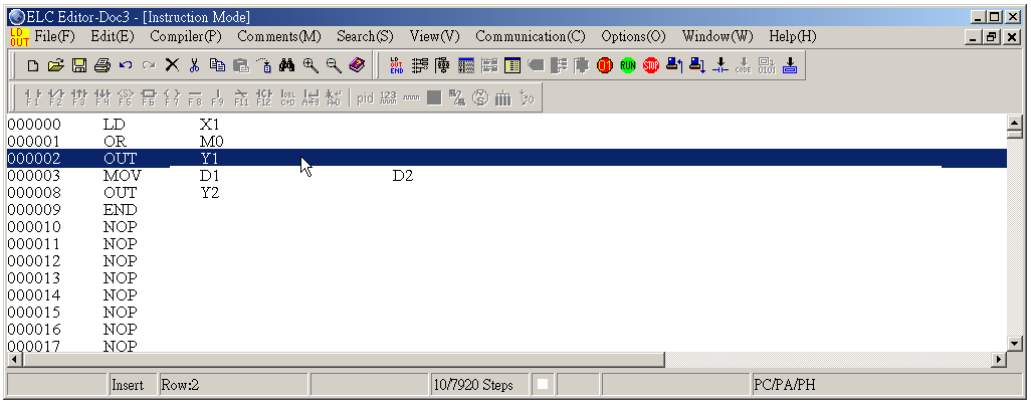
Insert / Replace Mode

Use the Insert key on the keyboard can switch to the Insert mode or the Replace mode. If the “Replace” word is displayed on the status bar, pressing the Insert key on the keyboard could switch to the Insert mode.

1. Enter the Insert mode, and if the following program has already existed:

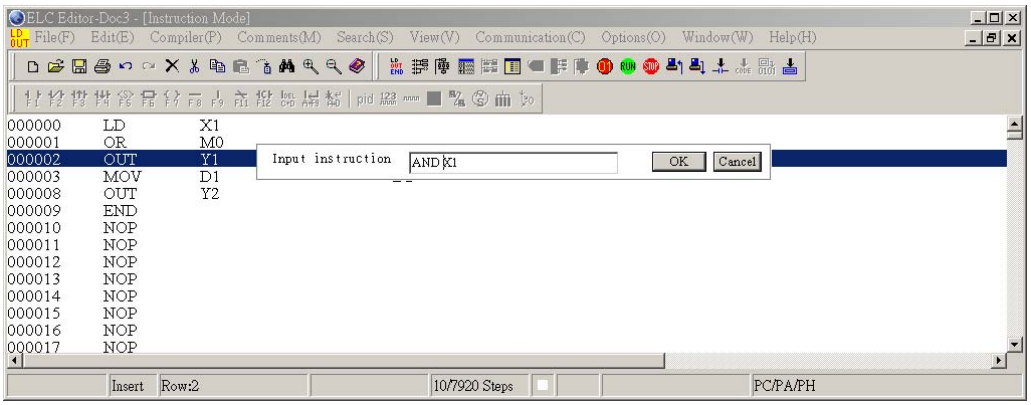


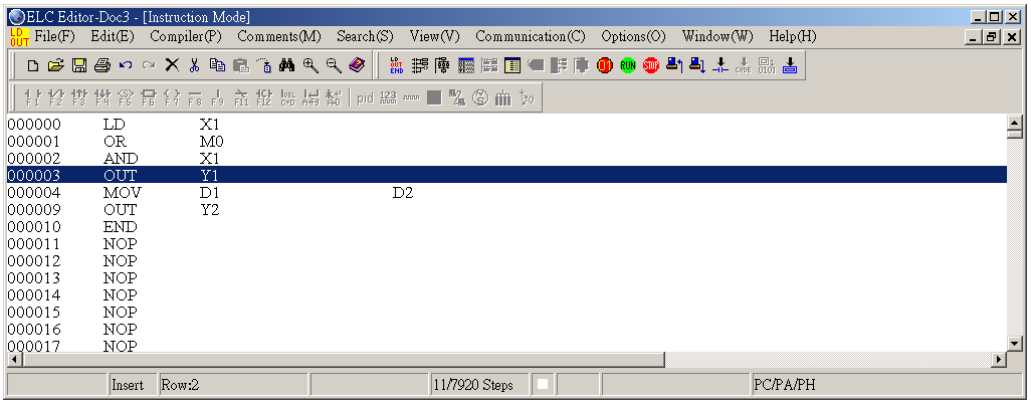
2. Move the blue highlighted editing row to the position of STEP 00002 (OUT Y1).



3. Type AND X1, and then press Enter key.

As the figure is shown below, the new instruction AND X1 is inserted into the row between instruction OR M0 and MOV D1 D2.

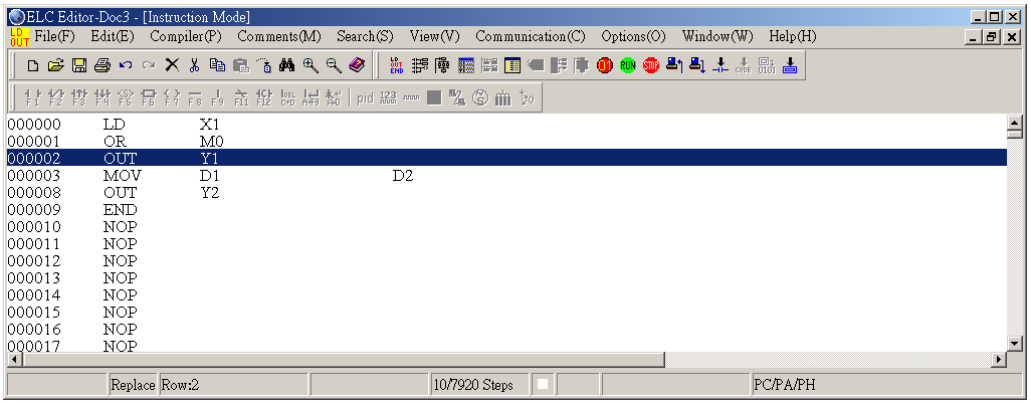




If the “Insert” word is displayed on the status bar, pressing the Insert key on the keyboard could switch to the Replace mode.

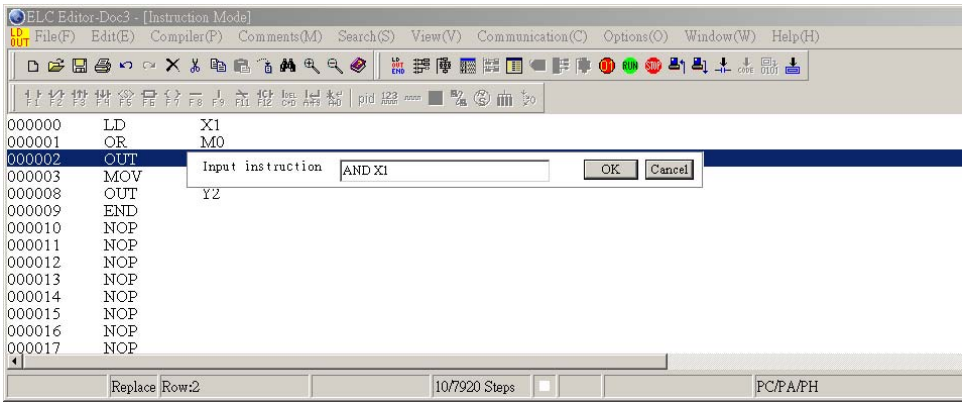
1. Enter the Replace Mode, and if the following program has already existed:

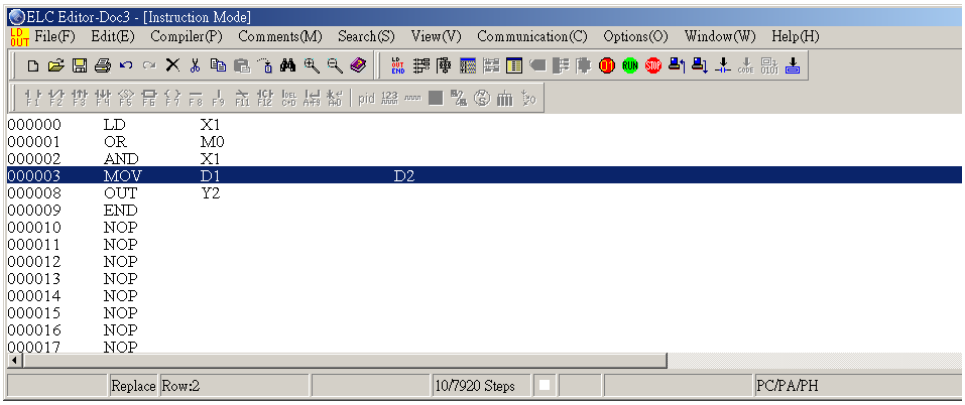
2. Move the blue highlighted editing row to the position of STEP 00002 (OUT Y1).



3. Type AND X1, and then press Enter key.

As the figure is shown below, the OUT Y1 is replaced with the new instruction AND X1.





Editing

- Undo: Undo an action you perform. (ELCSoft allows you can undo 10 times maximum)

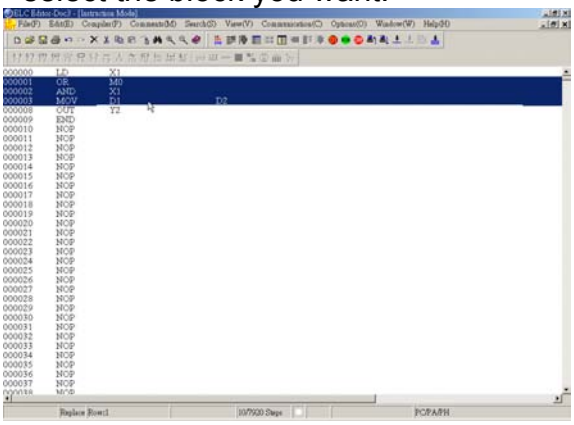
  ◈ Method 1: Click “Edit” > “Undo”.

  ◈ Method 2: Click the icon  on toolbar.

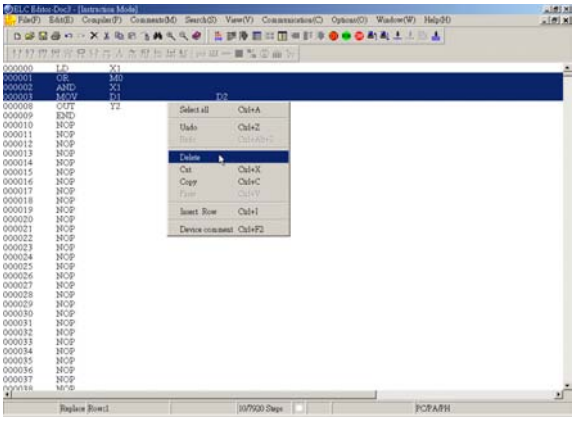
  ◈ Method 3: Use keyboard shortcuts by pressing keys (Ctrl) + (Z).

  ◈ Method 4: Right click the mouse and select the “Undo” command in the pop-up menu.

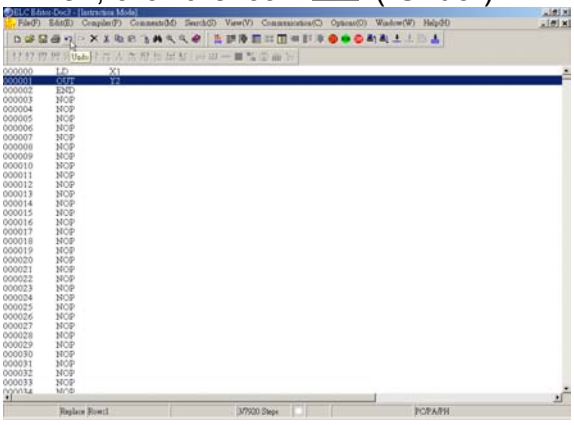
1. Select Block: drag the cursor to select the block you want.



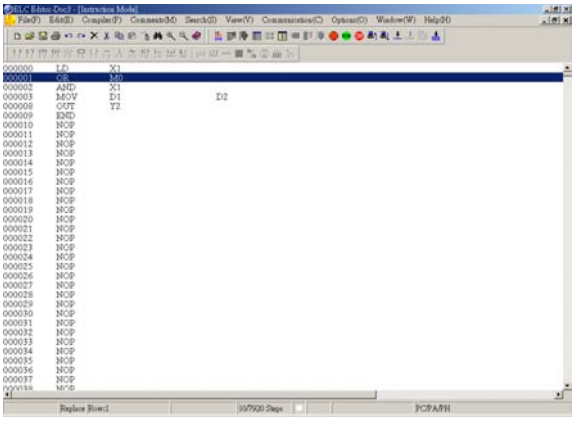
2. Delete the selected block.



3. After delete the block, the programs listed below the block will move up. Then, click the icon  (“Undo”).



4. It will return to its previous status (the most recent action).

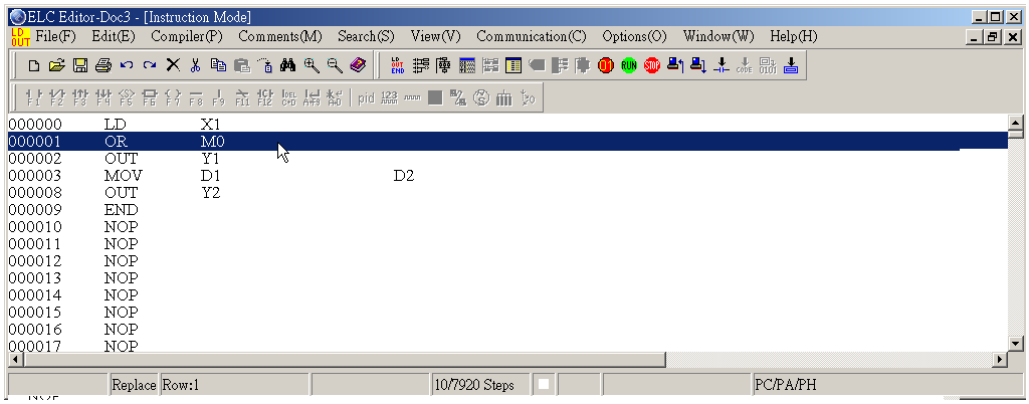


- Redo: Redo an action. If you don't like the result of undoing an action, you can redo it.
  - ◈ Method 1: Click "Edit" > "Redo". If you click "Redo" after an Undo action, it can return to the last action before you undo it.
  - ◈ Method 2: Click the icon  on toolbar
  - ◈ Method 3: Use keyboard shortcuts by pressing keys (Ctrl) + (Alt) + (Z)
  - ◈ Method 4: Right click the mouse and select the "Redo" command in the pop-up menu

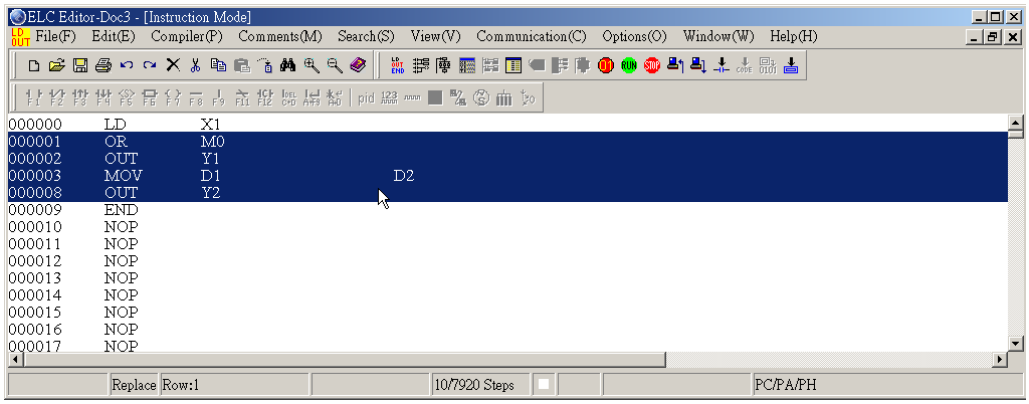
- Select Block

To select block that you want, point to where you want to start selecting the block, and drag to where you want it to end by your mouse.

1. Use your mouse to point to where you want to start selecting the block.



2. Drag to where you want it to end.

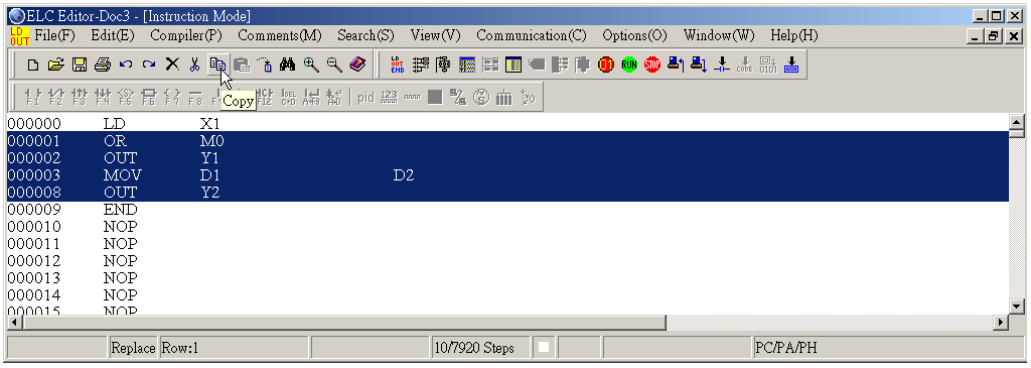


The above blue highlighted area is thus the "Selected Block".

- Copy Block: Copy the selected block

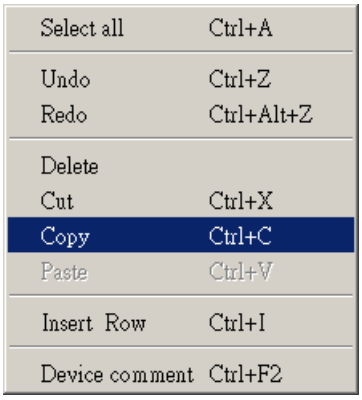
  ◈ Method 1: Click “Edit” > “Copy”

  ◈ Method 2: Click the icon  on toolbar



  ◈ Method 3: Use keyboard shortcuts by pressing keys (Ctrl) + (C)

  ◈ Method 4: Right click the mouse to select the “Copy” command in the pop-up menu



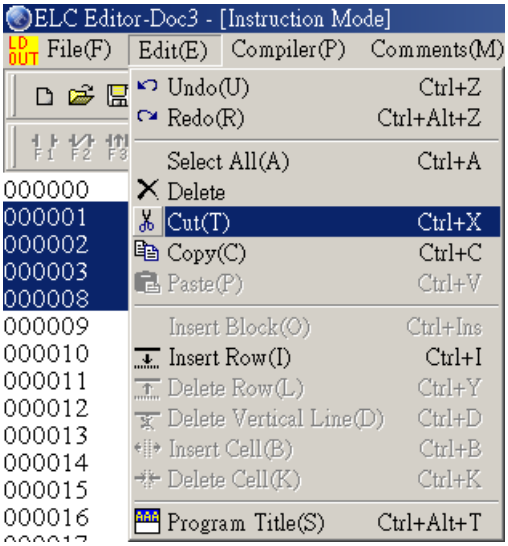
- Cut Block: Cut the selected block

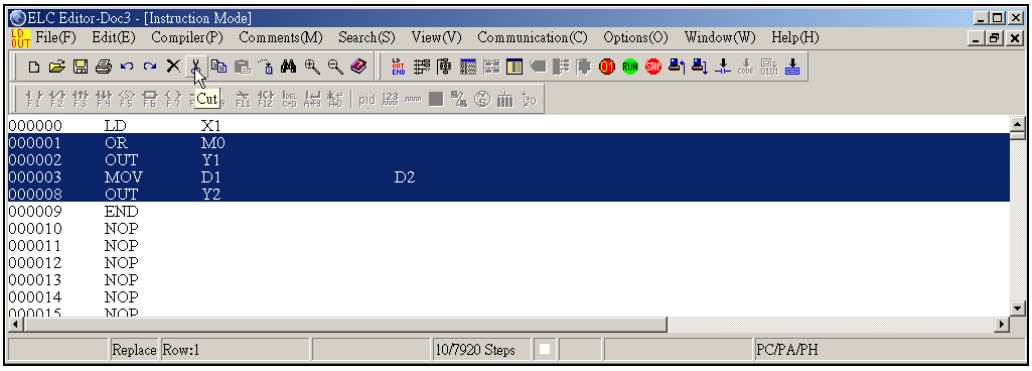
  ◈ Method 1: Click “Edit” > “Cut”

  ◈ Method 2: Click the icon  on toolbar

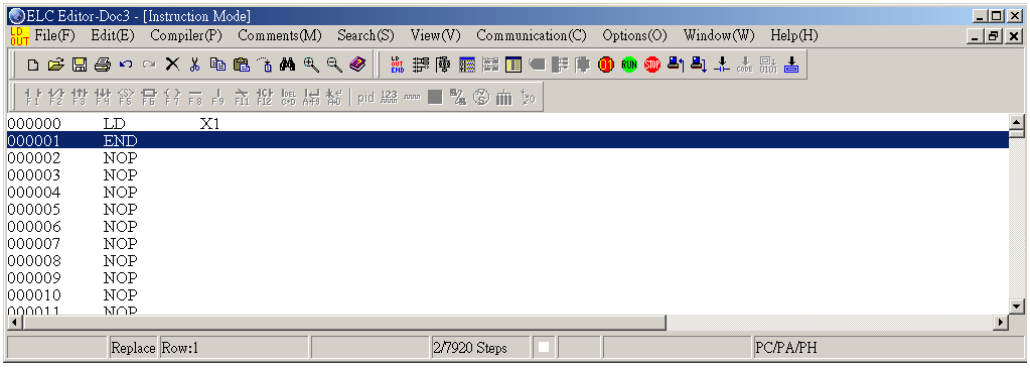
  ◈ Method 3: Use keyboard shortcuts by pressing keys (Ctrl) + (X)

◈ Method 4: Right click the mouse and select the “Cut” command in the pop-up menu





The selected block is cut.



■ Delete Block: Delete the selected block

◈ Method 1: Click “Edit” > “Delete”

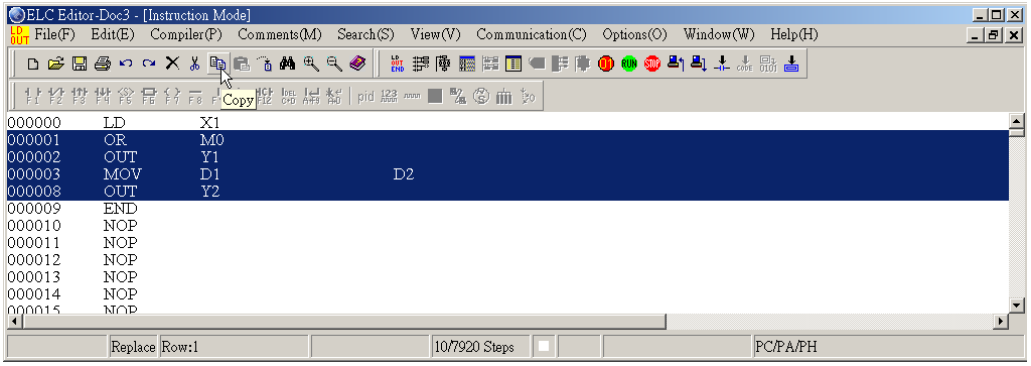
◈ Method 2: Press the Delete key on the keyboard.

◈ Method 3: Right click the mouse to select the “Delete” command in the pop-up menu.

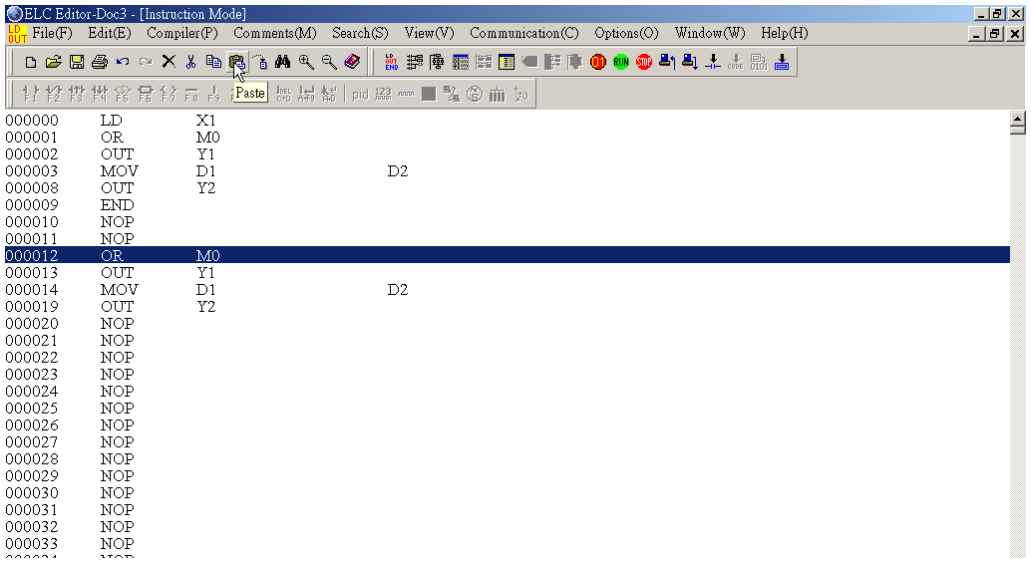
◈ Method 4: Click the icon  on toolbar

■ Paste Block: Paste the selected block

1. Copy the block (refer to the copy methods mentioned on page 5-7 and 5-8) -> Move the copied block (blue highlighted block) to where you want to insert or paste -> Click the icon  on toolbar. No matter you are editing in the Insert mode or Replace mode, the original content will move down when the copy block (blue highlighted block) is inserted or pasted.



2. The blue highlighted block is in the position of 00012. After “Paste Block” action is performed, the previously selected block will be pasted in the position of 00012.

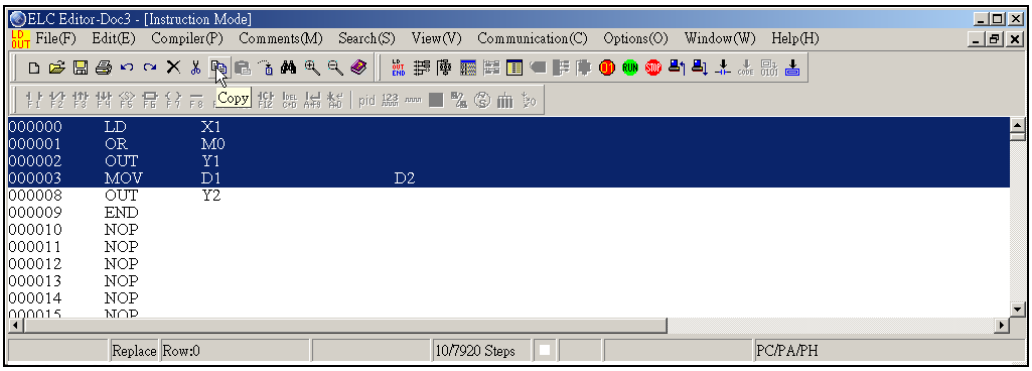


■ Copy between Files

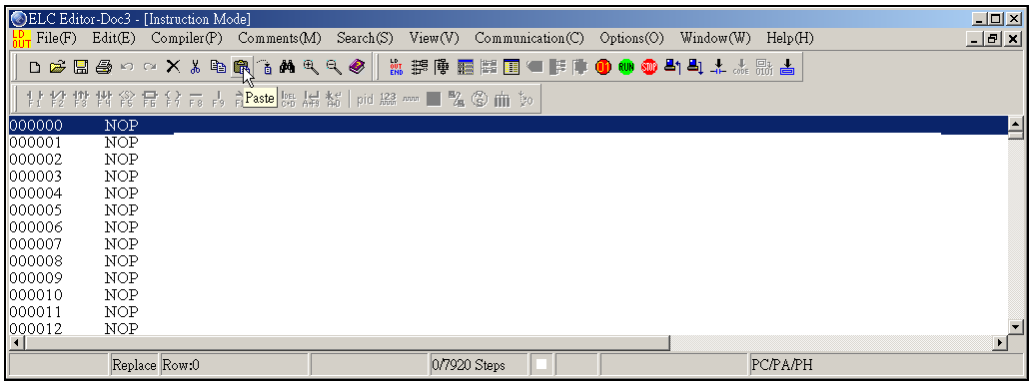
If user wants to edit two or more than two ELC programs at the same time, simply execute ELCSoft for two or more than two times, and then user could edit different ELC programs in different ELCSoft editor windows simultaneously.

ELCSoft allows user can perform “Copy Block” action from one file to another file. This copy function can be used in ladder diagram mode (please refer to Section 4.4) and instruction mode only. Users can copy the selected block in the instruction mode of one file (the first ELCSoft window) and paste it onto the instruction mode of another file (the second ELCSoft window.) In other word, users can perform copy and paste function between different files but their editing mode should be the same. Due to different editing environment, ELCSoft does not allow user to copy and paste the selected block in different files if their editing modes are not the same. Therefore, if user copy the selected block in the instruction mode of one file and paste them onto the ladder diagram mode of another file, the copied block will not be copied or pasted.

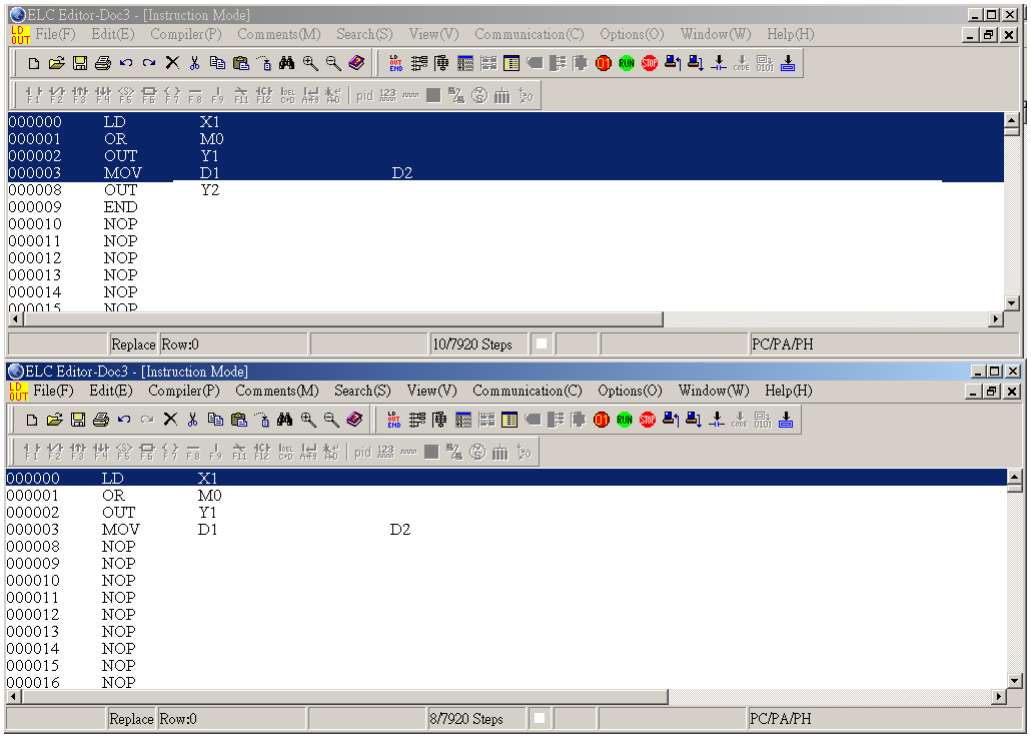
1. Copy the selected block from the instruction mode of the first ELCSoft window.



2. Paste the copied block onto the ladder diagram mode of the second ELCSoft window.

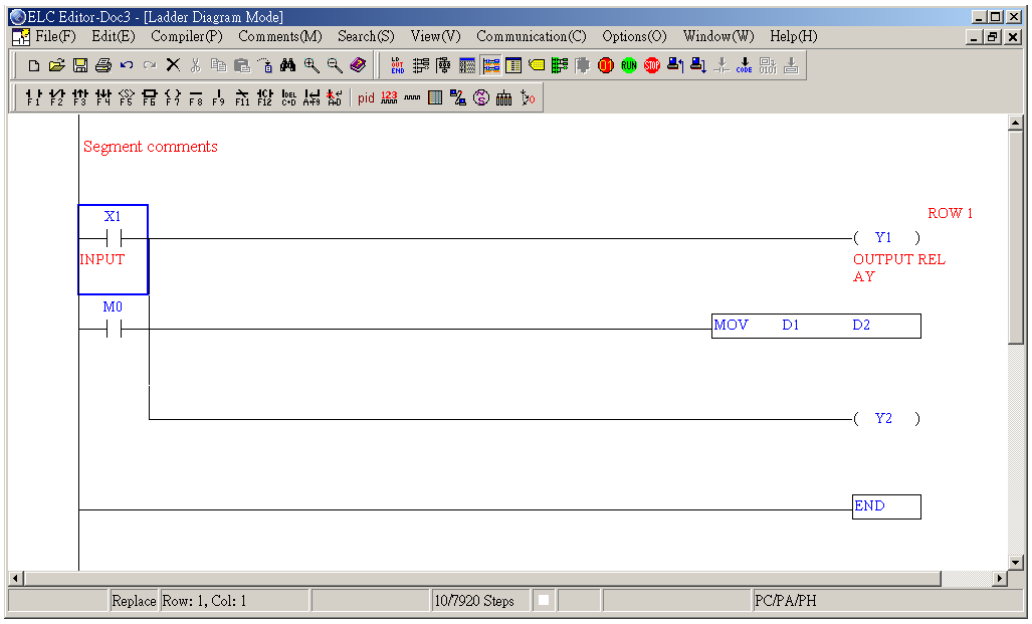


3. Copy between these two files is completed.



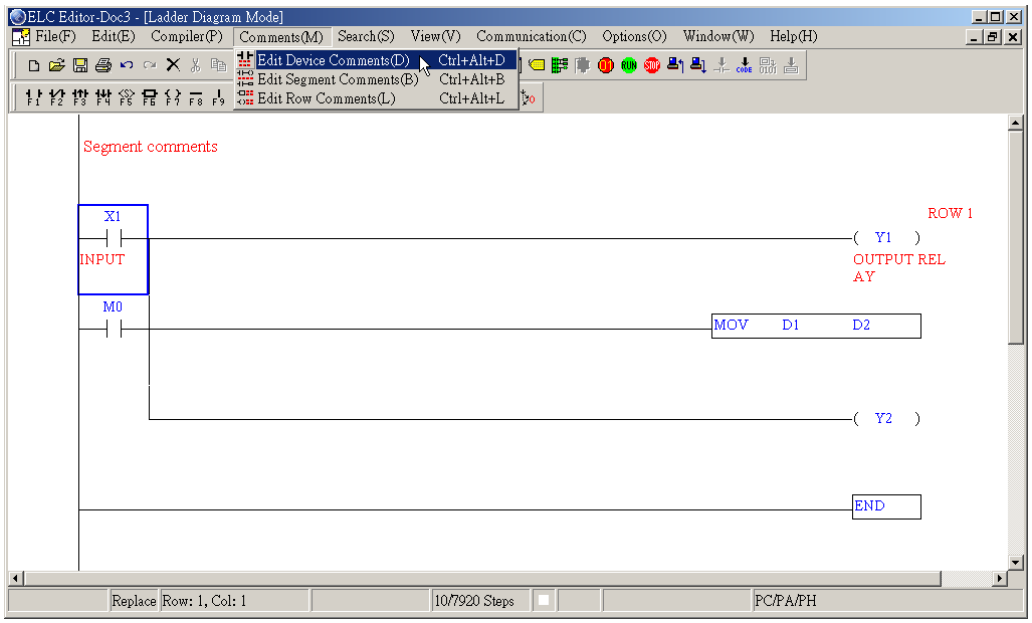
In the ladder diagram mode, there are three operating modes for editing comments: Device comments, Segment comments and Row comments. However, while within the SFC mode and instruction mode, only “Edit Device Comments” function is provided. Please refer to the following for more introductions on editing comments.

Ladder Diagram Mode:



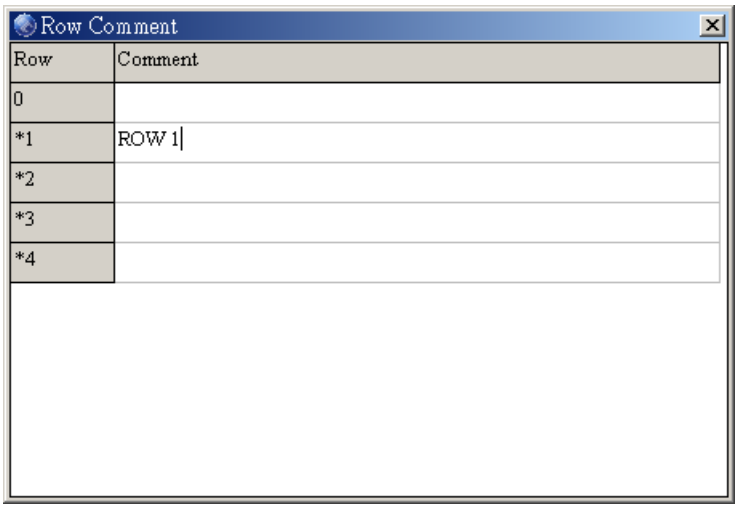
■ Edit Device Comments(D):

Move the editing block on the desired device and right click your mouse. The pop-up menu box shown on the above figure will appear. From this pop-up menu, choosing “Edit Device Comments” can enter and edit device comments. After the comments editing is completed, press “Enter” key on your keyboard or click the button “Close” by your mouse to have the record saved.



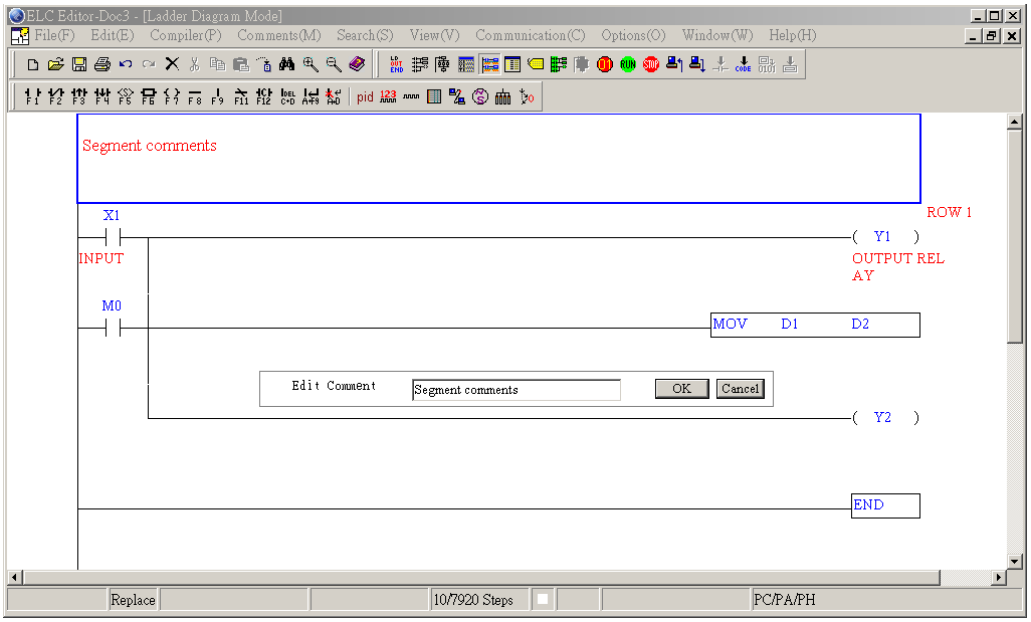
■ Edit Row Comments(L): (Only for ladder diagram mode)

Enable this function, and then you can edit all row comments at the same time.

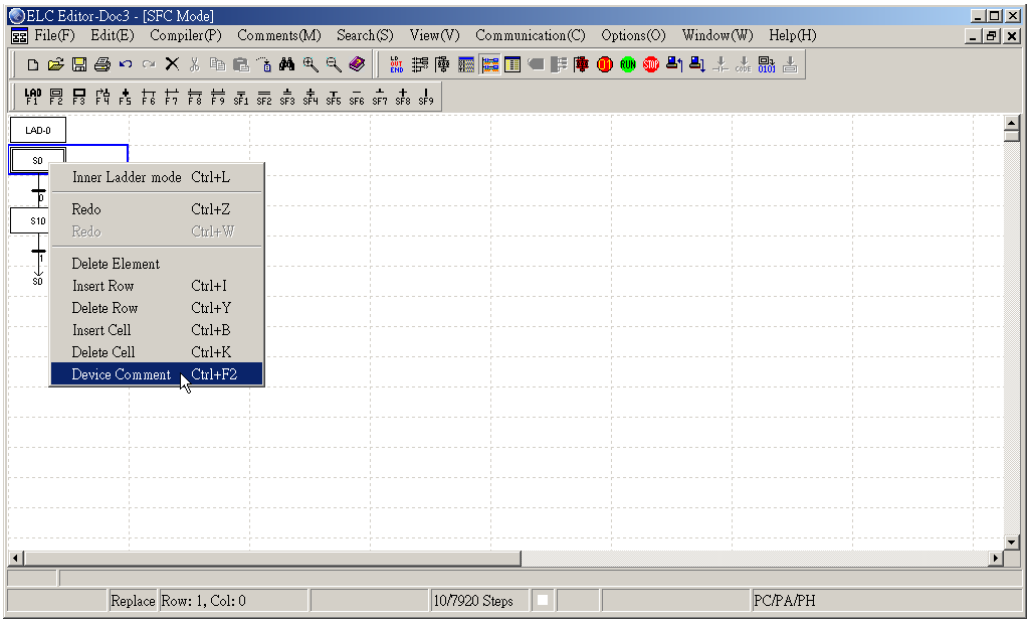


■ Edit Segment Comments(B): (Only for ladder diagram mode)

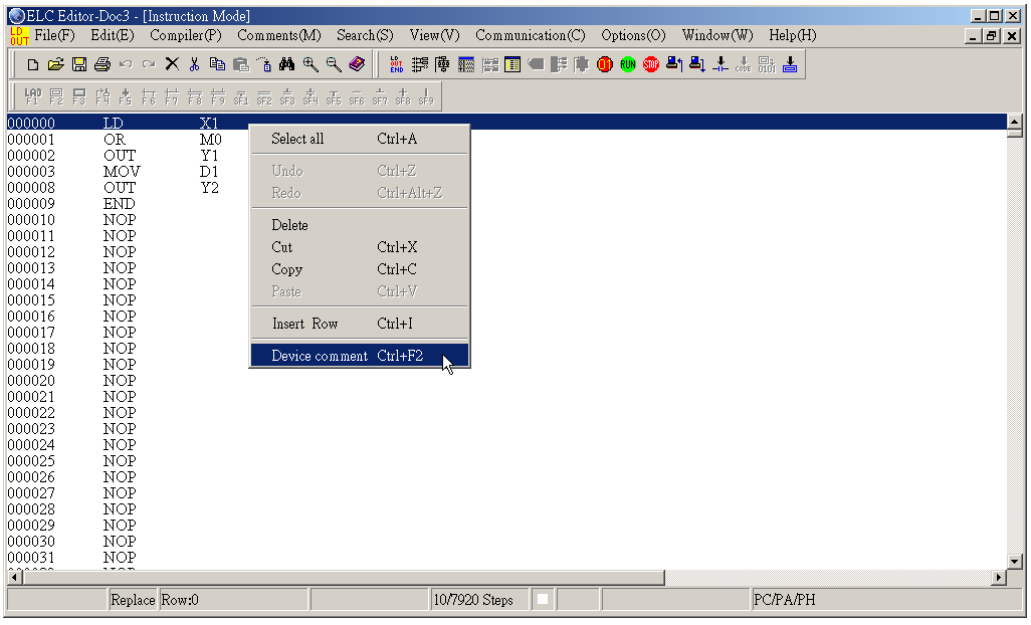
After the segment comments editing is completed, press the button “OK”.



SFC Mode: (only “Edit Device Comments” function is provided)



Instruction Mode: (only “Edit Device Comments” function is provided)

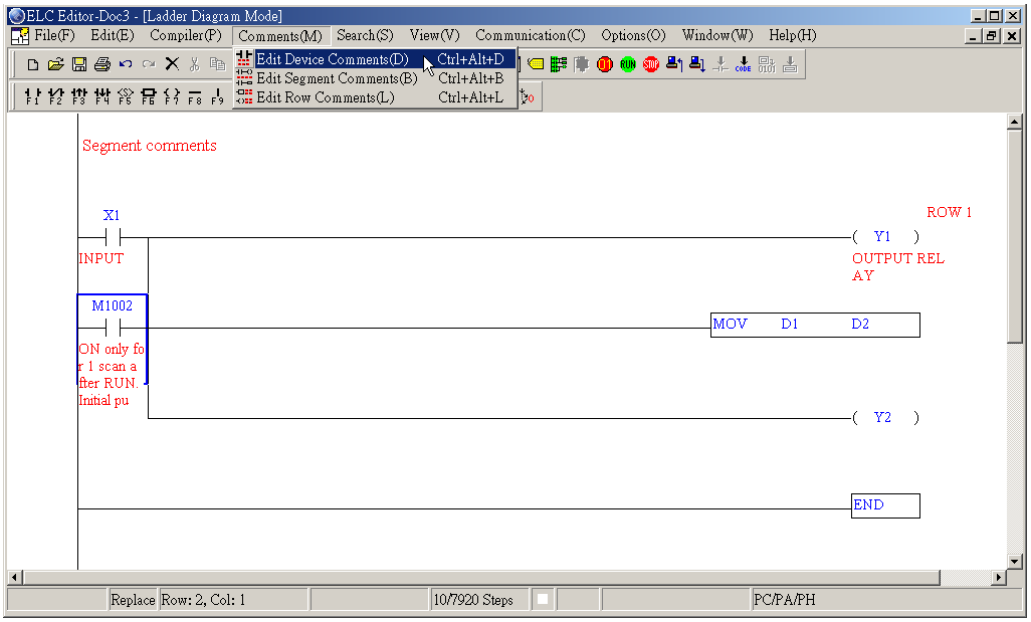


6.1 Edit Device Comments(D)

In the ladder diagram mode, Instruction mode and SFC mode, user can set the comments to be displayed in the device.

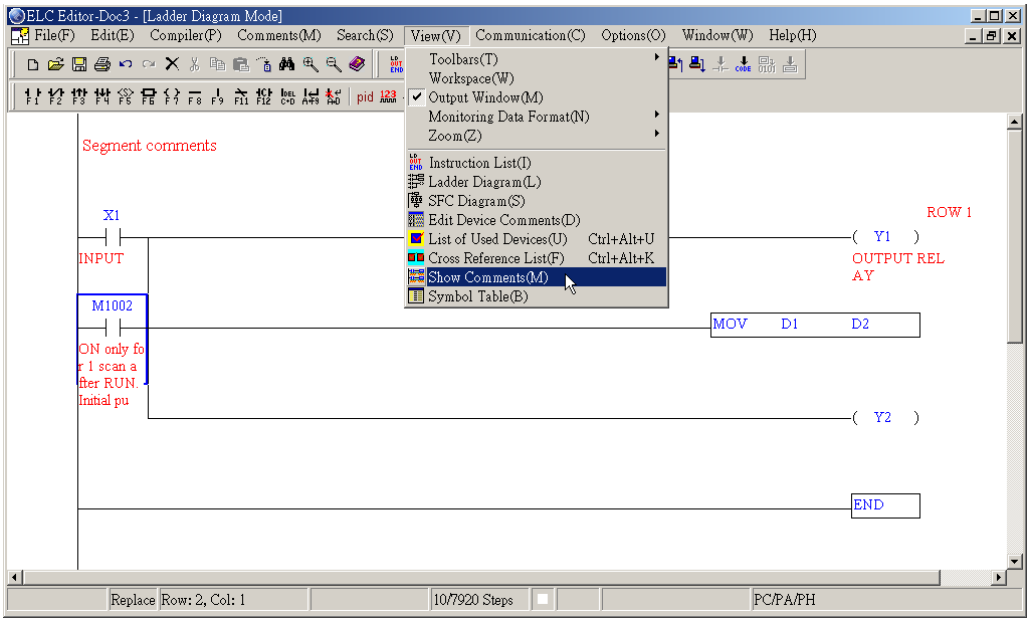
◈ Method 1:

1. First, choose to enter the ladder diagram mode (Instruction mode or SFC mode). Move the editing block on the desired device. From the “Comments” menu, choose “Edit Device Comments(D)” or use keyboard shortcuts by pressing keys (Ctrl) + (Alt) + (D).



2. The Comment dialog box will appear and you can edit comments for the desired device you choose, e.g. M1002 (If the device you choose is the special M and D device of ELC, you will see the preset comments shown in the Comment dialog box). After the device comments editing is completed, press “Enter” key on your keyboard or click the button “Close” by your mouse.

3. If you want to display or hide device comments in the ladder diagram mode, click "  " on toolbar or choose "Show Comments(M)" from "View" menu.



◈ Method 2:

1. Choose to enter the ladder diagram mode (Instruction mode or SFC mode). Move the editing block on the desired device (such as MOV D1 D2). Right click your mouse and then the following pop-up menu will appear on the screen.

In Ladder Diagram Mode:

Undo	Ctrl+Z
Redo	Ctrl+Alt+Z
Delete	
Cut	Ctrl+X
Copy	Ctrl+C
Paste	Ctrl+V
Insert Block	Ctrl+Ins
Insert Row	Ctrl+I
Delete Row	Ctrl+Y
Delete Vertical Line	Ctrl+D
Edit Device Comments	Ctrl+Alt+D
Edit Segment Comments	Ctrl+Alt+S
Edit Row Comments	Ctrl+Alt+L

In SFC Mode:

Inner Ladder mode	Ctrl+L
Redo	Ctrl+Z
Redo	Ctrl+W
Delete Element	
Insert Row	Ctrl+I
Delete Row	Ctrl+Y
Insert Cell	Ctrl+B
Delete Cell	Ctrl+K
Device Comment	Ctrl+F2

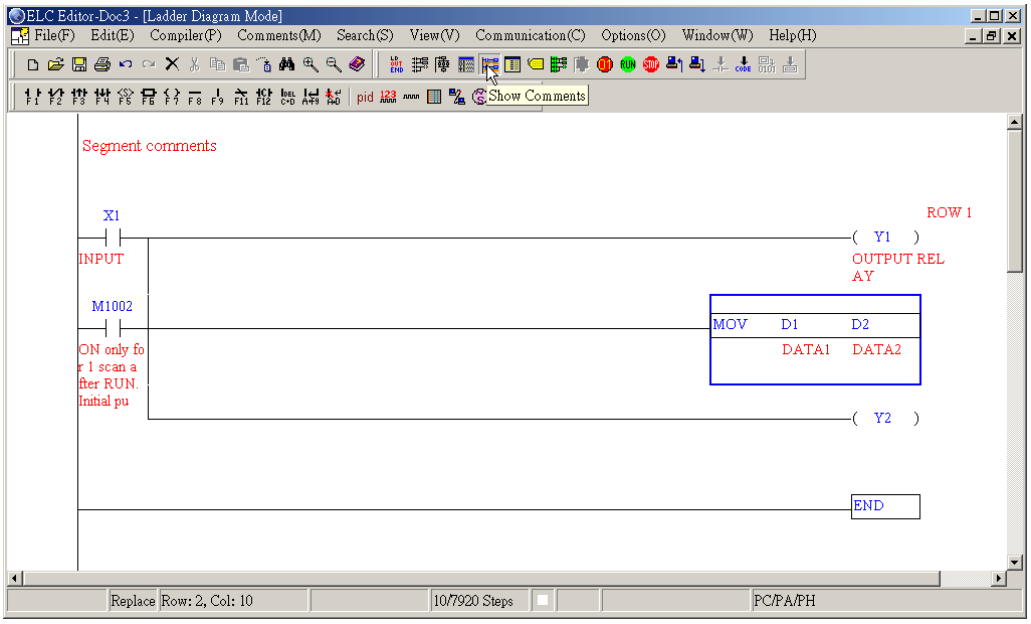
In Instruction Mode:

Select all	Ctrl+A
Undo	Ctrl+Z
Redo	Ctrl+Alt+Z
Delete	
Cut	Ctrl+X
Copy	Ctrl+C
Paste	Ctrl+V
Insert Row	Ctrl+I
Device comment	Ctrl+F2

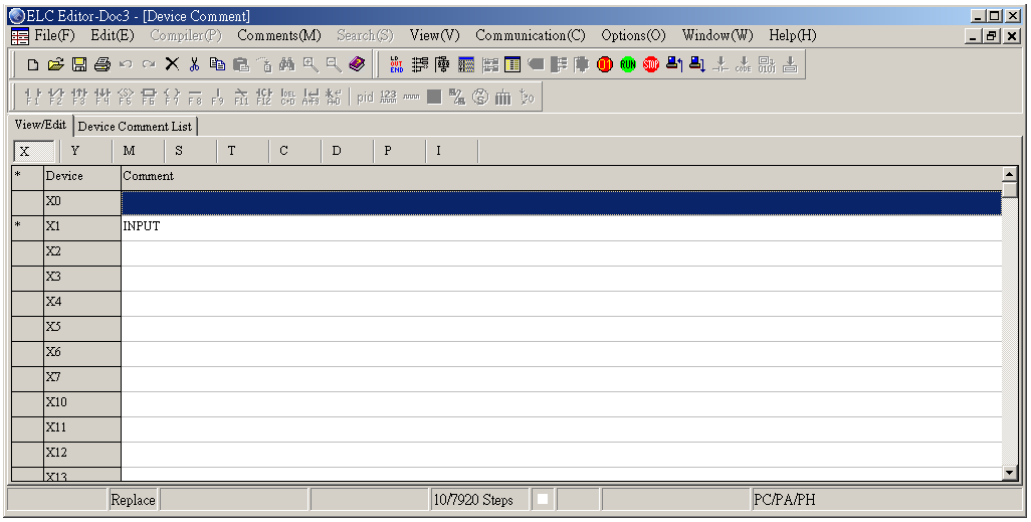
2. Choose “Edit Device Comments” from the pop-up menu, and the Comment dialog box will appear (see the figure below). Select the desired device, e.g. D2 and enter the comments for DATA 2. After the comments editing is completed, press “Enter” key on your keyboard or click the button “Close” by your mouse.

◈ Method 3:

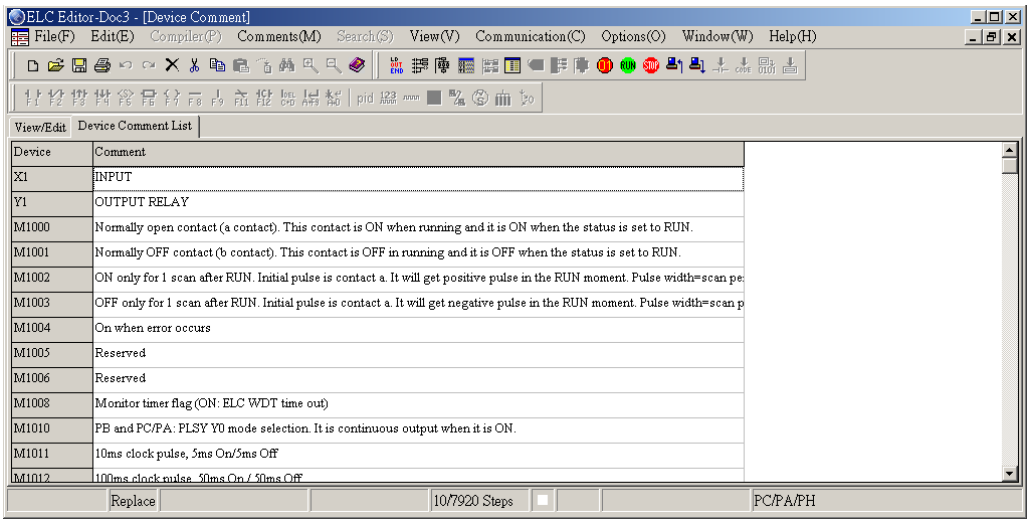
1. Choose to enter the ladder diagram mode (Instruction mode or SFC mode). Move the editing block on the desired device. Then, choose “Show Comments(M)” from “View” menu or click “  ” on toolbar by your mouse.



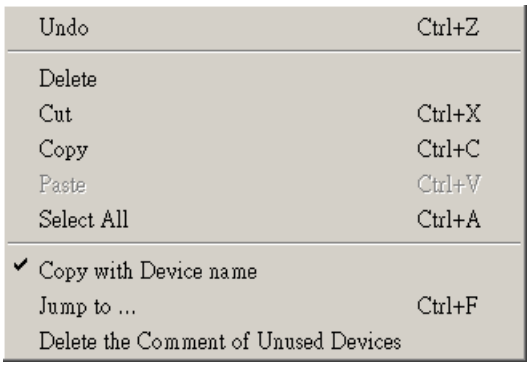
2. Click “View” > “Edit Device Comments” to choose the device type, e.g. X. If the device comments are already edited, you will see a “*” symbol marked in front of the device.



3. Click on the “Device Comment List” tab, and you can view all devices which their device comments are already edited.



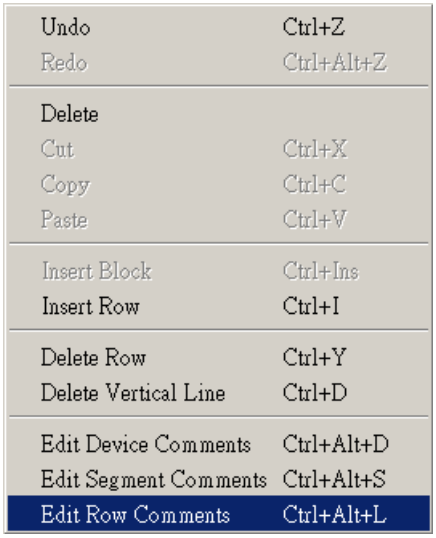
4. Right click your mouse, the following pop-up menu will appear. ELCSoft allows users to copy the selected comments and paste them on a Microsoft Excel sheet that can be used to create and edit the technical documents of customer's system. Also, ELCSoft allows users to copy the data from a Microsoft Excel sheet and paste them on the device comments editing area.



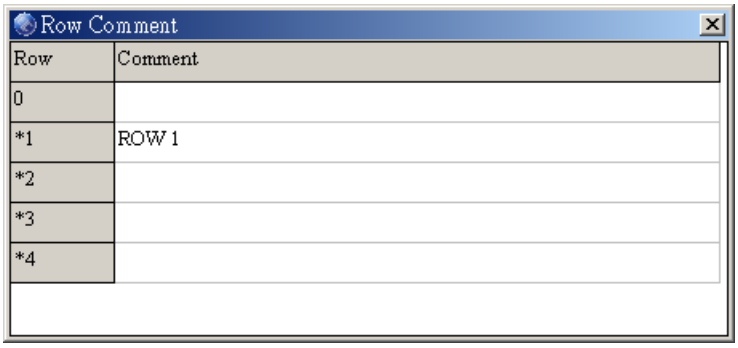
6.2 Edit Row Comments(L)

◈ Method 1:

1. Move the editing block to the desired row. Right click your mouse and the pop-up menu below will appear. Click on "Edit Row Comments" to add and edit comments into the row.

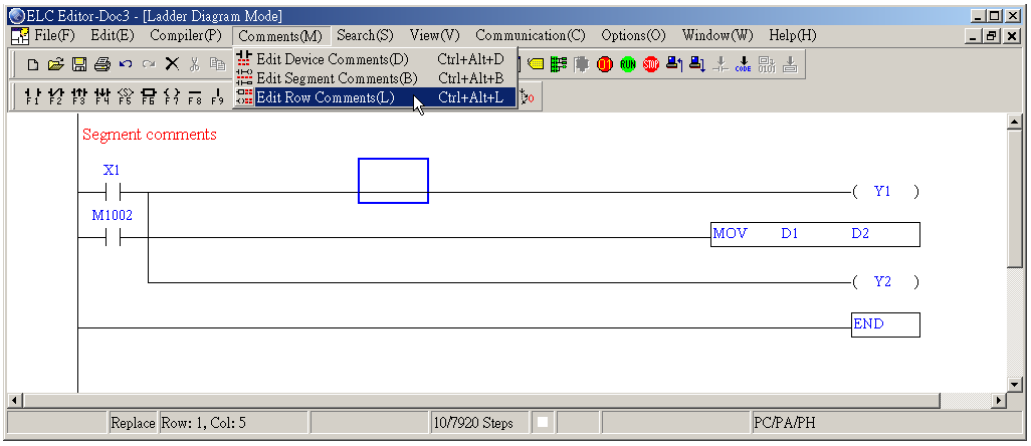


2. After clicking on “Edit Row Comments”, the following dialog box will appear. Then, users can add and edit several row comments at the same time. After the comments editing is completed, close this dialog box to save the edited comments.



◈ Method 2:

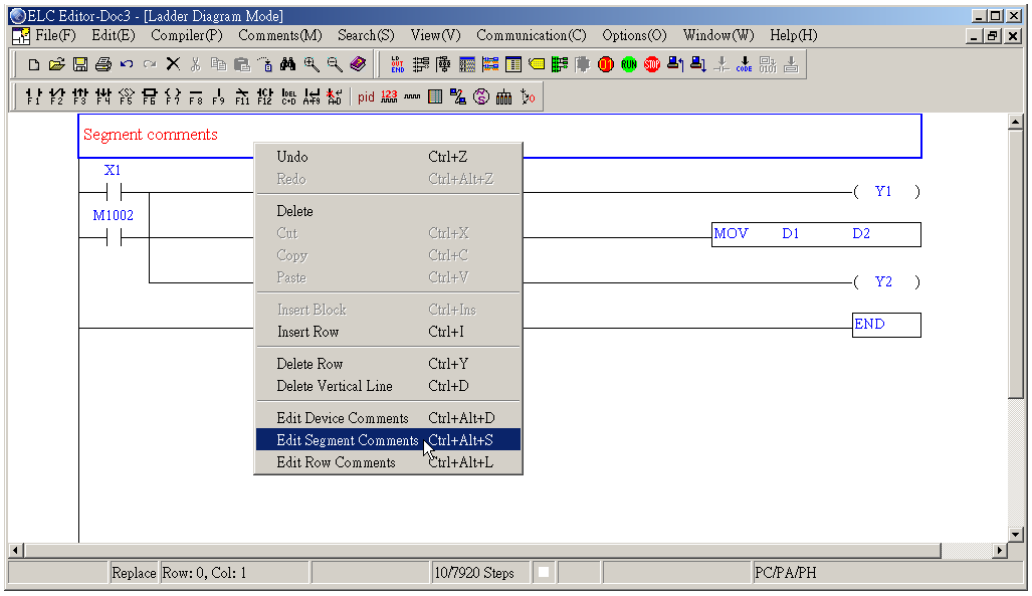
Move the editing block on the desired device. From “Comments” menu, choose “Edit Row comments(L)” or use keyboard shortcuts by pressing keys (Ctrl) + (Alt) + (L). The “Row comment” dialog box will appear. Then, users can enter the comments in each row. After the row comments editing is completed, close this dialog box to save the edited comments.

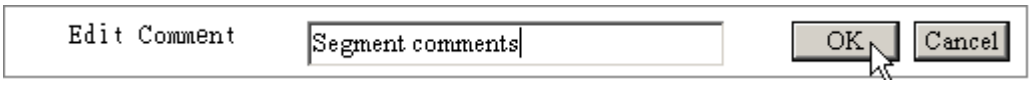


6.3 Segment Comments(B)

◈ Method 1:

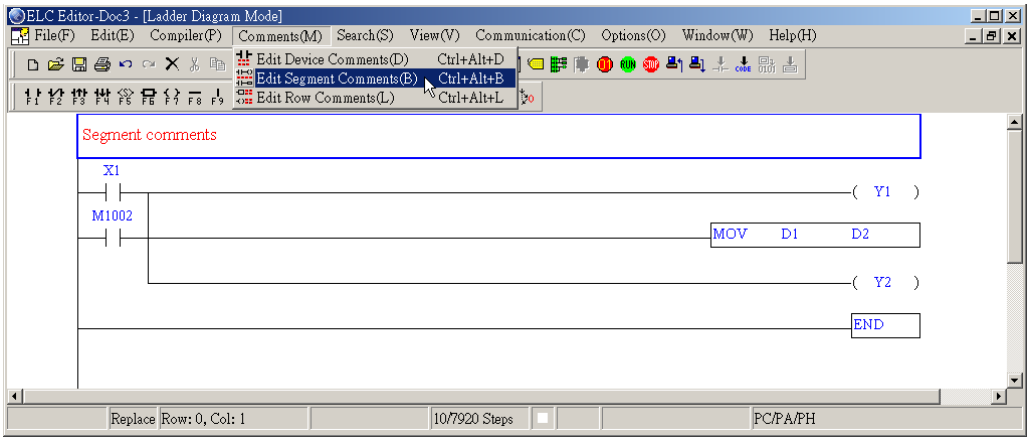
Move the editing block to the blank area that you want to enter the segment comments (you also can use keyboard shortcuts by pressing keys (Ctrl) + (I) to insert a new row). Right click your mouse, and the pop-up menu below will appear. Then, choose “Edit Segment Comments” to enter the segment comments (60 characters maximum). Finally, press the button “OK” to complete the editing.





◈ Method 2:

Click “Comment” from the menu bar, and choose “Edit Segment Comments(B)” or use keyboard shortcuts by pressing keys (Ctrl) + (Alt) + (S) to enter and edit the segment comments.



■ Show or Hide Comments

User can show and hide the comment by clicking “View” > “Show Comments(M)” or clicking the icon  on toolbar. However, this function is provided for device comments and row comments only. Users cannot show and hide segment comments by using this function. When this function is enabled, the height of the ladder diagram will become higher in order to display the comments.

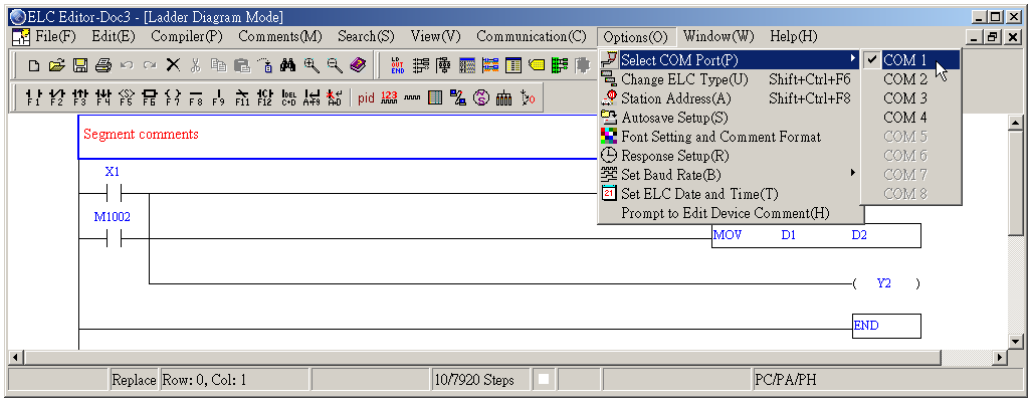
Before proceeding with the communication connection, please make sure that PC COM port and ELC communication port has finished connection setting. (the connection has been constructed between the RS232 communication port of PC and the communication port of ELC) ELCSoft provides various operation and control tools, such as device monitor, read/write register data to ELC, modem connection, communication setting, etc. It is convenient for you to edit, monitor or test by ELCSoft.

7.1 Data Transmission

- COM port setting

1. Before transmitting between ELCSoft and ELC, make sure that the PC and the ELC have completed the connection setting.

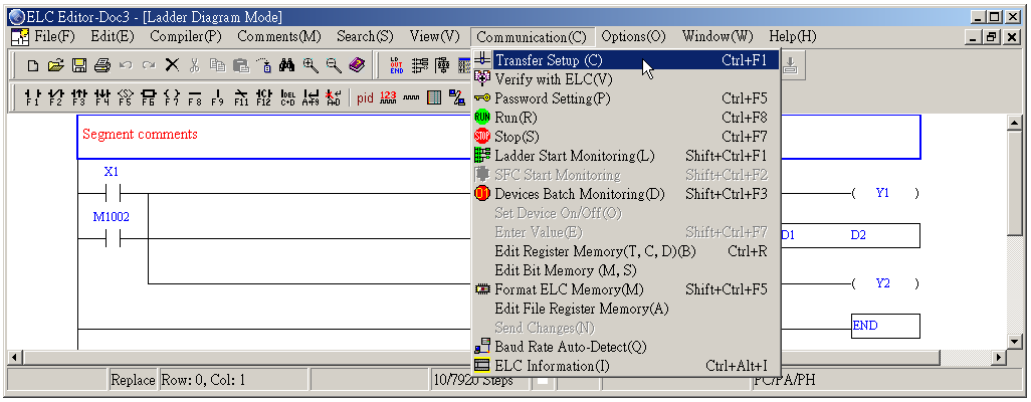
2. Click “Options” > “Select COM Port(P)” to select COM port (COM port number is from 1 to 8 and the COM port in relief cannot be selected (as shown below).



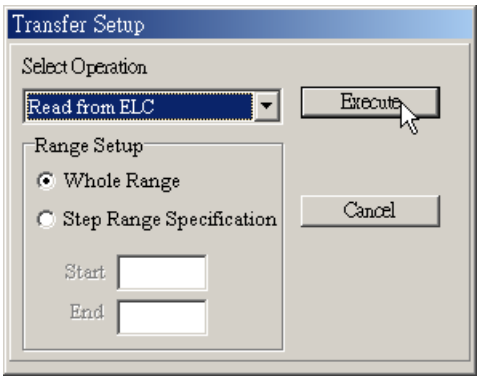
■ Read ELC

When reading the ELC program after completing communication setting, the procedure is as follows:

1. Click “Communication” > “Transfer Setup(C)” or click icon on toolbar or use keyboard shortcuts by pressing keys (Ctrl) + (F1).

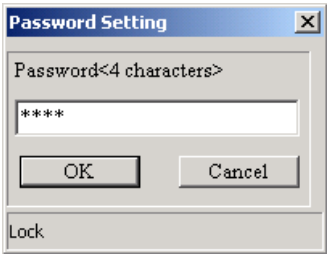


2. To read data from ELC, select “Read from ELC” under the “Select Operation” after the transfer setup dialog window appeared.



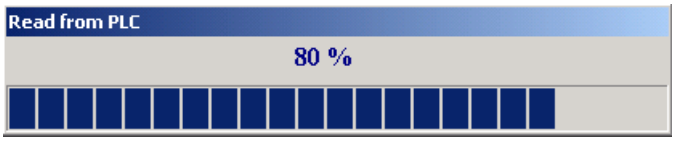
3. If there is password setting in ELC, it will show a password enter dialog box. It will only allow reading data from ELC once after entering correct password. Moreover, you will get the error message when entering the wrong password.

Step 1



Step 2

Step 3



4. There are two methods to read from ELC: read whole data and partial data.

   a. Whole data: If there are 3792 STEPs of ELC, such as PB models, 3792 STEPs data will be read completely.

   b. Partial data: it will only read the partial ELC program from the start to the first END. It is recommended to use this method to save communication time.

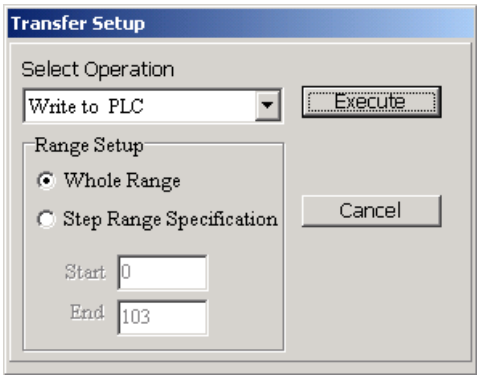
■ Write ELC

1. You can transmit a new program to ELC by clicking “Communication” > “Transfer Setup(C)” or click icon  on toolbar or using keyboard shortcuts by pressing keys (Ctrl) + (F1).

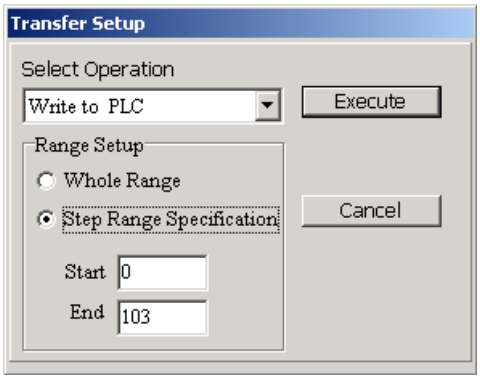
2. To write data from ELC, select “Write to ELC” under the “Select Operation” after the transfer setup dialog window appeared.
3. If there is password setting in ELC, it will show a password enter dialog box. It will only allow writing data once to ELC after entering correct password. Moreover, you will get the error message when entering the wrong password.

4. There are two methods to write to ELC: write whole data and partial data. (footnote 1)

a. Whole data: write whole data to the designated ELC. (as shown below)

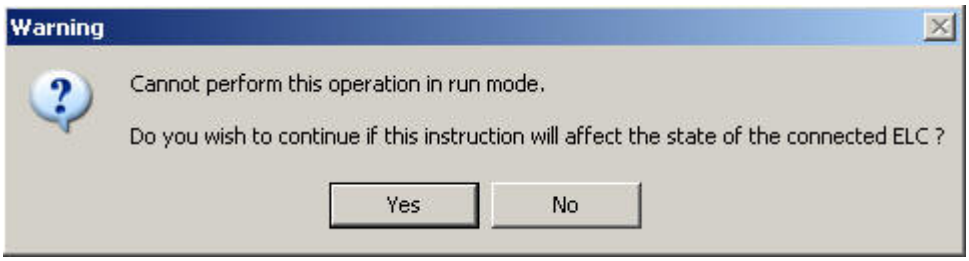


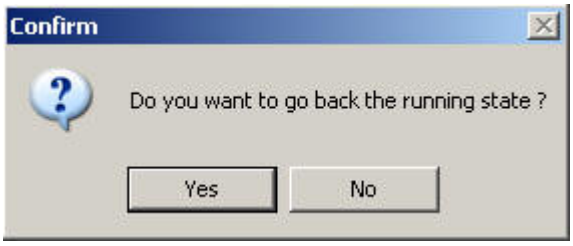
b. Partial data: you can set step range to write to ELC. If you select step range without setting start and end step. It will write the data from 0 step to the first end to ELC. (as shown below)



* footnote 1:

Before executing “write to ELC”, make sure that the ELC is in STOP mode, or if ELC is in RUN mode, ELCSoft will then send out a warning message of “Cannot perform this operation in run mode” “Do you wish to continues if this instruction will affect the state of the connect ELC ?”(as shown below). If choose "Yes", ELCSoft will stop ELC first and write program into ELC. After completing, it will inquire you to return to RUN status or not.

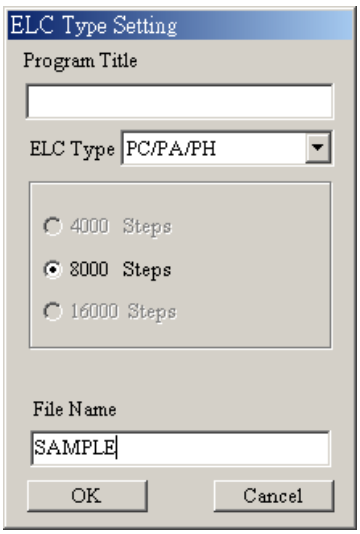




■ HHP and PC Communication

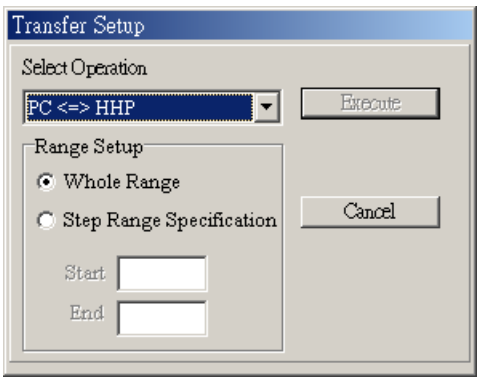
For the communication between PC and HHP, PC is the Slaver while the control power is held by HHP (which is the Master). First, connect HHP with PC first (the connection between the RS-232 communication port of PC and the communication port of HHP has been constructed, please refer to the HHP User Manual for the connection method). After clicking “File” > New” to get the new file, supply with the HHP power, and HHP is then at the (HHP→ PC) connection mode, and you could then READ/WRITE PC through the Menu.

1. When reading HHP program by ELCSoft, the procedure is the same as create new project needed to set connection model and program capacity as shown below.



2. After opening new file or need to transmit ELCSoft current program to HHP, the communication setting should set to “PC ⇔ HHP” by following methods. The transmission can be controlled from HHP.

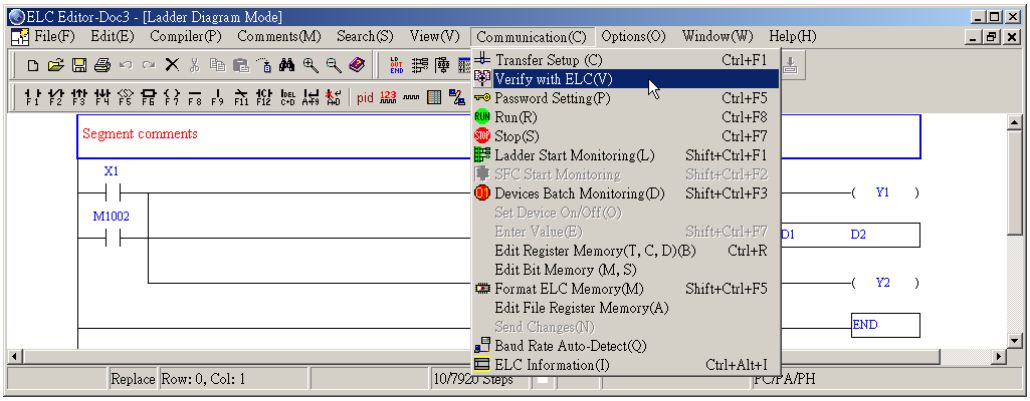
   a. Click “Communication” > “Transfer Setup(C)”



7.2 Verify with ELC

Use of this instruction could verify the ELC internal program and the PC editing program; the procedure is as follows: (as shown below)

1. Click “Communication” > “Verify with ELC(V)” to verify ELC program (ELC must be no password setting)



2. If the PC editing program is different from the ELC program, ELCSoft will thus send a warning message of “Verification error!!” (as shown below), and if these two programs are the same, ELCSoft will thus send a message of “Verification is finished!!” (as shown below).

The programs are different!

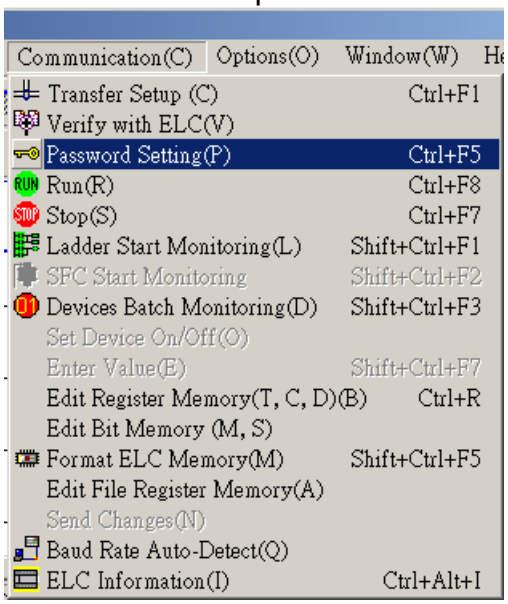
The programs are the same!

7.3 Password Setting

It is use to set up or decode the ELC read/write password.

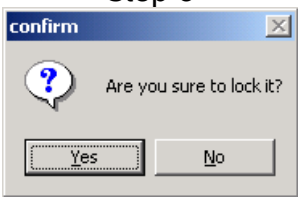
1. Enter password setting by clicking “Communication” > “password setting(P)” (as shown below), to input password for setting. It will show “ELC password is locked” in password dialog box.

Step 1



Step 2

Step 3



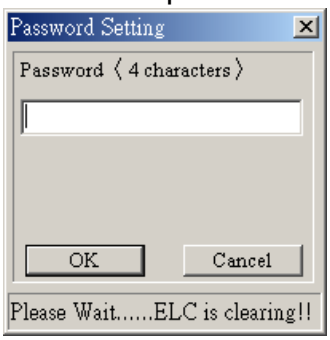
Step 4

Step 5

2. If the password is forgotten for PB models, press the [Space] bar four times, ELCSoft will then present a confirmation message of “ELC Program delete”, if “Yes” is chosen, the ELC program will be cleared, then the password will be decoded.

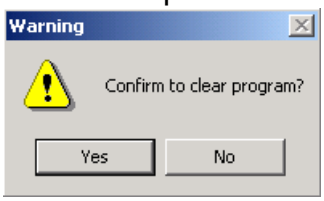
Step 1

Step 3

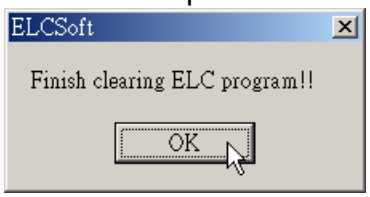


Step 5

Step 2



Step 4

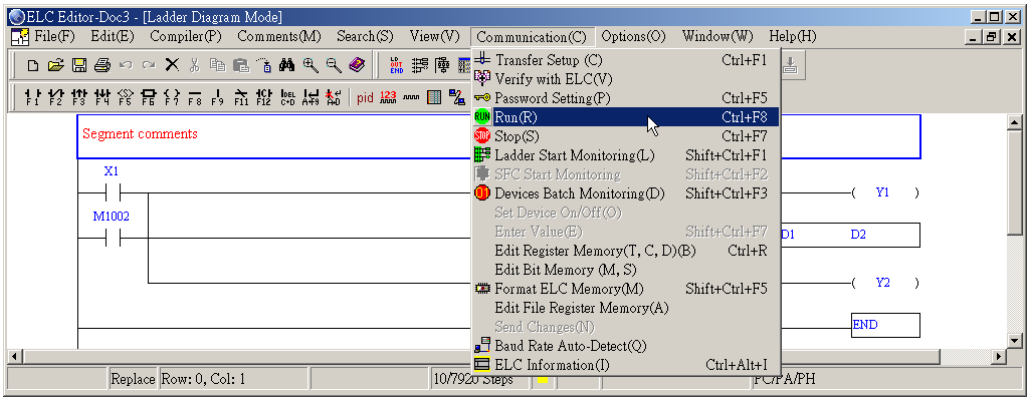


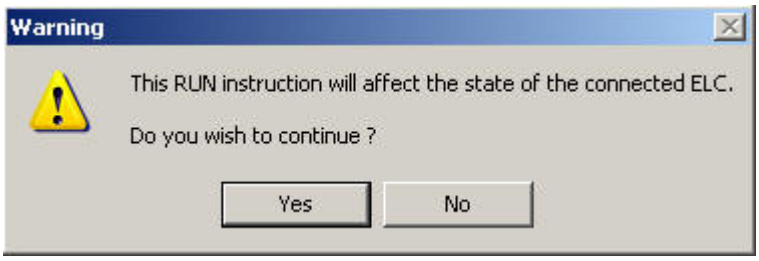
3. If the password is forgotten for PC/PA/PH models, please remove the battery for about 10 minutes and the ELC program will be cleared, then the password will be decoded, or use “Communication” > “Format ELC Memory(M)” to clear ELC internal memory or return to factory settings and then the password will be decoded

7.4 Run/Stop ELC

■ Run ELC

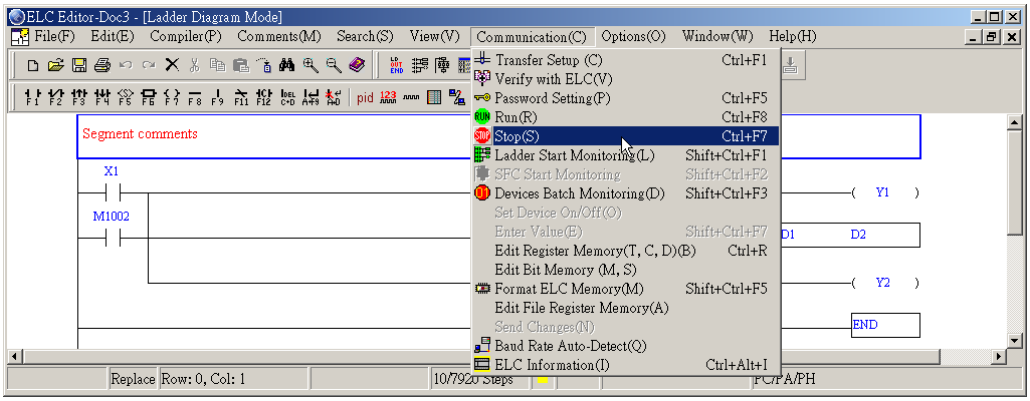
Click “Communication” > “Run” (as shown below), or use keyboard shortcuts by pressing keys (Ctrl) + (F5), or click on the icon  to get the dialog box, then press “Yes” to set the ELC at the RUN condition.

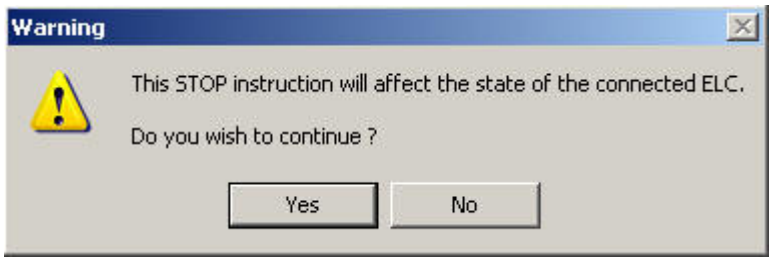




■ Stop ELC

Click “Communication” > “Stop” (as shown below), or use keyboard shortcuts by pressing keys (Ctrl) + (F7), or click on the icon  to get the dialog box, then press “Yes” to set the ELC at the STOP condition.

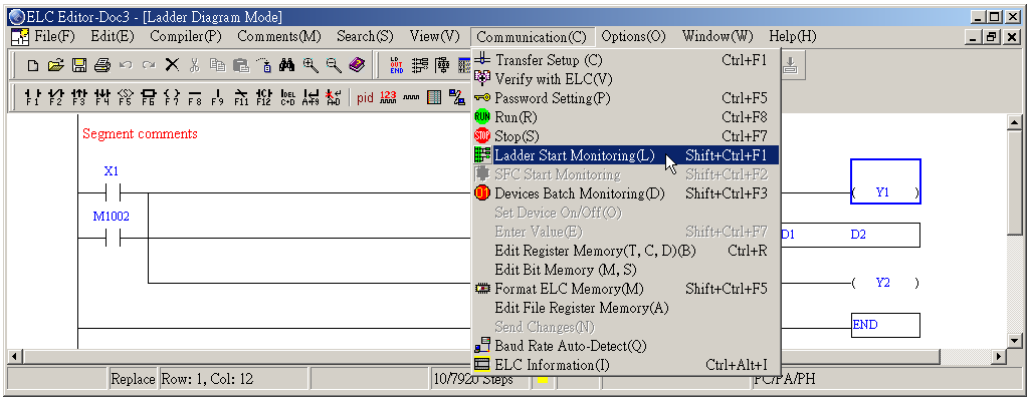




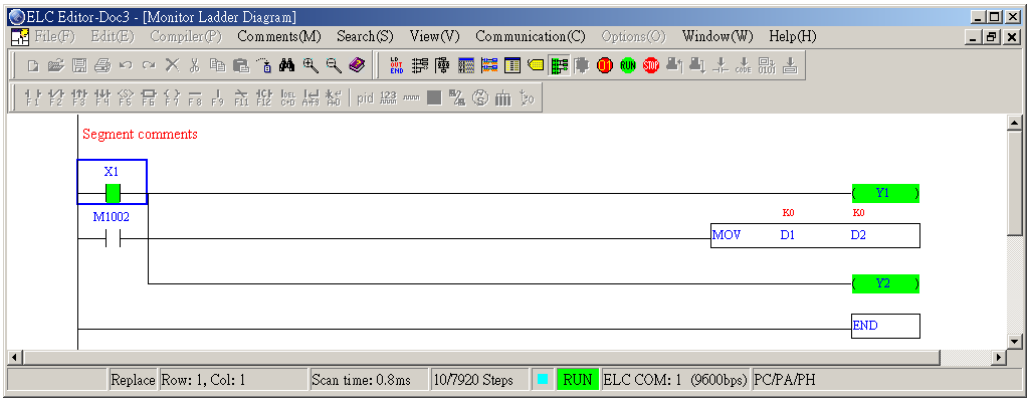
7.5 Ladder Start Monitoring

It is used to switch the ladder diagram mode to the ladder diagram monitor mode, and in the monitor mode, all the editing actions are banned. All the execution conditions of the program could be observed from the window, and usually, advantages will be accompanying the ladder diagram monitor mode in the program debug and the operation.

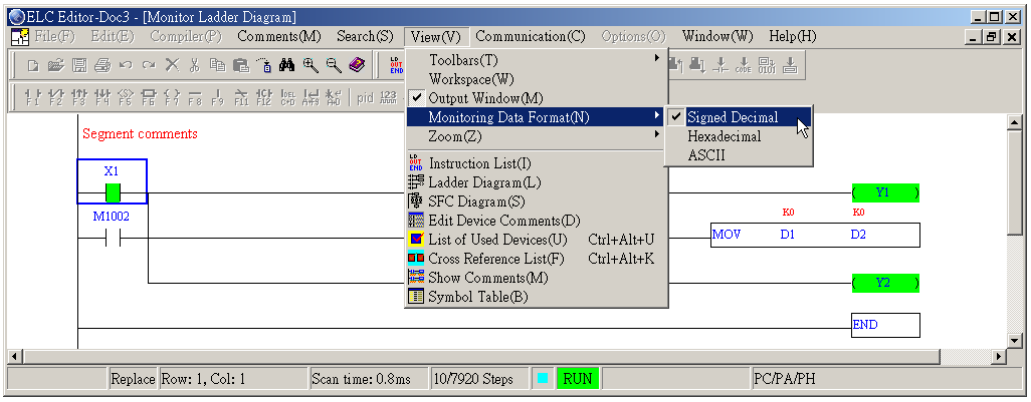
1. If you want to monitor the ELC status under the PC window, you should start monitor function by clicking “communication” > “ladder start monitoring” or click icon directly in ladder diagram mode (as shown below).



2. After starting monitor, the green portion displayed in the window is an indication that the contact is at the continuity status or the output coil is ON. On the contrary, if the green color does not display on the contact or the output coil, it means that this portion is currently OFF. Moreover, the current value (*Footnote 1) of the register will be shown on the upper part of the register (T, C, D) as shown below.



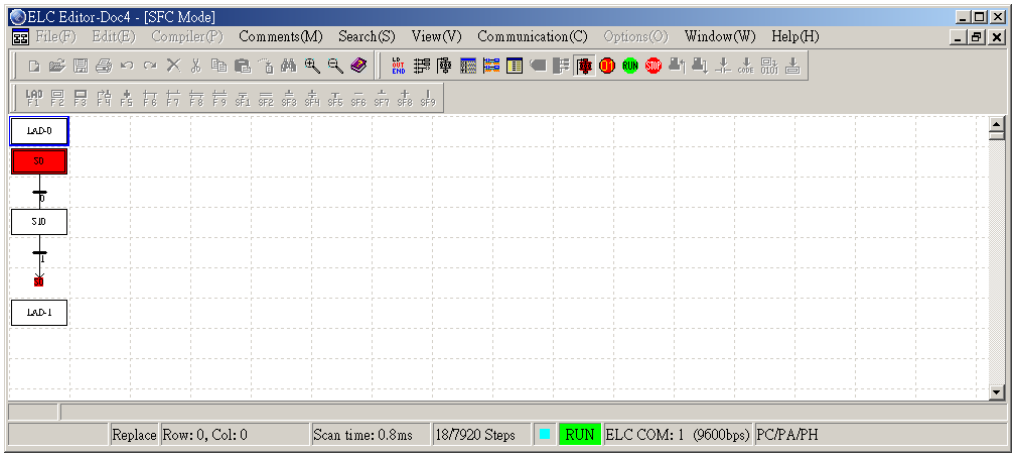
* Footnote 1: You could select number system of the Hexadecimal, the Decimal or the ASCII code system for display after clicking “View” > “Monitoring Data Format(N)”. In ladder diagram monitor mode, there will be a letter represented in the front of number to distinguish the number system. For signed decimal system, it is K, such as K1234, and H for hexadecimal system, such as HABCD. If it is ASCII code, the figure has to be the ASCII code for display, otherwise, it will be “ * ”.



7.6 SFC Monitor

It is used to switch the SFC diagram mode to the SFC diagram monitor mode, and in the monitor mode, all the editing actions are banned. All the execution conditions of the program could be observed from the window, and usually, you can know current execution status from SFC diagram monitor mode.

1. You can monitor by clicking icon  on tool bar or “communication” > “SFC Start Monitoring”.

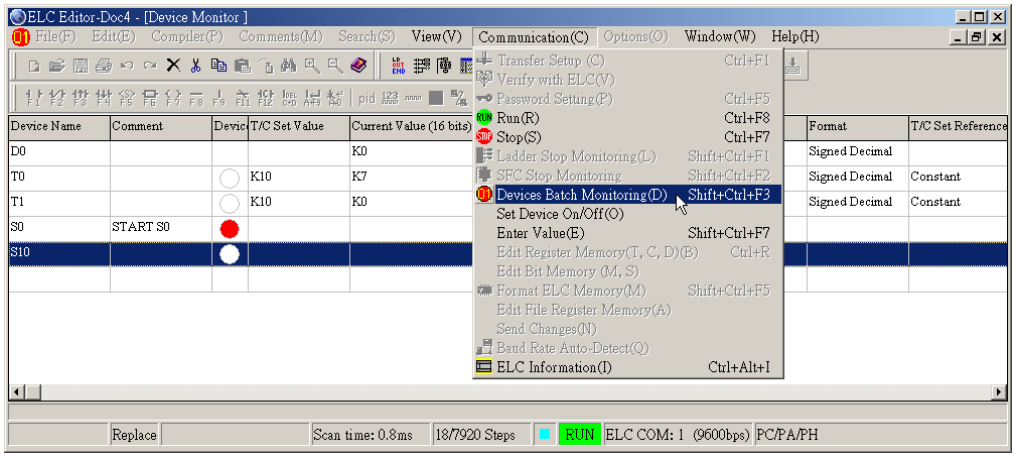


2. The red light of step points S0 above means that the step point is currently “ON” and is running the internal program.

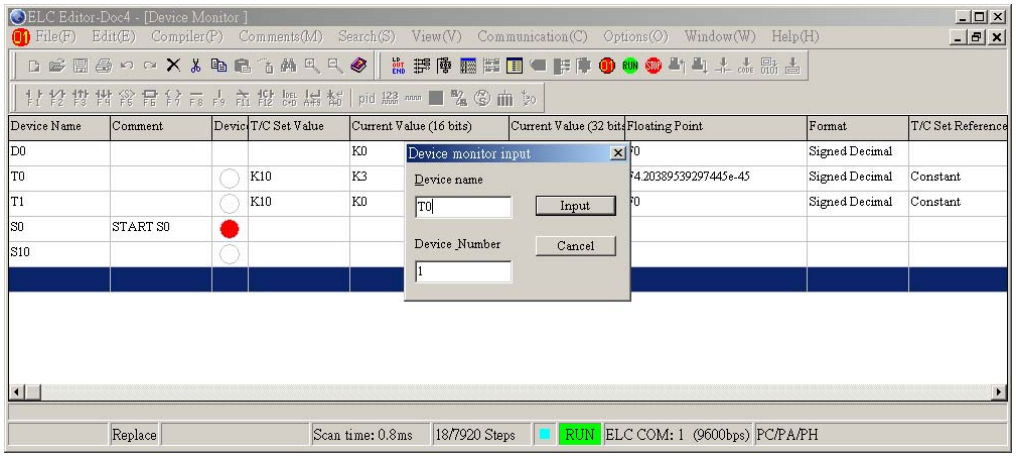
7.7 Device Monitor

Device monitor could monitor single device status or numerous device statuses simultaneously. If you want to view the status of one or more device statuses under the PC window, simply use following steps for operation:

1. Click “Communication” > “Device Batch Monitoring” or click the icon directly.



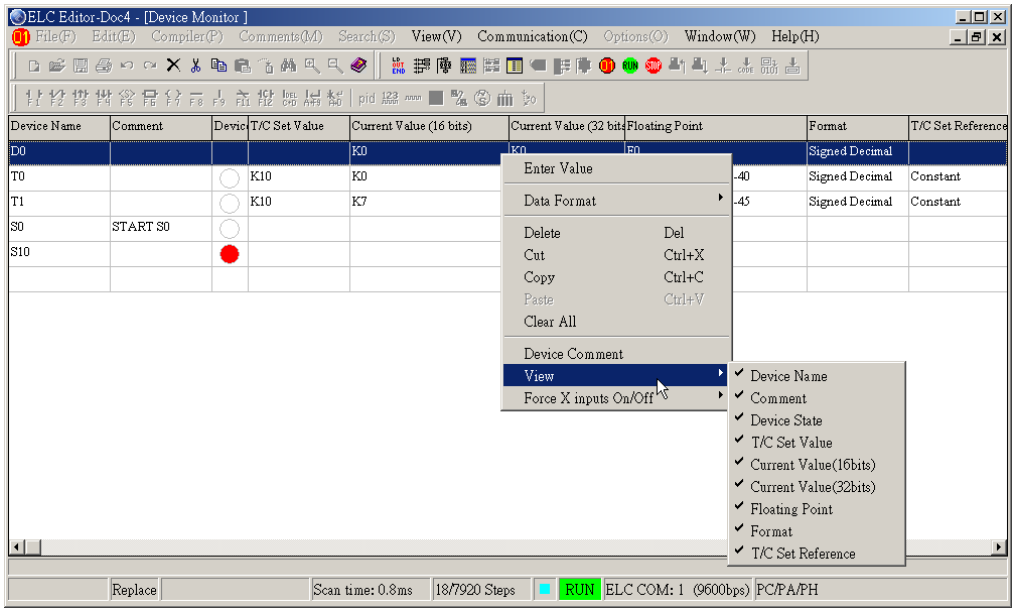
2. Double click on the device name at the following diagram or press [Enter] to get the device monitor input dialog box.



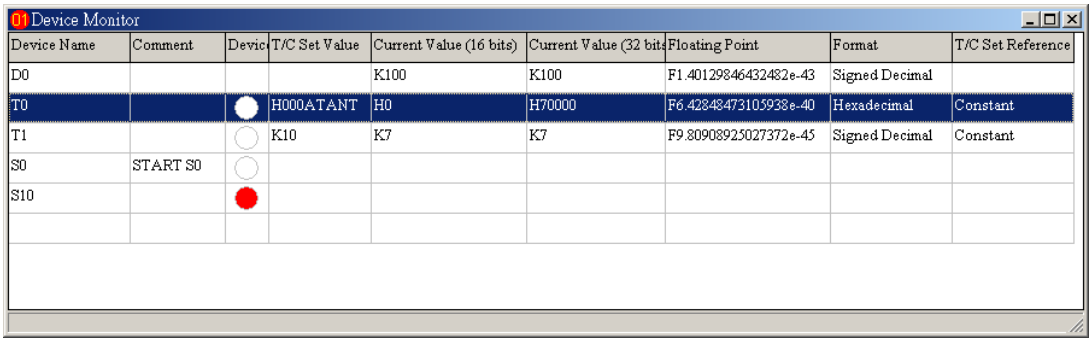
3. Key in the device name and the device number at the “Monitor Device Input” dialog window, then press [OK].

4. If you want to monitor other devices under the same window, simply repeat step 2 and 3. (*Footnote 1)

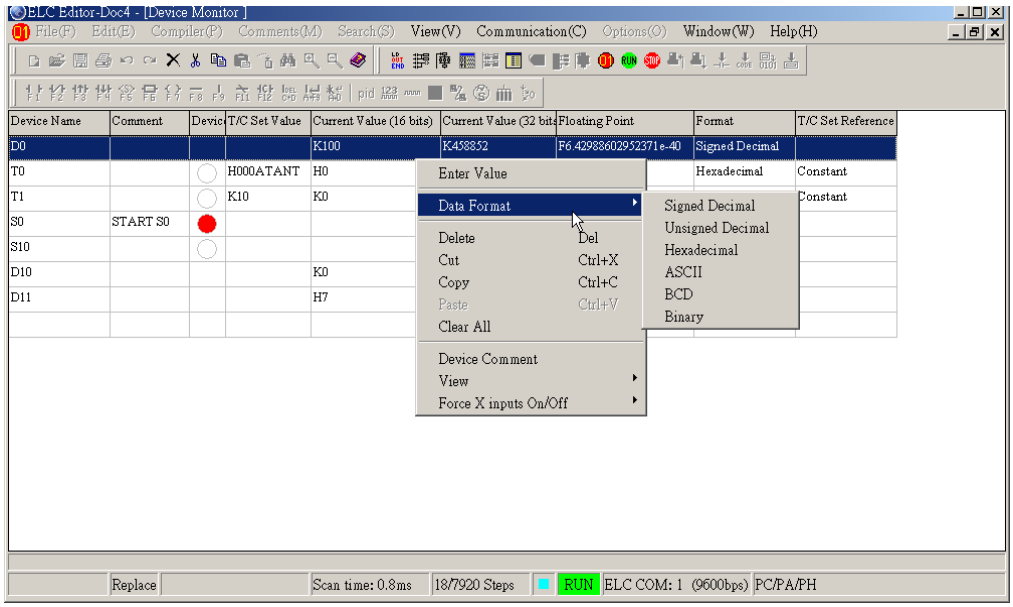
5. You can select “View” from right-click pop-up menu to choose the item you need to monitor.



* Device Name: monitor the device name and number, such as X0, D1000, T2.
* Comments: if there is device comment, you can monitor and edit/update in this window.
* Device state: statuses of the devices (X, Y, M, S, T and C) at monitoring; red block displayed when it’s ON, white circle displayed when it’s OFF.
* T/C Set value: the setup values of devices (T and C) in the program.
* Current value (16Bits): the current value (16Bits) of devices (T, C, D) at monitoring will display its own value (16Bit) only; e.g. the current value (16Bits) of T1 is K7 or H7.
* Current value (32Bits): the current value (32Bits) of devices (T, C, D) at monitoring will display its own value (16Bit) as low word and the next device number (16-bit) as high word; e.g. the current value (32Bits) of T0 displays the 32Bits-value, K458752 or H70000, that means T0 is H0000 and T1 is H0007.
* Floating-point number: ELC uses 32-bit floating-point number that combined by two continuous registers with IEEE754 standard. There will be a character “F” in front of number to represent it, e.g. the number for D0 floating-point number will display F1.40129846432482e-43.



* Format: it provides many number systems, including signed decimal, unsigned decimal, hexadecimal, ASCII, BCD and binary system, for displaying registers T, C and D at monitoring as shown below.



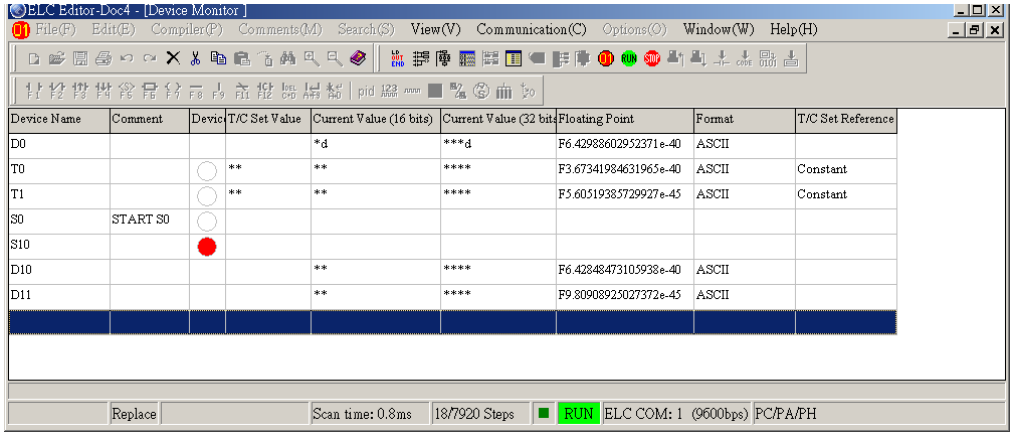
* T, C Set Reference: it displays if device T and C is used in program or not. If it is in use, it will display “constant”, otherwise it will display “none”. If the timer or counter that designated by T or C is a register, it will display the correspondent register.

*Footnote 1:

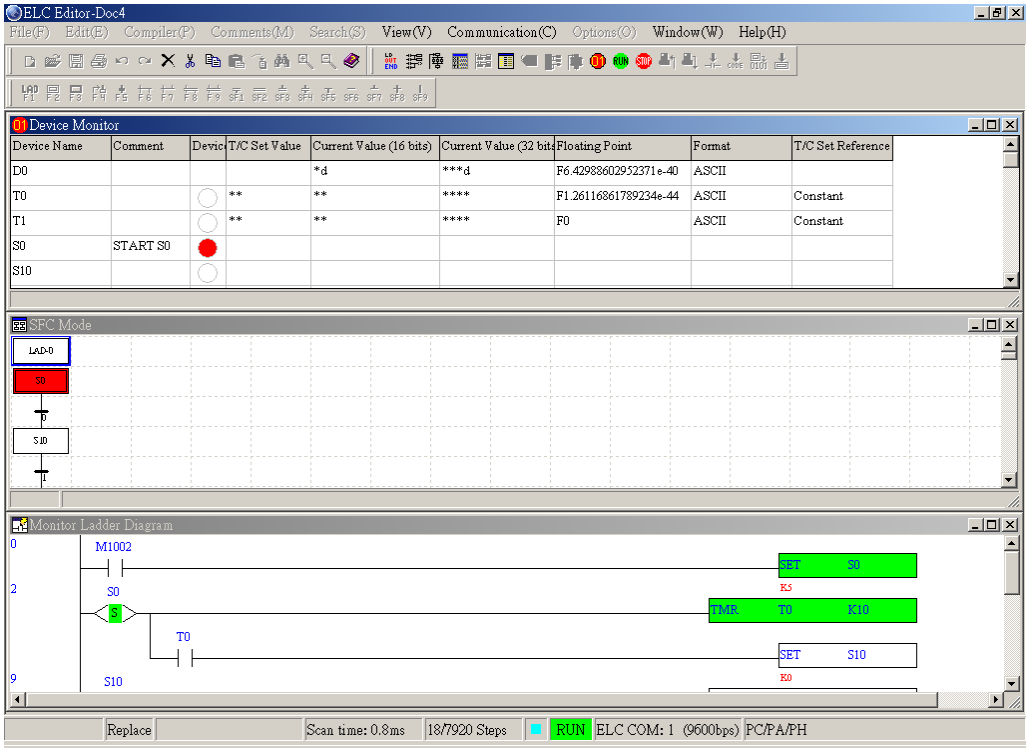
You can unify all display number for monitor by selecting “View” > “Monitoring Data Format” and there are the singed decimal, hexadecimal or ASCII for selection.

In the device monitor mode, the current value (16Bits and 32Bits) format can be set separately. If it is Decimal system, letter K is represented in the front of the number, letter H is represented for the Hexadecimal system, letter F is represented for the floating point, and if it is the ASCII code or BCD code, the figure has to be the code of ASCII or BCD,

otherwise, “*” will be displayed.



Three monitors can be run simultaneously in ELCSoft editor: a. the SFC mode monitor, b. the device monitor, c. the ladder diagram monitor.



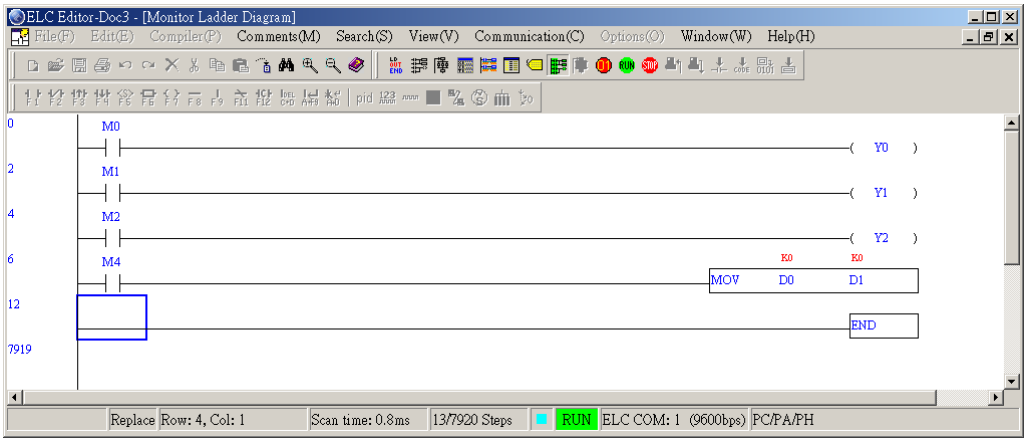
7.8 Device Forced ON/OFF

This instruction could force the status of certain devices to be ON or OFF, before proceeding with the forced ON/OFF operation, make sure that it will not be harmful to the equipment. When the external wirings have all been completed, you could test whether there is error through the forced ON/OFF functions. What follows is the explanation of the operation on the application example:

Application example:

◈ Method 1:

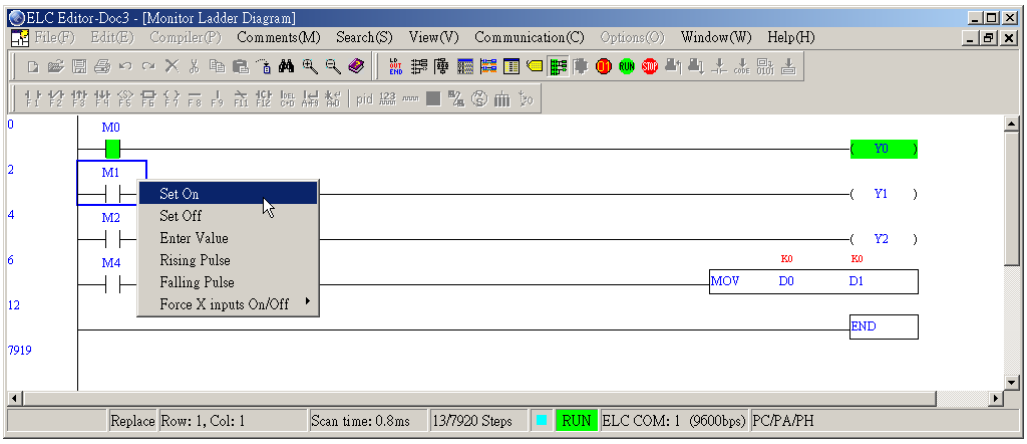
1. After compiling the above ladder diagram program and have it written in to the ELC, click the icon  to enter the ladder start monitoring mode, as shown below.



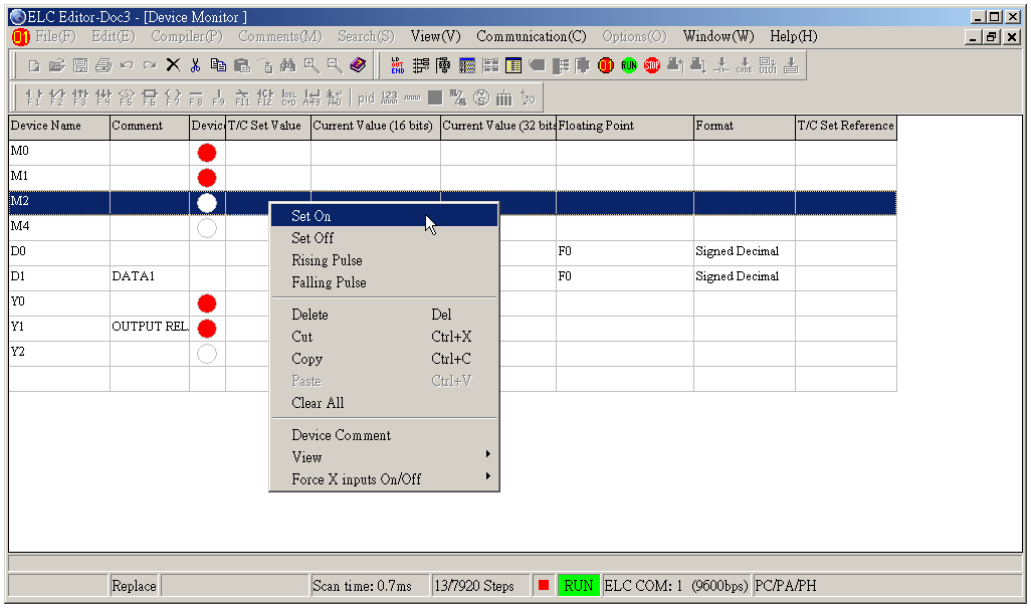
2. In the ladder diagram monitor mode, certain functions listed on the menu bar are not to be used, and ELCSoft will have these not-to-be-used icons displayed in relief.

3. Move the mouse to the forced ON/OFF devices (M1), right-click to get pop-up menu to select the forced ON function. (this function could also be used in the device monitor mode)

Ladder diagram monitor mode:



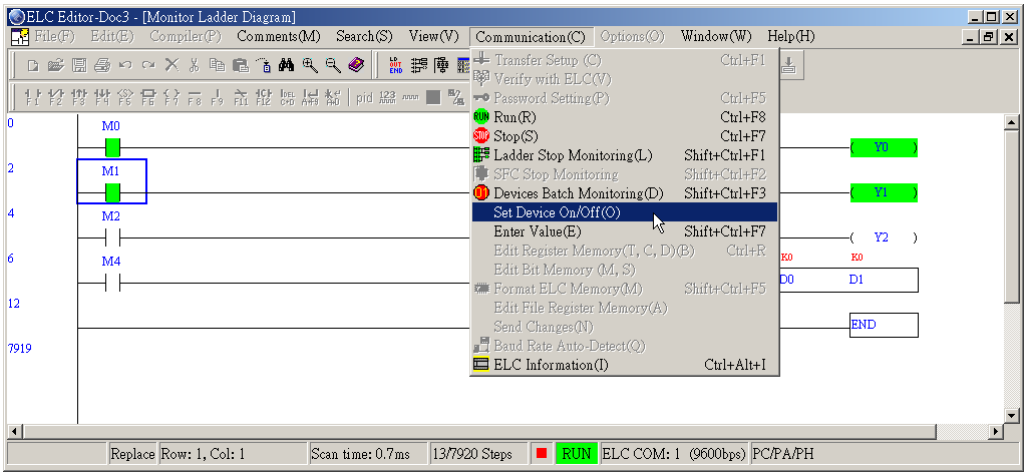
Device monitor mode:



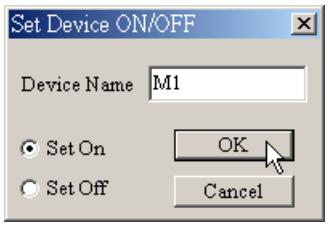
4. If the status of ELC is at the RUN condition, the output coil Y0 will be ON, and if the status is at the STOP condition, only the pre-set device will be in motion (ON/OFF).

◈ Method 2:

1. Click “Communication” > “Set Device On/Off(O)” from the menu bar. (This function could also be used in the device monitor mode)



2. Key in M0 at the device name section in the “Set Device ON/OFF” dialog window, then check the “Forced ON” or “Forced OFF” → press “OK”.



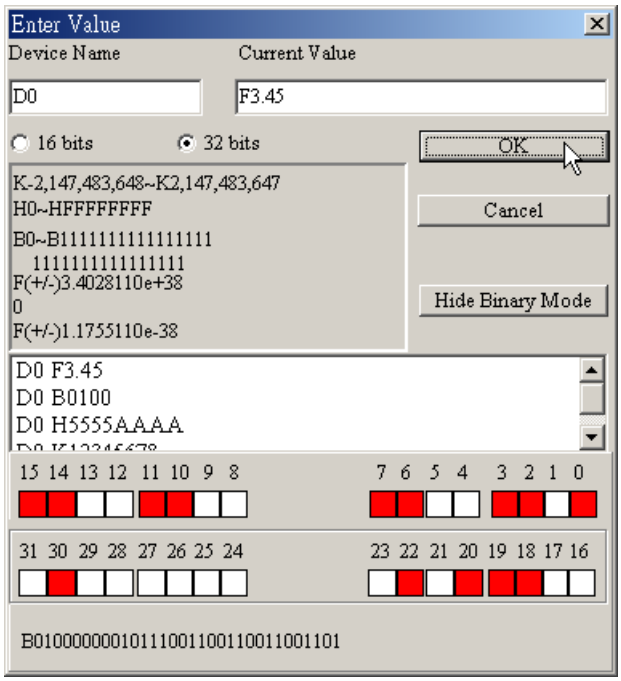
◈ Method 3:

Move cursor to the device you want to force On/Off, then force to be On by pressing “+” and force to be Off by pressing “-“. (this function could be used in the ladder diagram monitor mode and device monitor mode)

7.9 Current Value Setting

This function is only valid in the ladder diagram and the device monitor modes, and use of this instruction could open a window for modifying current values (as shown below); in this window, you could modify the current value (16/32 bit) of devices (D, T, C, E, F).

1. Click “Communication” > “Enter value” to modify current value. (only can be used after monitoring ladder diagram or device)

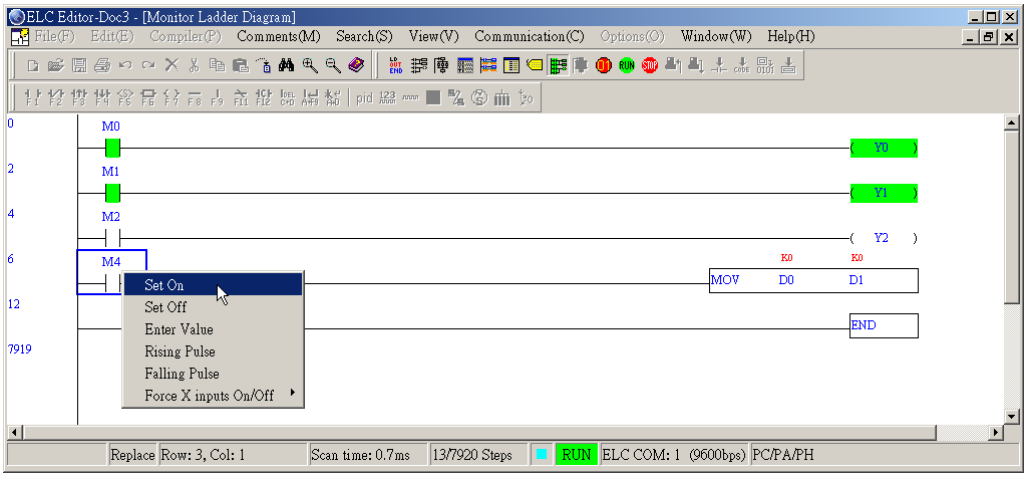


2. You should check suitable format for the device. If device C235 is 32-bit device, you should check 32 bits and if device D0 is 16 bits, you should check 16 bits. If you check 32 bits for D0, that means D1 will be used for representing 32 bits register and D1 is upper 16 bits (high word) and D0 is lower 16 bits (low word).

3. If the current value is the decimal system, the number should be prefixed with a “K” (e.g. K12345678), or if it is the hexadecimal system, the number should be prefixed with an “H” (e.g. H5555AAAA), or if it is the floating point, the number should be prefixed with a “F”(e.g. F3.45), or if it is the binary, the number should be prefixed with a “B”(e.g. B0100).

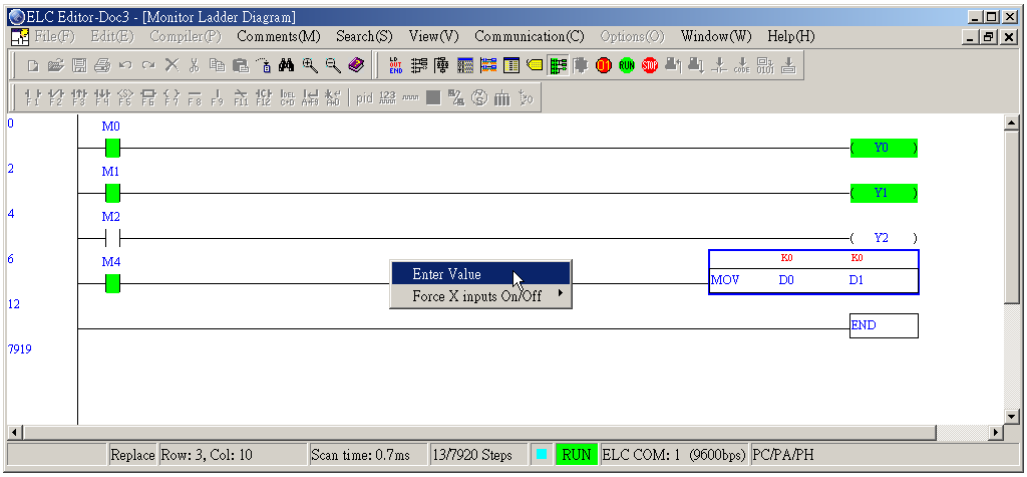
4. In Enter value window, it has a history record for you to enter the repeated instruction by double click the instruction.

■ Application example

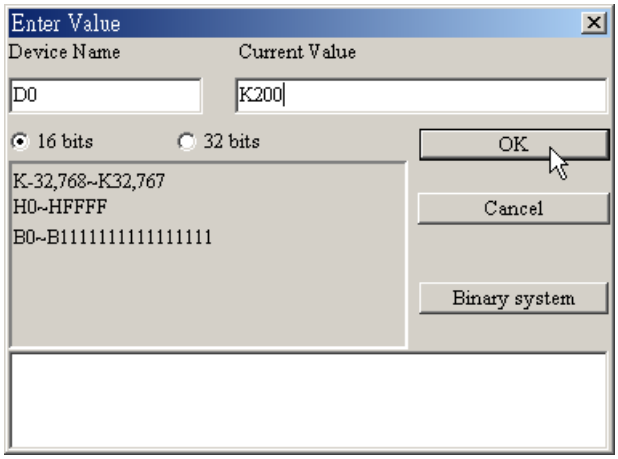


As above figure, in the ladder diagram monitor mode, force the M4 contact to be ON first, and since the current value of D0 is K0, we are to change the value to be K200.

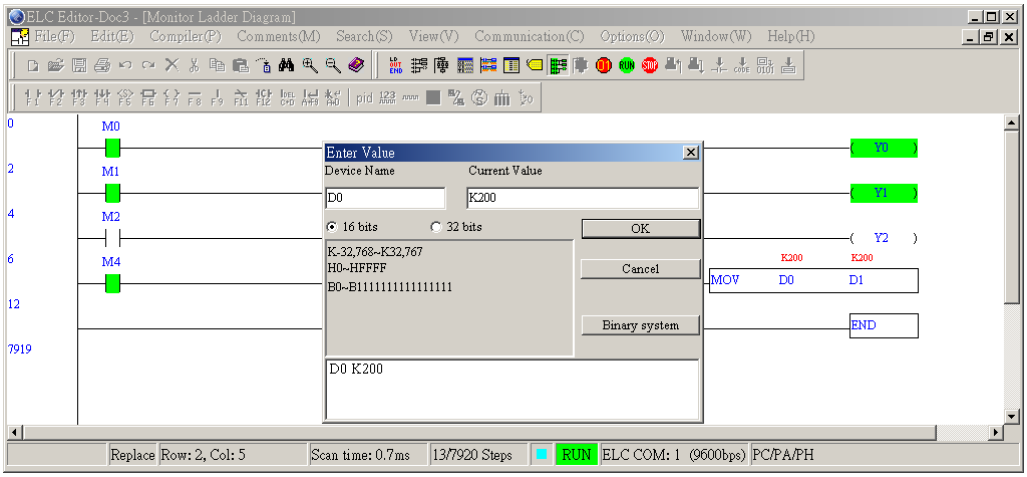
1. Click “Communication” > “Enter value” from the menu bar to change current value.



2. After following dialog box appears, key in the device name D0 and the current value K200, then press “OK”.

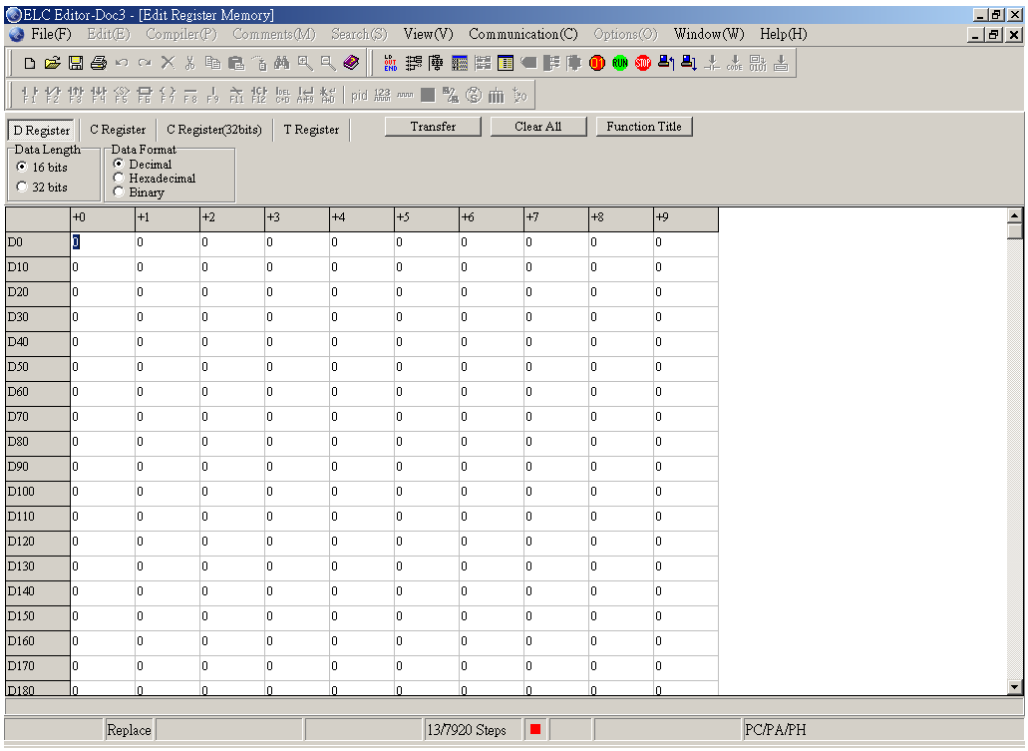


■ The current value of the D0 register will be changed to K200.



7.10 Edit Register Memory(T, C, D)

ELCSoft provides register (T, C, D) edition functions, including edit, read communication, write, save/open file and print. (As shown below)

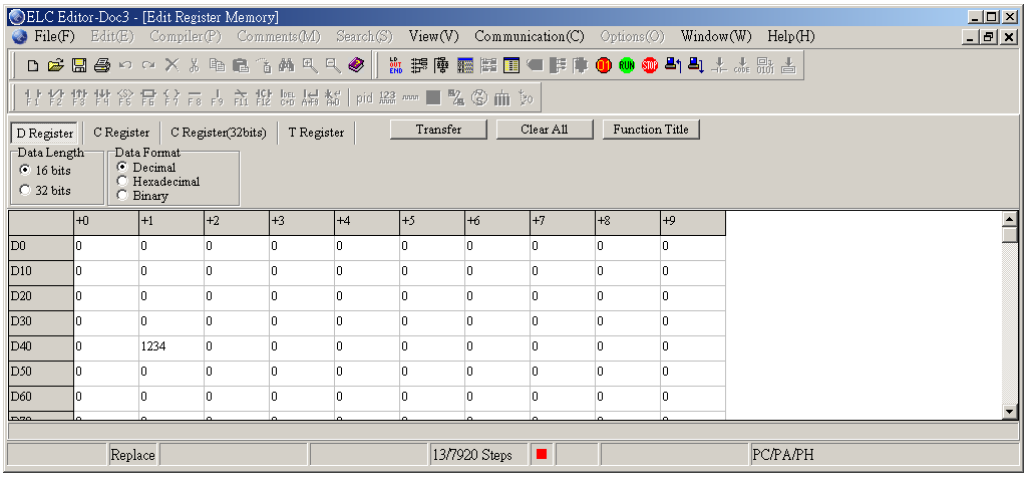


	+0	+1	+2	+3	+4	+5	+6	+7	+8	+9
D0	0	0	0	0	0	0	0	0	0	0
D10	0	0	0	0	0	0	0	0	0	0
D20	0	0	0	0	0	0	0	0	0	0
D30	0	0	0	0	0	0	0	0	0	0
D40	0	0	0	0	0	0	0	0	0	0
D50	0	0	0	0	0	0	0	0	0	0
D60	0	0	0	0	0	0	0	0	0	0
D70	0	0	0	0	0	0	0	0	0	0
D80	0	0	0	0	0	0	0	0	0	0
D90	0	0	0	0	0	0	0	0	0	0
D100	0	0	0	0	0	0	0	0	0	0
D110	0	0	0	0	0	0	0	0	0	0
D120	0	0	0	0	0	0	0	0	0	0
D130	0	0	0	0	0	0	0	0	0	0
D140	0	0	0	0	0	0	0	0	0	0
D150	0	0	0	0	0	0	0	0	0	0
D160	0	0	0	0	0	0	0	0	0	0
D170	0	0	0	0	0	0	0	0	0	0
D180	0	0	0	0	0	0	0	0	0	0

You could designate the D register(except special D), the C register(high-speed counter is included), the T register, among all types of registers, to have the current value of each register undergone communication read/write, data save and data retrieve (*Footnote 1). The digital display and input method can be selected from “data format”.

1. Click “Communication” > “Edit Register Memory(T, C, D)” from the menu bar or use keyboard shortcuts by pressing key (Ctrl)+ (R).

2. After opening view window, double click to input the designated register value (e.g. D41) → then key in the value “1234” → press “Enter”; there are the decimal, the hexadecimal, and the binary systems for the value input. (As shown below)

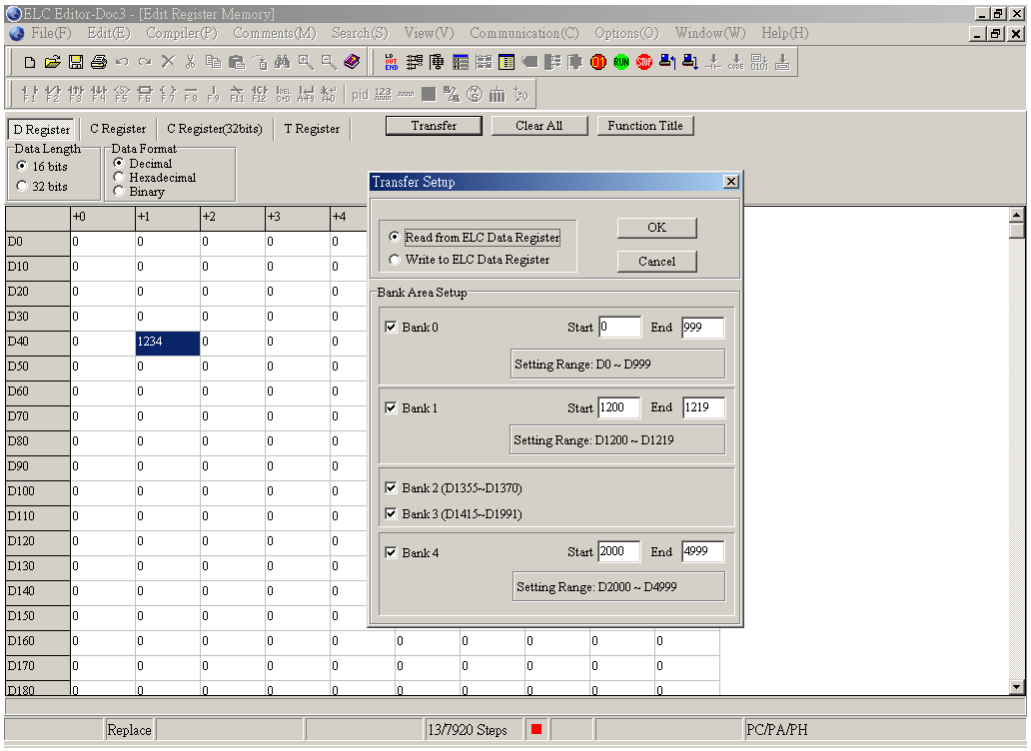


	+0	+1	+2	+3	+4	+5	+6	+7	+8	+9
D0	0	0	0	0	0	0	0	0	0	0
D10	0	0	0	0	0	0	0	0	0	0
D20	0	0	0	0	0	0	0	0	0	0
D30	0	0	0	0	0	0	0	0	0	0
D40	0	1234	0	0	0	0	0	0	0	0
D50	0	0	0	0	0	0	0	0	0	0
D60	0	0	0	0	0	0	0	0	0	0

3. After completing all the register values input, press “transfer” to write values into designated ELC.

4. You can read or write ELC register and set read/write area.

5. Before writing, make sure that no bad effects will be incurred to the ELC that are in operation.



■ There are numerous functions to edit the register:

1. Read From ELC data register: read the register value from the ELC that is communicated currently.

2. Write to ELC data register: write the value into the ELC that is communicated currently.

3. Print: When the registers editing windows is activate, click the icon  on toolbar or choose “Print” command from the “File” menu. The printing dialog box will pop up and then users can select printing options to print the editing registers.

4. Save file into disk: Click “File” > “Save(S)” to save the edited data register into the disk with the * .DVL file format. (*footnote 1)

5. Read file from disk: Click “File” > “Open(O)” to read * .DVL file.

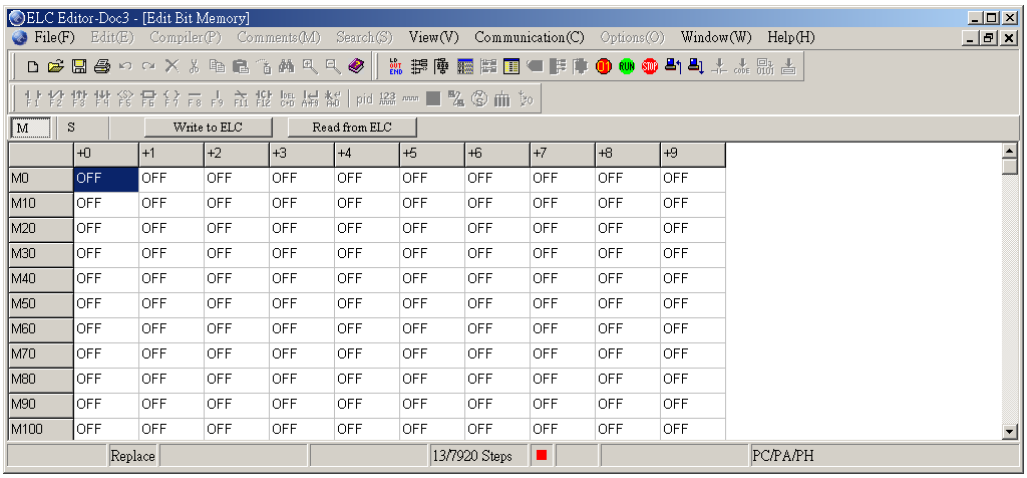
6. Clear All: clear the data from the currently edited data register (D, C, the high-speed counter and T).

7. Function Title: editing Function Title.

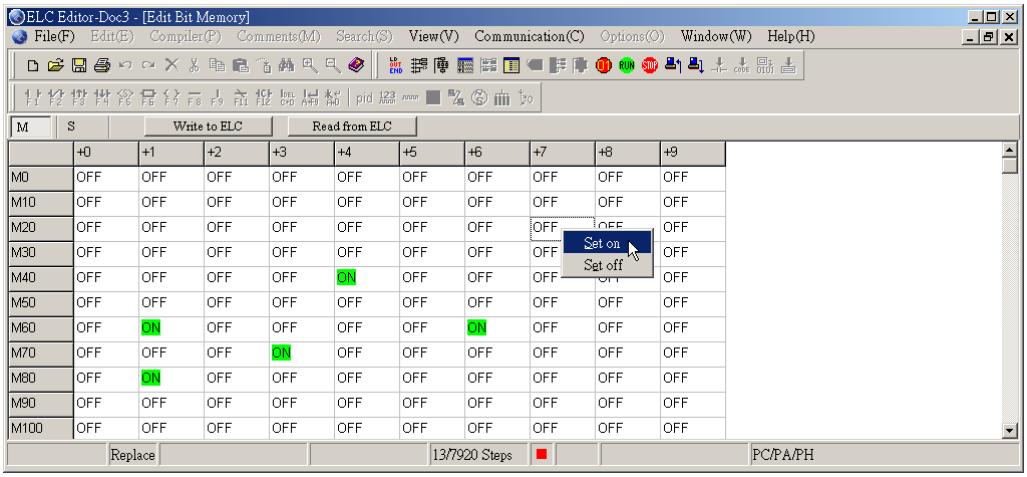
* Footnote 1: The file format of the edited register for retrieve is the *.DVL.

7.11 Edit Bit Memory(M, S)

ELCSoft provides register (M, S) edition functions, including edit, read communication, write, retrieve file (Footnote 1) and print. (As shown below)



1. Click “Communication” > “Edit Bit Memory(M, S)” from the menu bar.
2. You can double click to set ON/OFF in the edition window.



3. After completing edition, select “write to ELC” or “read from ELC” to transmission. Please make sure that no bad effects will be incurred to the ELC that are in operation.

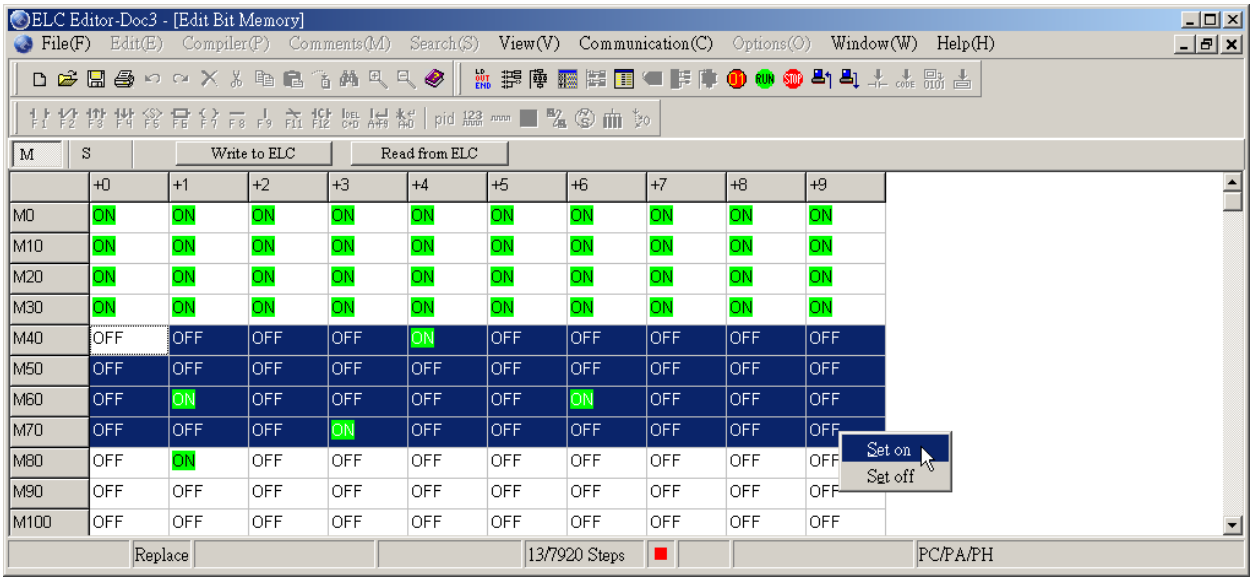
Write to ELC

Read from ELC

■ There are numerous functions to edit the register:

1. Read from ELC: read the state from ELC internal device (M, S).
2. Write to ELC: write the state into ELC internal device (M, S).
3. Print: When Bit Memory(M, S) windows is activate, click the icon  on toolbar or choose “Print” command from the “File” menu. The printing dialog box will pop up and then users can select printing options to print the Bit Memory(M, S).
4. Save file into disk: Click “File” > “Save(S)” to save the edited data register into the disk with the * .DVB file format.
5. Read file (Disk): Click “File” > “Open(O)” to read * .DVB file.

6. Block setting: you can select many states once and right-click to get pop-up menu to set the states to be ON or OFF.

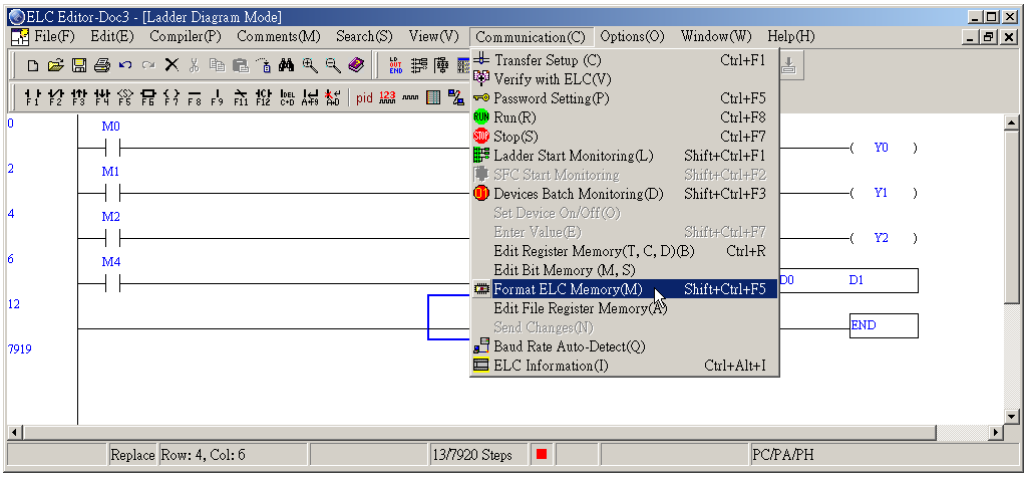


* Footnote 1: The file format of the edited register for retrieve is the *.DVB.

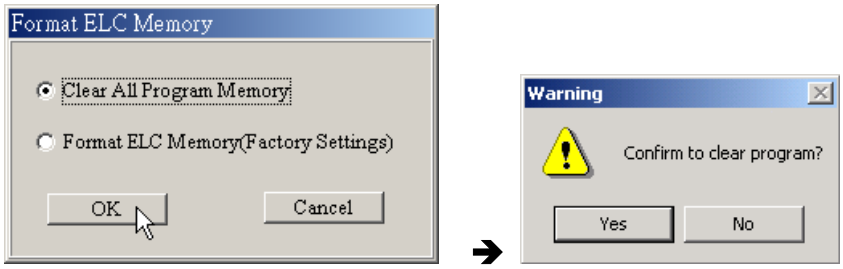
7.12 Format ELC Memory

ELCSoft provides clear ELC memory function and is only valid when PCL is ON (as shown below)

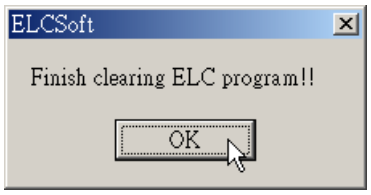
1. Click “Communication” > “Format ELC Memory” from menu bar.



2. Press Yes(Y) to confirm to clear ELC program in the confirmation dialog box.



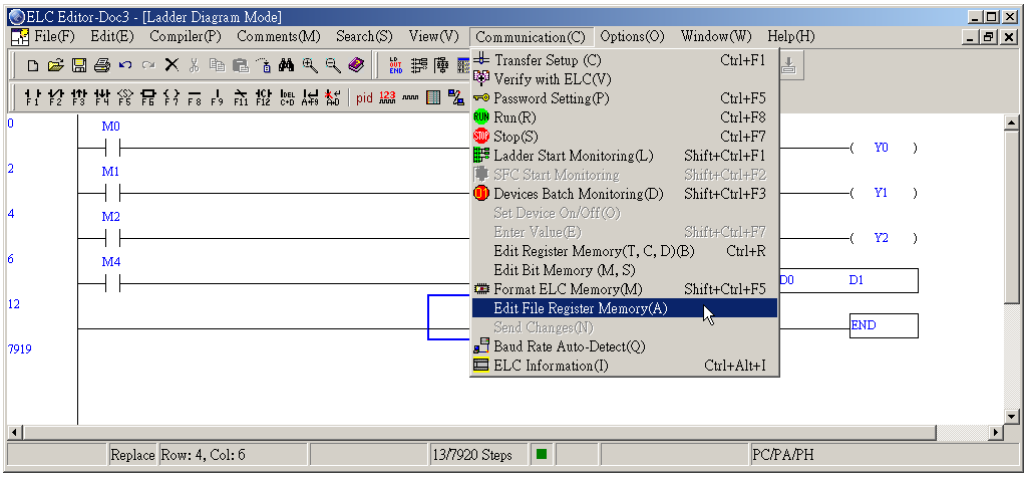
3. Finish clearing.



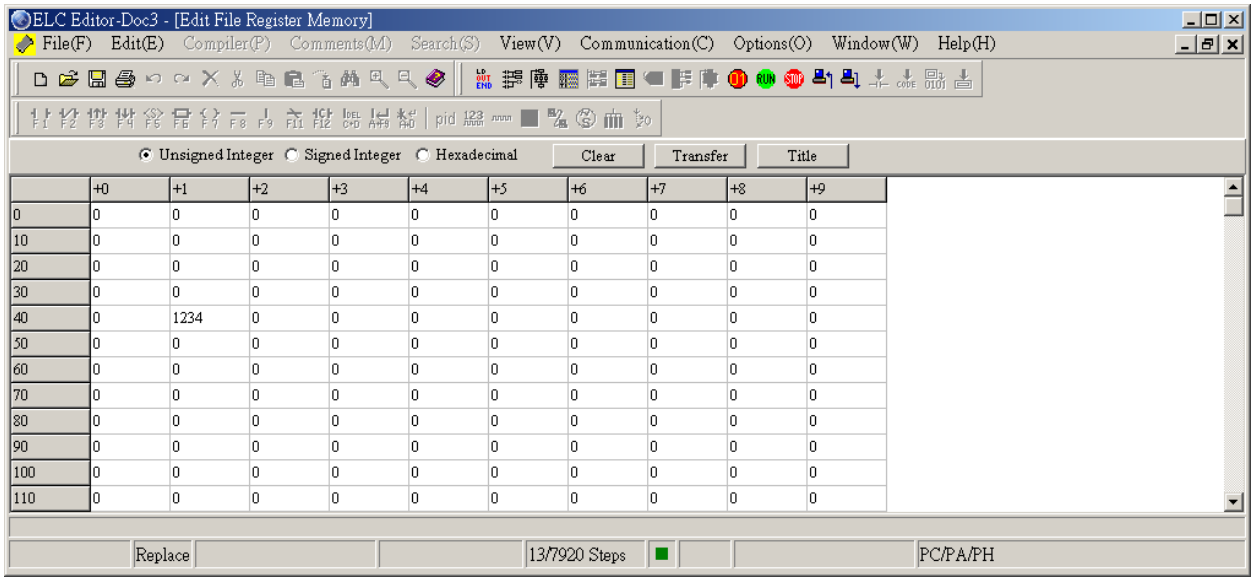
7.13 File Register

ELC-PC/PA/PH models provide file register function to read/write via ELCSoft edit.

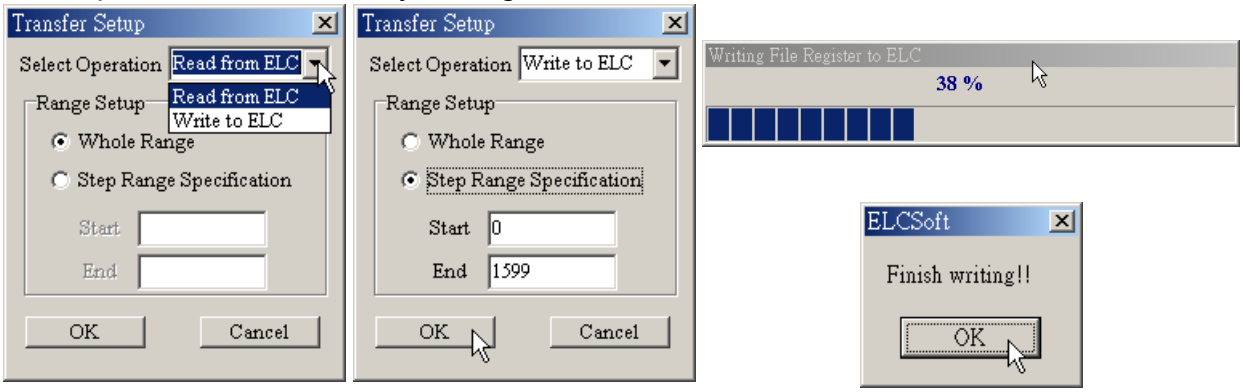
1. Click “Communication” > “Edit File Register Memory(A)” from menu bar.



2. After opening file register window, double click to input the designated register value (e.g. 41) → then key in the value “1234” → press “Enter”; there are the unsigned decimal, the signed decimal, and the hexadecimal systems for the value input. (As shown below)



3. After completing each file register settings, click “transfer” to read/write ELC. You can select partial transmission by setting start and the end address to read/write ELC.



4. Before writing, make sure that no bad effects will be incurred to the ELC that is in operation.

■ There are numerous functions to edit the file register memory:

1. Read from ELC: read data from ELC file register.

2. Write to ELC: write the edited data into ELC.

3. Print: When file register memory windows is activate, click the icon  on toolbar or choose “Print” command from the “File” menu. The printing dialog box will pop up and then users can select printing options to print the file register memory.

4. Save file to disk: Click “File” > “Save(S)” to save file register memory data with extension file WFT into disk.

5. Read file to disk: Click “File” > “Open(O)” to read * .WFT file.

6. Clear: clear all file register content.

7. Title: editing Title.

* Footnote 1: The file format of the edited register for retrieve is the *.WFT.

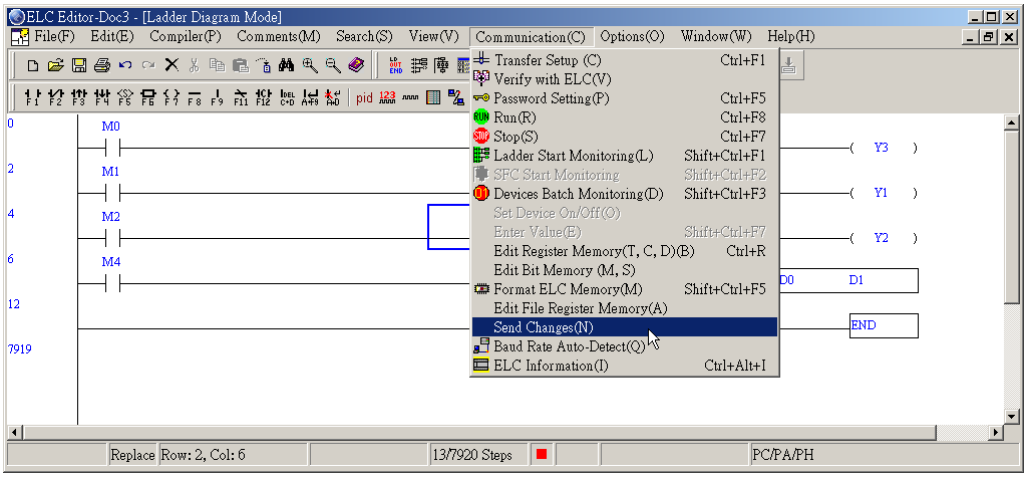
7.14 Send Changes

ELC-PC/PA/PH models allow modifying partial program or device when it is at RUN time and the limit for modification range is less than 15 STEPS. It is only for ladder diagram mode. Please make sure that no unexpected danger will occur before operation.
After modifying program and generating new program code through compiler, you can select “Communication” > “Send Changes” from menu bar for update.

- The steps for “send changes” :

1. ELCSoft is reading or writing a ELC program into ELC and ELC is at RUN time.

2. For ELCSoft program modification, it is 15 STEPS maximum. You can update program immediately by selecting “Communication” > “Send Changes”.

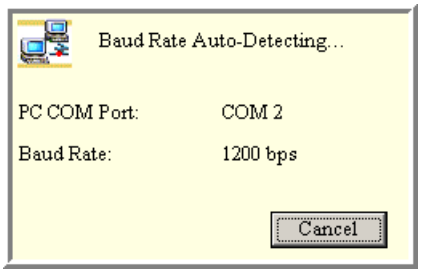


3. Please press “Yes(Y)” to update program in the confirmation dialog box.

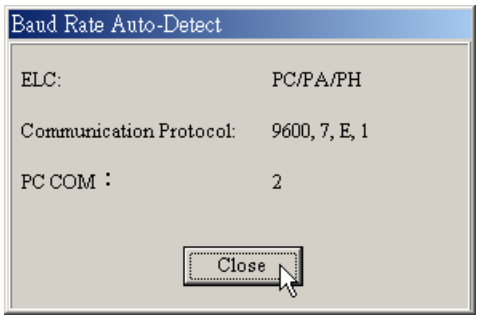
7.15 Baud Rate Auto-Detect

ELCSoft editor can auto-detect the ELC communication speed.

It is detecting (you can break the communication by pressing “Cancel”)



Succeed to detect (display detection information)

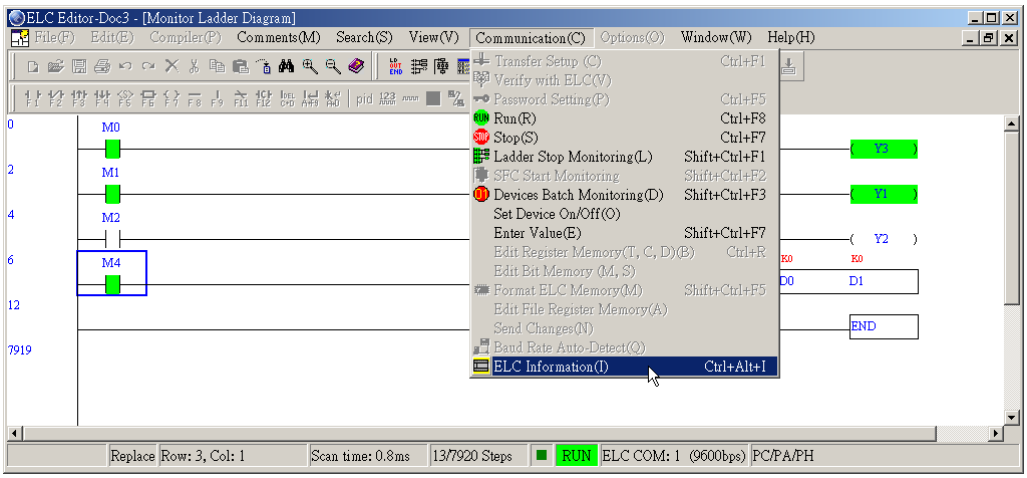


Fail to detect (Please check communication setting)

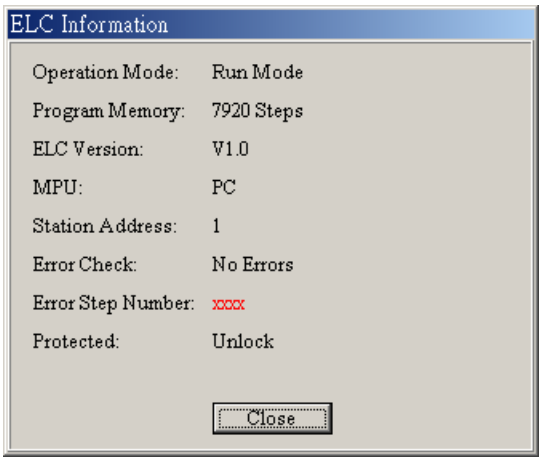
7.16 ELC Information

ELCSoft provides ELC with the detection function on the ELC status information (as shown below).

1. Click “Communication” > “ELC Information” from the menu bar.

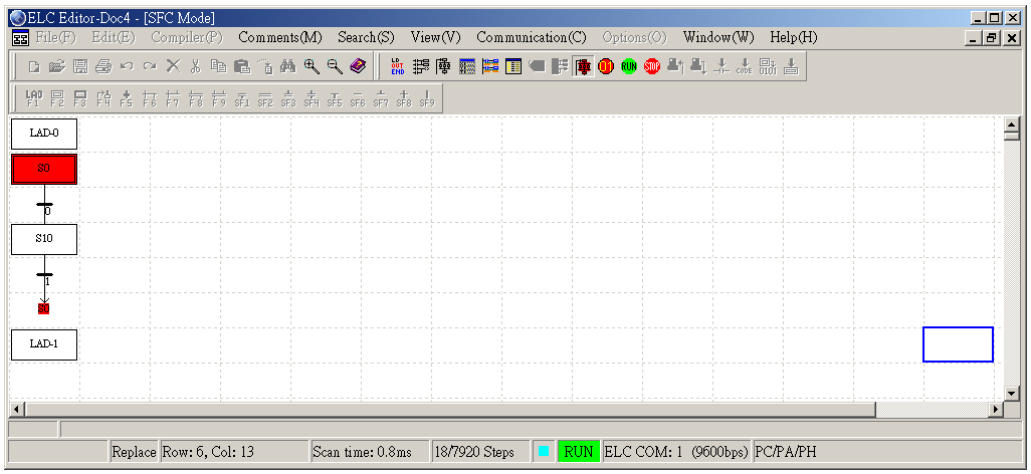


2. Provide the following ELC information, e.g. the ELC Operation Mode, the Program Memory, the ELC version, ELC model name(MPU), the ELC Station Address, Error check, Error Step Number, Protected, etc.



8.1 SFC Editing Environment

Start up ELCSoft, and click “New” to create a new screen or click “Open” to open an old file. Then, users can enter into the editing environment of SFC (Sequence Function Chart) diagram mode and use SFC diagrams to create ELC programs as the figure shown below.



To edit the SFC diagrams, users can use SFC toolbox shown on the upper side of the SFC mode page or function keys (F1~F9, (Shift) + (F1~F9)) on the keyboard. In the following sections, we will introduce you the methods and steps for creating and editing SFC diagrams.

8.2 Basic Operation

■ SFC Editing Principle:

SFC (Sequence Function Chart) is one of the programming languages defined in the IEC1131-3 Standard and it is also one kind of the diagram editing mode. However, the whole structure of SFC diagram looks like a flow chart. In fact, it is to utilize the Step Relay S within the ELC. The number of every Step Relay S is to serve as a step point, which is equivalent to each procedure of the flow chart. After current procedures are completed, move on to the next procedure (which is the next step point S) requested according to the preset terms, in this case, users can simply follow the procedure repeatedly to obtain the best results that users need.

■ SFC Toolbar and Icons Explanation:

Icons shown on	Description of Icons	Explanation: (Click the icon or press the function keys (F1 ~F9))

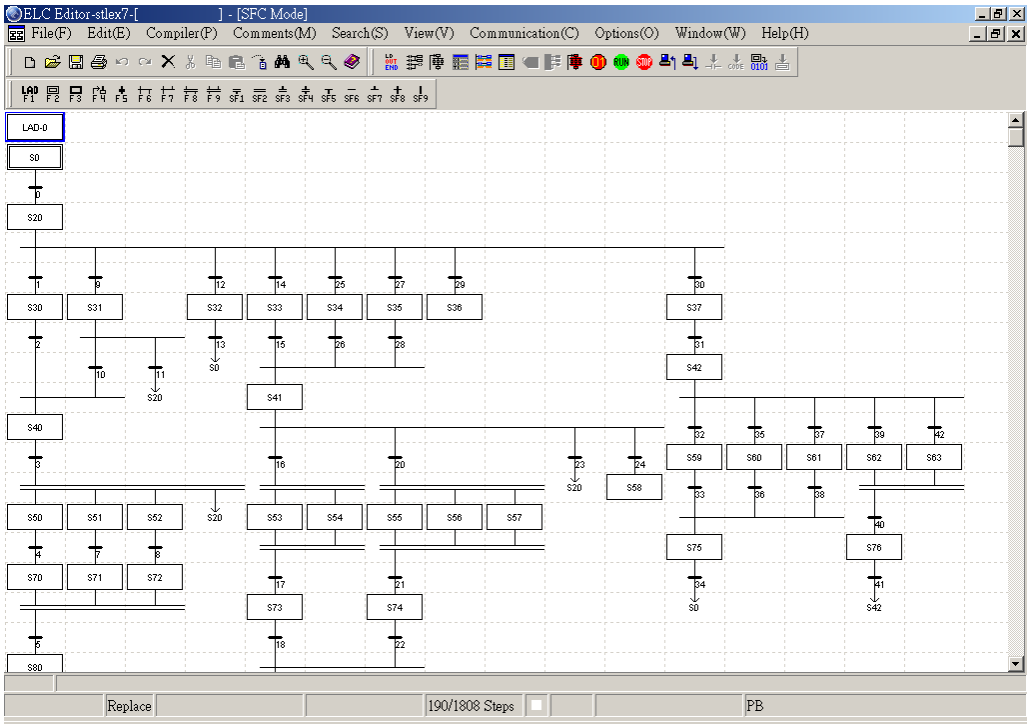
SFC toolbar		
	Common ladder	Ladder diagram mode: indicates the inner editing program is the common ladder diagram (inner ladder diagram), not the step ladder program.
	Initial diagram of SFC	Diagram for the initial step point: This double-framed diagram is used for SFC initial step point. The available devices are S0~S9.
	Common SFC	Diagram for the common step point: The available devices are S10~S1023. (For ELC-PB series models, the available devices are S10~S127)
	Jump diagram	Jump diagram for the step point: It is used to move from one step point to another that is not right next to it (step point jump up and down to the point that is not sequenced in order in the same procedure, return back to the initial step point, and jump between different program processes).
	Condition diagram	Transition condition diagram for step point: It is the transition condition of step point that used to move between each step point.
	Divergence of condition diagram	Alternative divergence of condition diagram: It is alternative divergence that used for a step point to move to different corresponding step point by different transition condition (If the divergence is consisted of more than two points, users can press function keys (Shift) + (F1~F9) to add more points for the divergence).
	Convergence of condition diagram	Alternative convergence of condition diagram: It is alternative convergence that used for two step points or more to move to the same step point according to transition condition (If the convergence is consisted of more than two points, users can press function keys (Shift) + (F1~F9) to add more points for the convergence).
	Divergence diagram	Simultaneous divergence diagram: It is simultaneous divergence that used for a step point move to two step points or more by the same transition condition (If the divergence is consisted of more than two points, users can press function keys (Shift) + (F1~F9) to add more points for the divergence).
	Convergence diagram	Simultaneous convergence diagram: It is simultaneous convergence that used for two step points or more to

		move to the same step point with the same transition condition when the condition is established at the same time (If the convergence is consisted of more than two points, users can press function keys (Shift) + (F1~F9) to add more points for the convergence).

Icons shown on SFC toolbar	Description of Icons	Explanation: (Click the icon or press the function keys (Shift) + (F1 ~F9))
	Auxiliary line	Auxiliary line for simultaneous divergence diagram
		Auxiliary line for simultaneous connection diagram
		Auxiliary line for simultaneous convergence diagram
		Auxiliary line for simultaneous connection diagram
		Auxiliary line for alternative divergence diagram
		Auxiliary line for alternative connection diagram
		Auxiliary line for alternative convergence diagram
		Auxiliary line for alternative connection diagram
		Auxiliary line for vertical-line connection diagram

■ SFC Editing Environment:

In SFC mode, up to 16 columns (horizontal direction) can be used for programming, whereas there is no limit of the rows (vertical direction). Every dotted cell stands for one SFC symbol, and therefore, a maximum of 16 columns could be displayed on the screen in the horizontal direction at the same time.



■ SFC Editing Methods:

Method 1: Establish the whole structure of SFC diagram first and then edit the inner ladder diagram of each SFC symbol.

Step 1: After entering SFC mode, the SFC toolbar will appear on the upper side of the SFC mode page. Normally, the first one is ladder diagram mode (press the function key [F1], or click the icon  on SFC toolbar) as the next one is the initial diagram of SFC, which available device is from S0 to S9. A regular ELC program will not enter the structure of SFC in the beginning, and therefore, the inner program of the first LAD-0 diagram is usually the pre-program and used to enter the structure of SFC.

Step 2: Mapping out the initial diagram of SFC (press the function key [F2], or click the icon  on SFC toolbar) and select one initial step point (S0 ~S9), i.e. the first step point that enter into the structure of SFC (This initial step point can be specified to S0~S9 only, if users use other step points with different numbers as the initial step points, an error message will be displayed in the last compiling process of the program. If in the ladder diagram mode and instruction mode, and the initial step points are not one of S0~S9, the SFC diagram cannot be converted correctly in the last compiling process of the program).

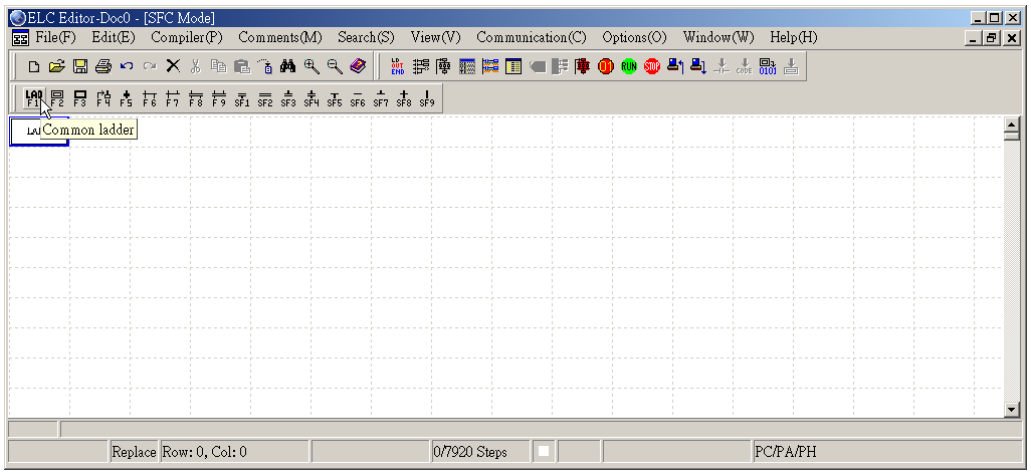
Step 3: The transition condition diagram is essential between different step point diagrams (press the function key [F5], or click the icon  on SFC toolbar). Thus, each step point can link and move to other step points by the transition condition when the program is running. The inner ladder diagram of the step point is the program so far that can be executed to reach the position of this step point, and the inner ladder diagram of the transition condition diagram is the transition conditions among different step points. (If the step point in the inner ladder diagram is not the same as the step point for transition in SFC diagram, only the step point in SFC diagram is recognized after the program is compiled thoroughly).

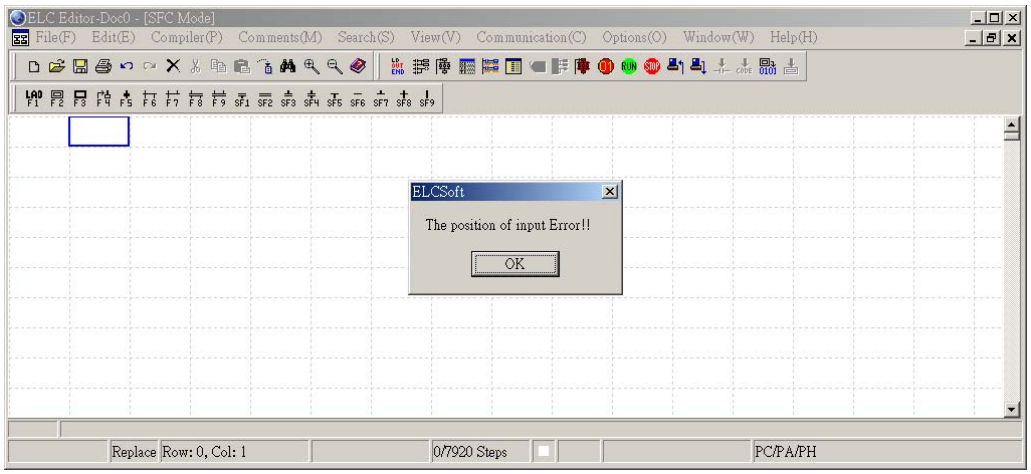
Step 4: When editing SFC diagram, use the far left cell as the criterion, and then edit SFC diagram in order from top to bottom and from left to right. Before editing the inner program within each step point (if there is no program within the step point), users can enter the inner ladder diagram mode and edit the inner program (Right click your mouse and choose the “Inner Ladder Mode” from the pop-up menu).

Step 5: When edit the SFC diagram, the downward step point that is sequenced in order could be connected by using common SFC diagram (press the function key [F3] or click the icon  on SFC toolbar). However, if step point jump up and down to the point that is not sequenced in order, or return back to the initial step point or jump between different program processes, use the Jump Diagram (press the function key [F4], or click the icon  on SFC toolbar). The device number of every common step point diagram and initial step point diagram could only show up for one time when editing the SFC diagram.

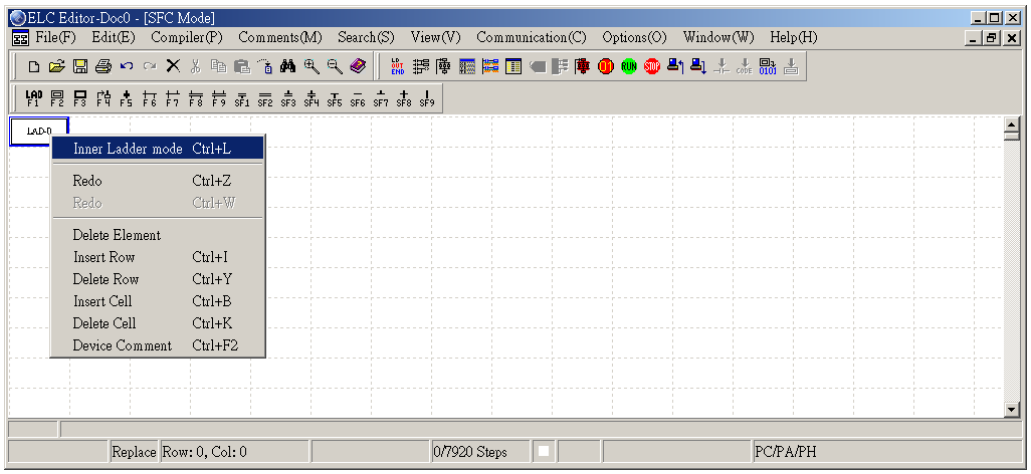
Method 2: Edit each SFC symbol and its internal ladder diagram simultaneously and then complete the whole structure of SFC diagram.

Step 1: When start editing, select the ladder diagram mode first as the pre-program to enter the SFC structure, and press the function key [F1], or click the icon  on SFC toolbar. Place the editing block in the position of the far left column. As for the LAD-□ shown in the SFC editing window, the number of □ will increase progressively and automatically according to the times that the icon  is clicked. If the position of the editing block is incorrect, an error message dialog box will appear to warn you that the input position is incorrect.





Step 2: After the ladder diagram LAD-0 is set, start to edit the inner ladder diagram of LAD-0. First, move the editing block to the ladder diagram LAD-0, and then right click your mouse. Then, choose the “Inner Ladder Mode” from the pop-up menu.

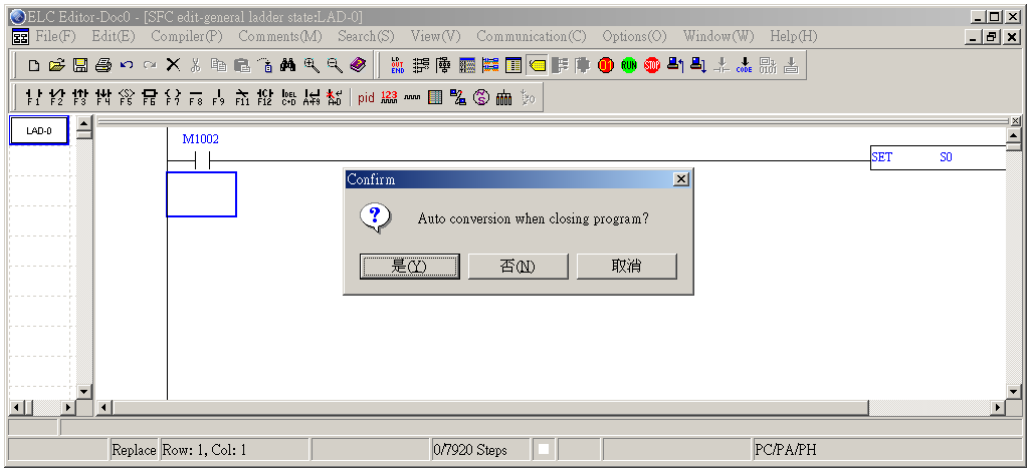


Step 3: After clicking the “Inner Ladder Mode” from the pop-up menu, the window for editing the internal ladder diagram will show on the right side of the original SFC mode window. Then, users can enter the following instructions in accordance with the editing methods of the ladder diagrams:

LD M1002

SET S0

Editing in Internal Ladder Mode:

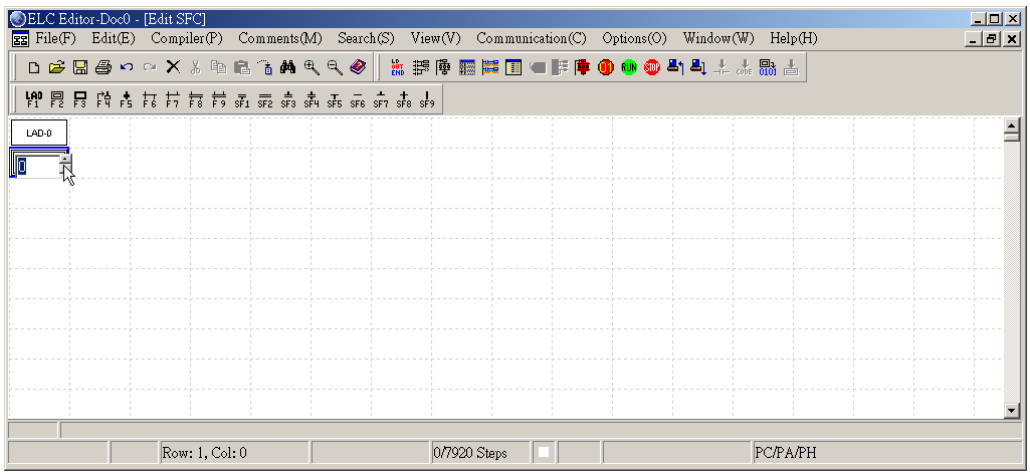


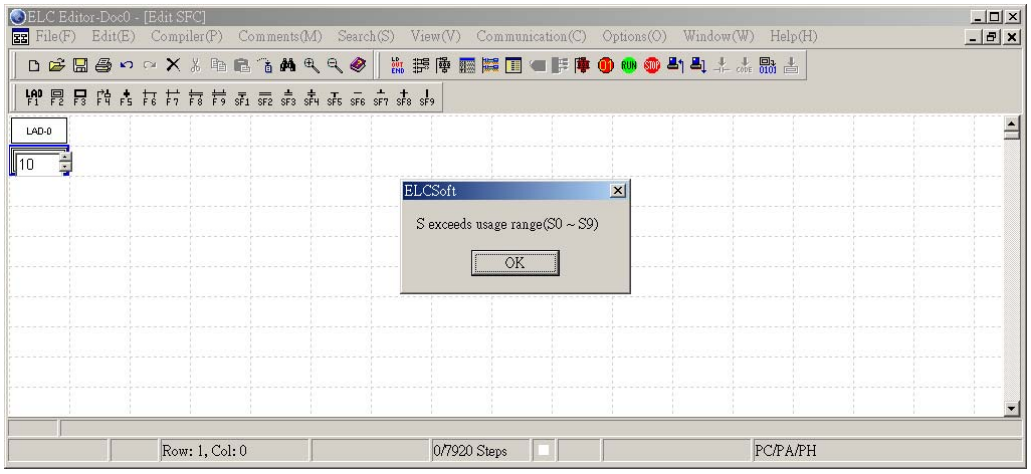
Step 4: After the editing is completed, close the internal ladder diagram mode, and the program that was just edited will be saved in the ladder diagram LAD-0. At this time, if you double click the mouse to activate the “Inner Ladder Mode”, then you can see the previous edited inner ladder diagram or inner instruction already existed in the ladder diagram LAD-0.

Step 5: When you want to modify the inner ladder diagram of the diagram LAD-0, move the editing block to where the diagram LAD-0 is, and right click you mouse to choose the “Inner Ladder Mode” from the pop-up menu (Refer to Step 2 and Step 3).

Step 6: Next, plan to edit the initial step point diagram. Move the editing block to the next row and press the function key [F2], or click  on SFC toolbar. At the same time, the SFC editing window will request you to input the number of the step point. Since this is the initial step point, the available devices are S0~S9 (choose the desired device by click on the “Up” and “Down” key right of the cell or simply type the device you want). If the number you choose is not within the range of 0~9, the “S exceeds usage range (S0~S9)” warning message will pop up. Besides, when entering the device number, it does not matter if device name “S” does not input since it will be added automatically in SFC mode. After the numbering is completed, press Enter key on the keyboard, or left click your mouse twice, or simply move the editing block away.

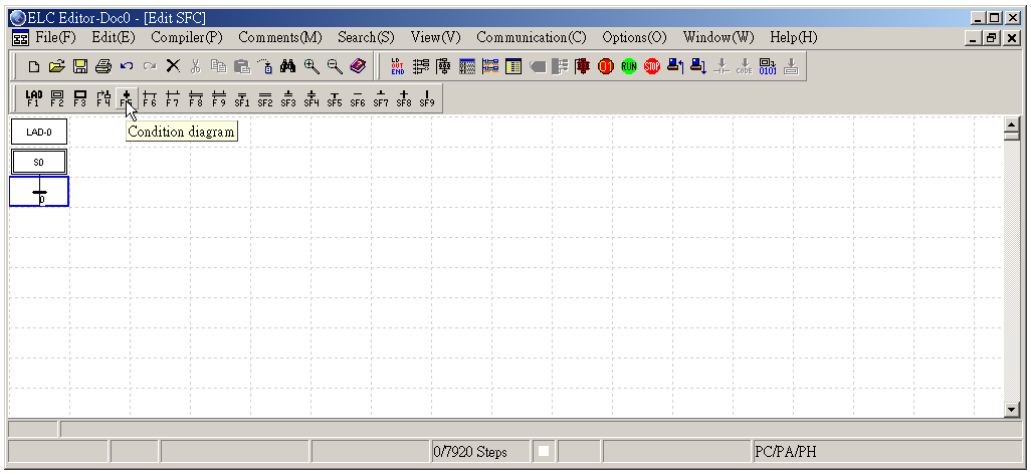
No transition condition diagram for step point is needed between the ladder diagram mode and the initial step point diagram





Step 6: So now you can edit the internal program of the initial step point diagram S0. Move the editing block to where the initial step point diagram located, and right click your mouse to choose the “Inner Ladder Mode” from the pop-up menu (Refer to Step 2 and Step 3).

Step 7: The transition condition diagram is essential between different step point diagrams (press the function key [F5], or click the icon  on SFC toolbar). The editing method of the inner program of the transition condition diagram is the same as Step 2 and Step3, which could write in the transfer conditions. Every added condition diagram has its own number. The rule for numbering the condition diagram of the structure of SFC diagram is that numbering from top to bottom and from left to right in order.

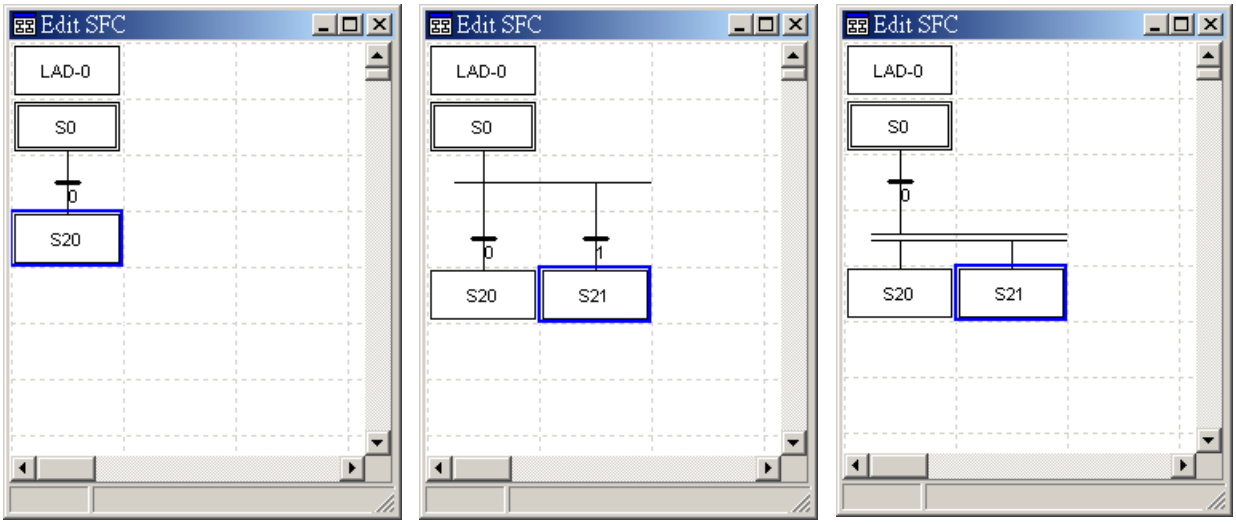


Step 8: Design the common step points for connection. If there is no divergence, then the downward step point that is sequenced in order could be connected by using common SFC diagram (press the function key [F3], or click the icon  on SFC toolbar). If there is divergence, use the alternative divergence of condition diagram (press the function key [F6], or click the icon  on SFC toolbar) for alternative connection and use the simultaneous divergence diagram (press the function key [F8], or click the icon  on SFC toolbar) for simultaneous connection. After that, users can then edit the internal program of every step point diagram. Move the editing block to where the initial step point diagram located, and right click your mouse to select the “Inner Ladder Mode” from the pop-up menu (Refer to Step 2 and Step 3).

1. No divergence:
   Move from S0 to S20 according to the transition condition 0.

2. Alternative divergence:
   Move from S0 to S20 and S21 by different transition condition 0 and 1.

3. Simultaneous divergence:
   Move from S0 to S20 and S21 by the same transition condition 0 simultaneously.



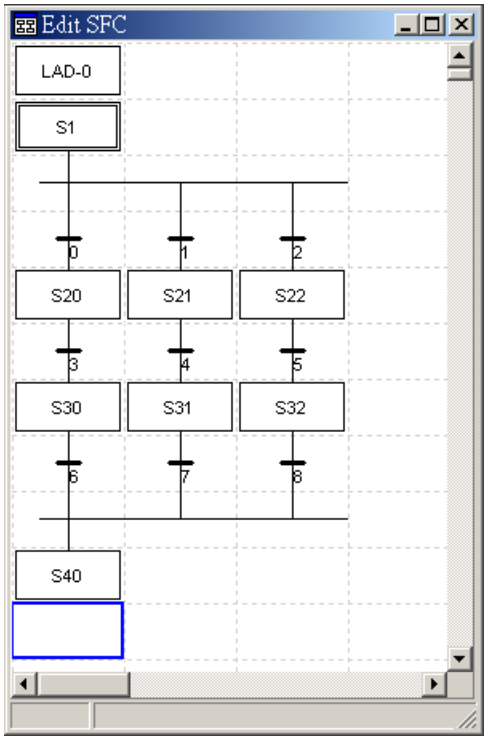
Step 9: If the divergence is consisted of more than two points, users can press function keys (Shift) + (F1~F9) to add more points for the divergence.

( : Auxiliary line for simultaneous divergence diagram,  ,  : Auxiliary line for simultaneous connection diagram,  : Auxiliary line for alternative divergence diagram,  ,  : Auxiliary line for alternative connection diagram)

Step 10: After divergence, if you have to converge the step points, use alternative convergence of condition diagram (press the function key [F7], or click the icon  on SFC toolbar) for alternative connection and use simultaneous convergence diagram (press the function key [F9], or click the icon  on SFC toolbar) for simultaneous connection. After that, users can then edit the internal program of every step point diagram. Move the editing block to where the initial step point diagram located, and right click your mouse to select the “Inner Ladder Mode” from the pop-up menu (Refer to Step 2 and Step 3).

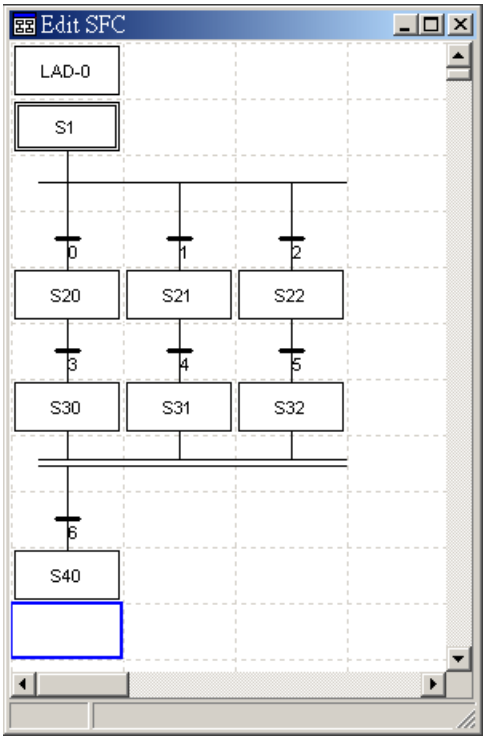
1. Alternative convergence:

Move from S30, S31, and S32 to the same step point, S40 according to the individual transition condition.



2. Simultaneous convergence:

Move from S30, S31, and S32 to the same step point, S40 according to the same transition condition.



Step 11: If the convergence is consisted of more than two points, users can press function keys (Shift) + (F1~F9) to add more points for the convergence.

( : Auxiliary line for simultaneous convergence diagram,  ,  : Auxiliary line for simultaneous connection diagram,  : Auxiliary line for alternative convergence diagram,  ,  : Auxiliary line for alternative connection diagram)

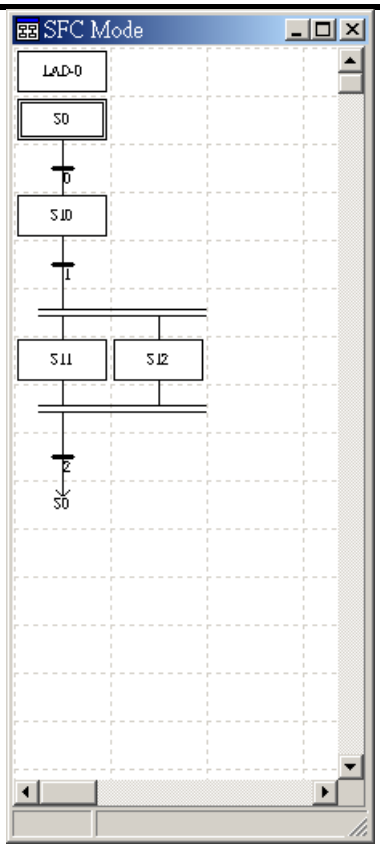
※Quick memory: 1. Alternative divergence and convergence: Move from one step point according to one transition condition.

2. Simultaneous divergence and convergence: Move from several step points according to one transition condition.

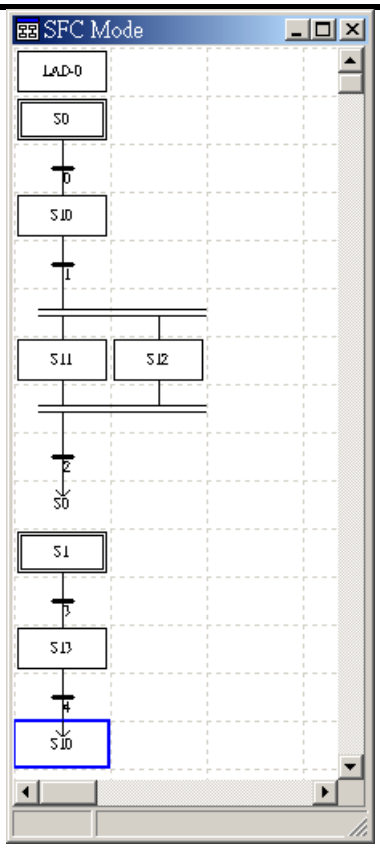
Step 12: When edit the SFC diagram, the downward step point that is sequenced in order could be connected by using common SFC diagram (press the function key [F3] or click the icon  on SFC toolbar). However, if step point jump up and down to the point that is not sequenced in order, or return back to the initial step point, or jump between different program processes, use the Jump Diagram (press the function key [F4], or click the icon  on SFC toolbar). The device number of every common step point diagram and initial step point diagram could only show up for one time when editing the SFC diagram.

1. The step point S10, S11 and S12 is sequenced in order, and therefore, they can be connected by using common SFC diagram. But, if users want to return back to S0 from S13, and then users have to use the “Jump Diagram” to complete the transition.

2. If users want to move from S20 within the procedure of S1 to S10 within the procedure of S0, and then users have to use the “Jump Diagram” to complete the transition.



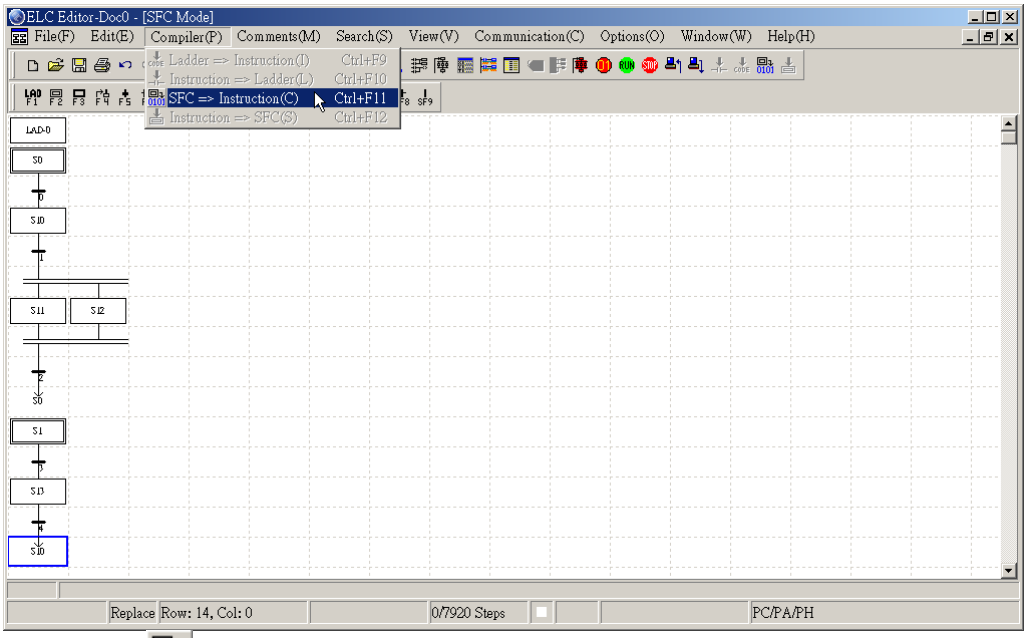
Return to initial step point, S0 in the same procedure.



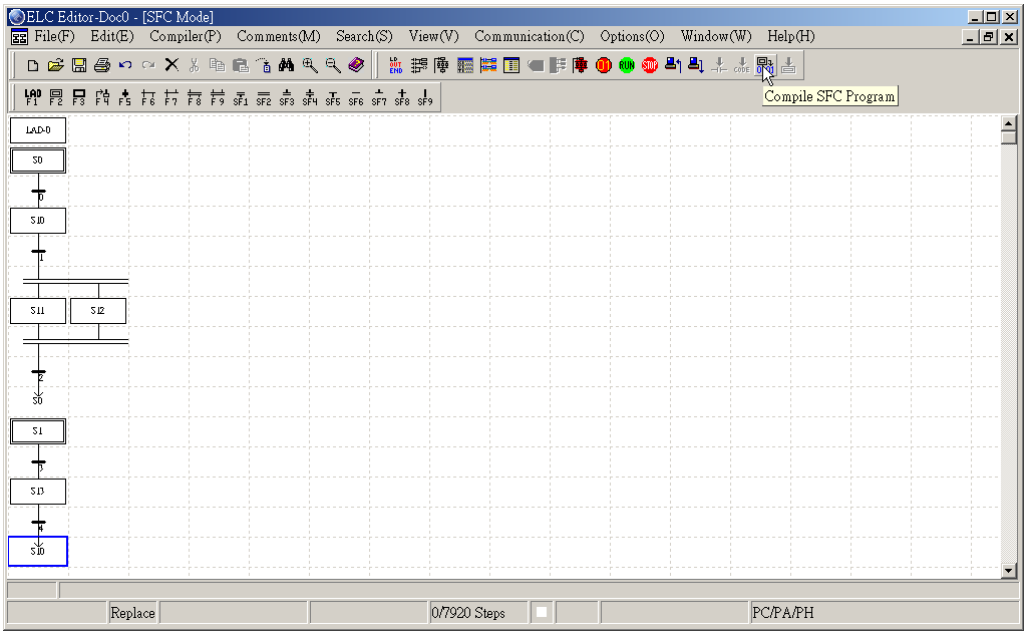
Transition of SFC diagrams in two different procedures.

Step 13: After the SFC diagram is completed, users can convert the SFC diagram into the instruction code through compiling. From the menu bar, click “Compiler” > ” SFC=> Instruction (C)”, or click the icon  on toolbar, or use keyboard shortcuts by pressing keys (Ctrl) + (F11).

1. Click “Compiler” > ” SFC=> Instruction (C)” from the menu bar to convert the SFC diagram into the instruction code.



2. Click the icon  on toolbar to convert the SFC diagram into the instruction code.



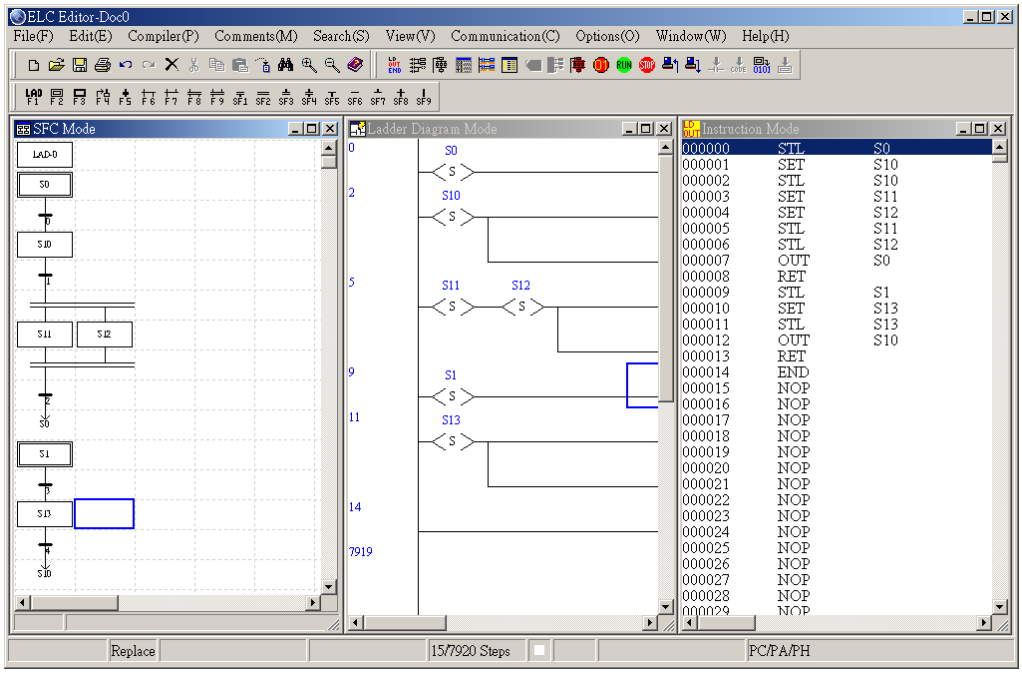
8.3 SFC Editing Explanation

Convert SFC Diagram into Instruction Code through Compiling: (if want to correctly display the compiling ladder diagram, it is needed to convert the SFC diagram into the instruction code through compiling first, and then convert the instruction code into ladder diagram through compiling)

Example of the simultaneous divergence and simultaneous convergence procedures

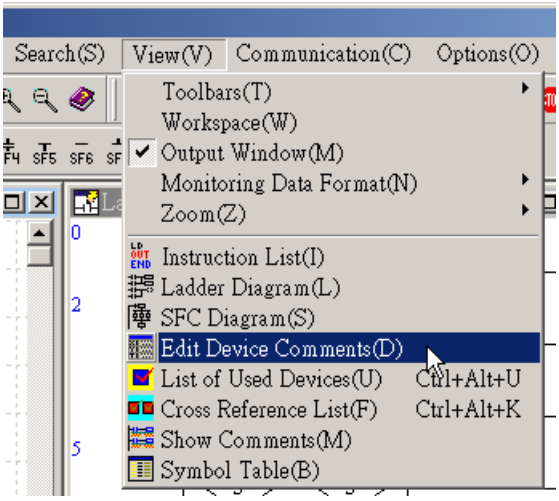
1.→ The SFC diagram is compiled and converted to the instruction code,

2.→ The instruction code is compiled and converted to the ladder diagram

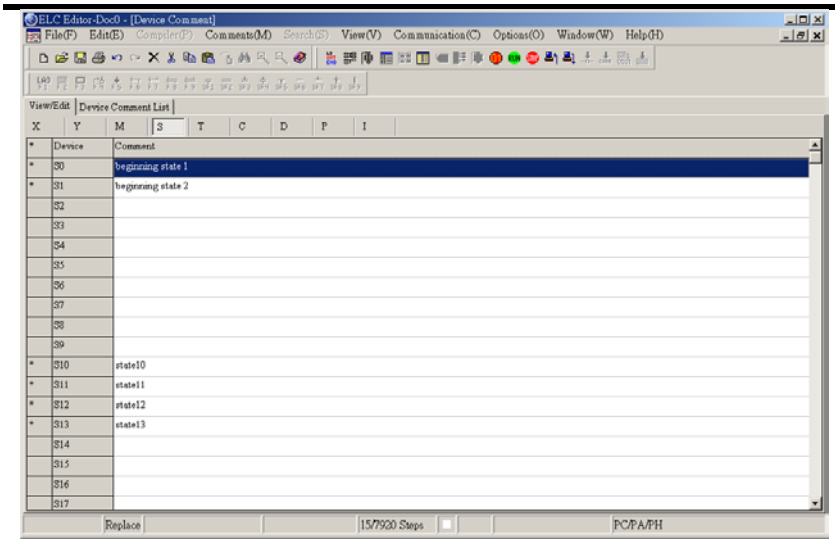


■ Editing Device Comment in SFC Mode:

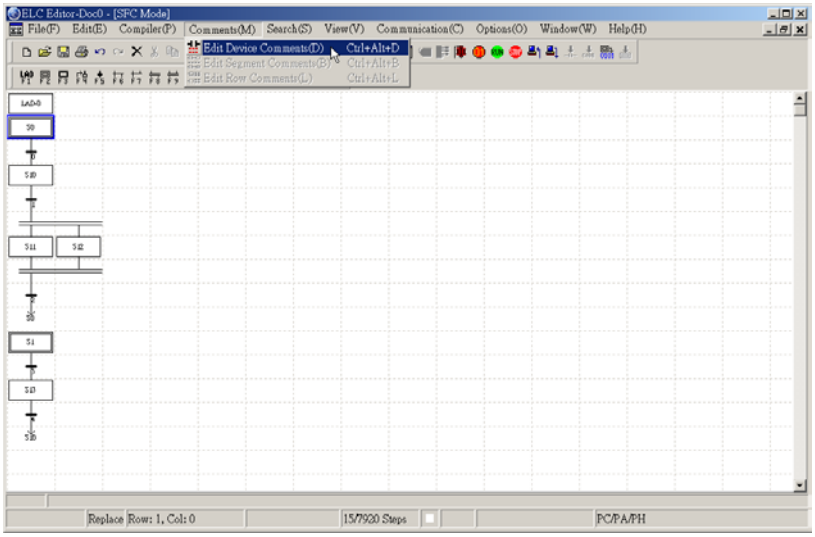
The device S represents the step point within the SFC diagram, and therefore, the comments of step point are the comments of device S.



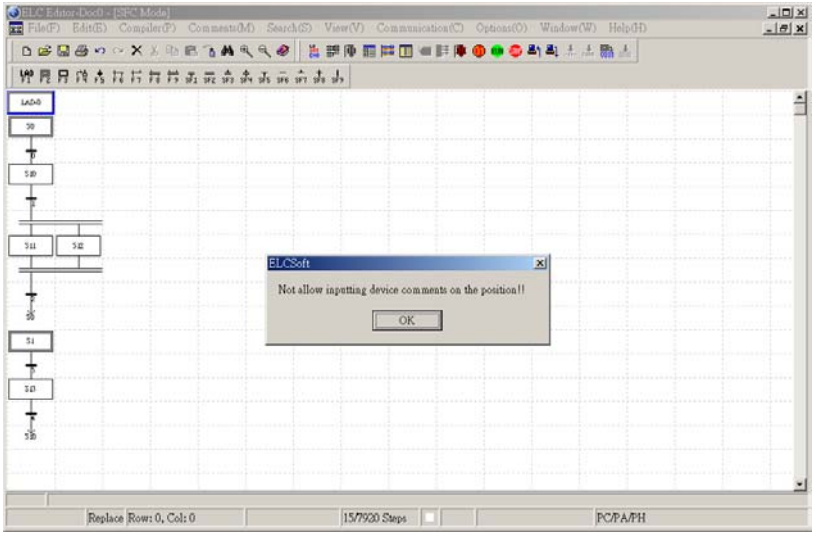
In SFC mode, you can click “View” from menu bar, and click “Edit Device Comments(D)” from the pull-down menu. Then, you can edit several device comments at the same time.



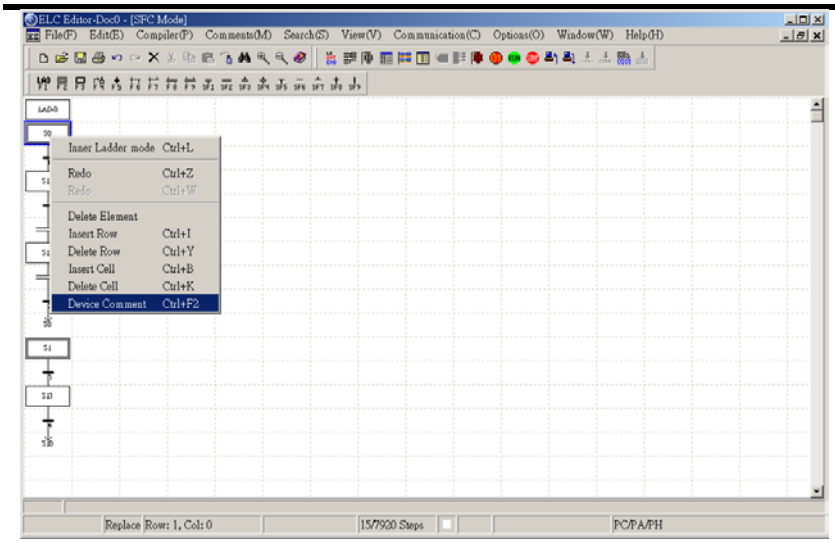
In “Device Comment” window, select the device type “S”, and double click your mouse on the device number that you want to edit, or use “Up” and “Down” key to select the target device and enter the comments. After comments is edited and completed, press Enter key on your keyboard to save the comments.



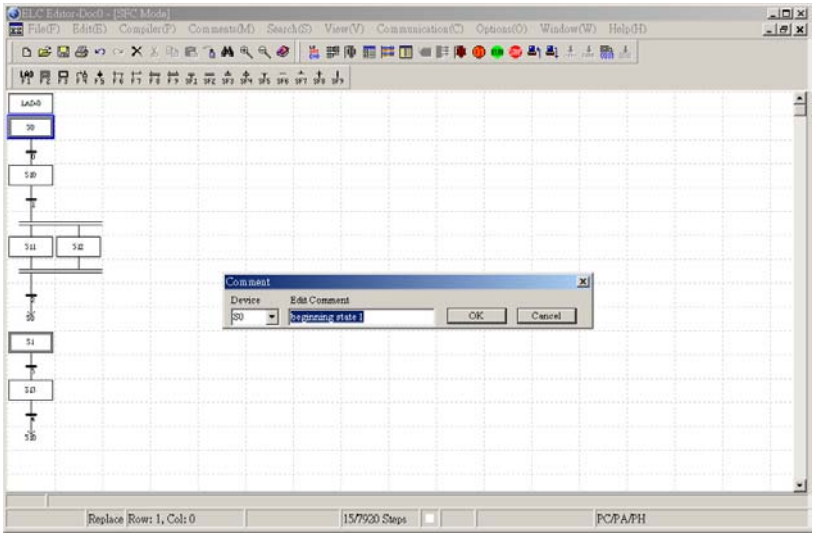
To edit the device comments, you can also click “Comment” from menu bar, and click “Edit Device comments(D)” from the pull-down menu, or use keyboard shortcuts by pressing keys (Ctrl) + (Alt) + (D).



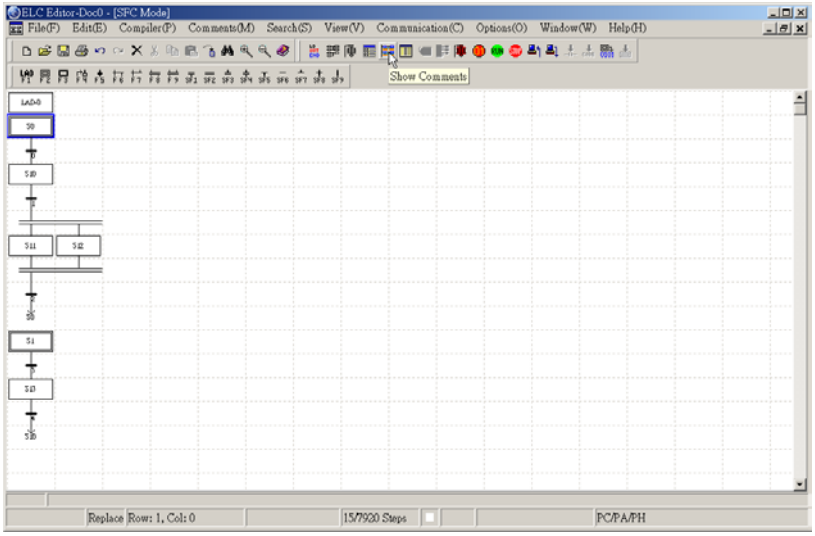
If the position of the editing block is not allowed to input the device comments in it, a message dialog box, “Inhibit to input device comments on the position!!” will pop up.



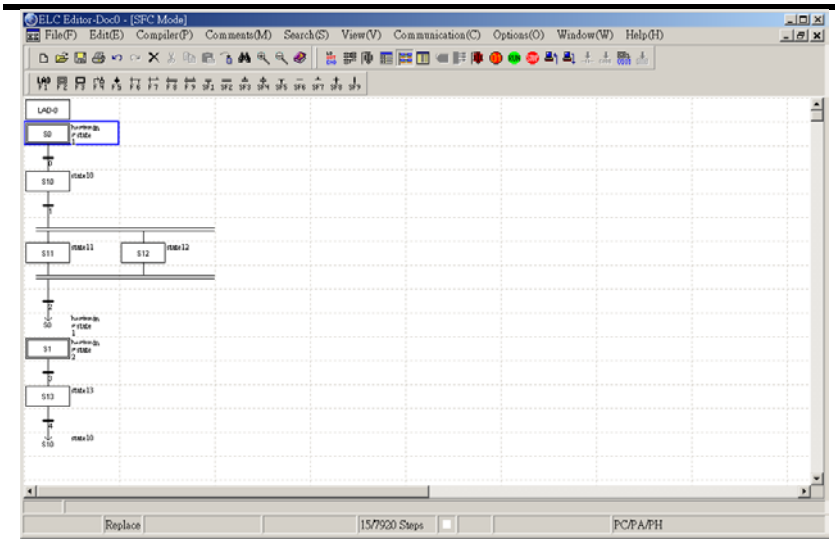
Place the editing block on the step point that you want to edit device comments in it, and then right click your mouse to select the “Device comment” command from the pop-up menu.



After select the “Device comment” command from the pop-up menu, the “Comment” window will appear for you to edit the device comments. After the comments is edited and completed, click the button “OK” or press Enter key on your keyboard to close the window.



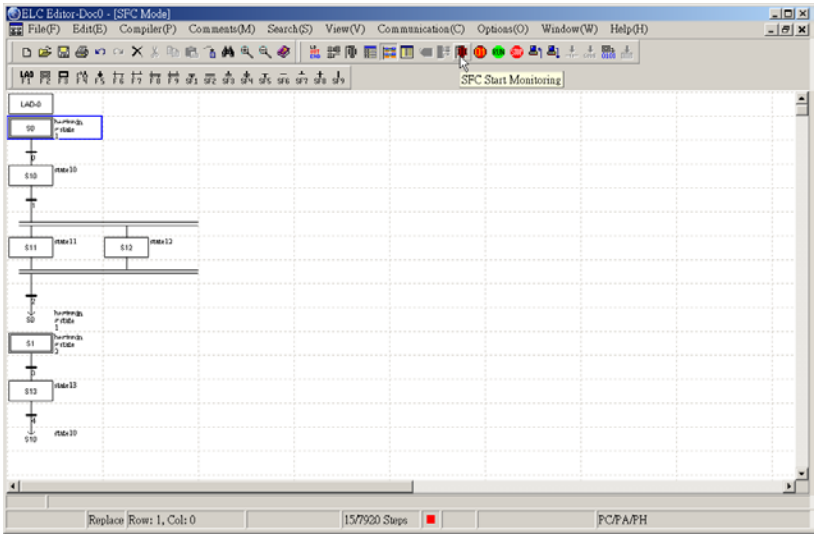
Click the icon  on toolbar or click “View” from menu bar, and click “Show Comments(M)” command from pull-down menu to have the device comments be shown on the SFC diagram.



The device comments will be shown on the right-hand side of the SFC diagram.

■ Monitoring in SFC Mode:

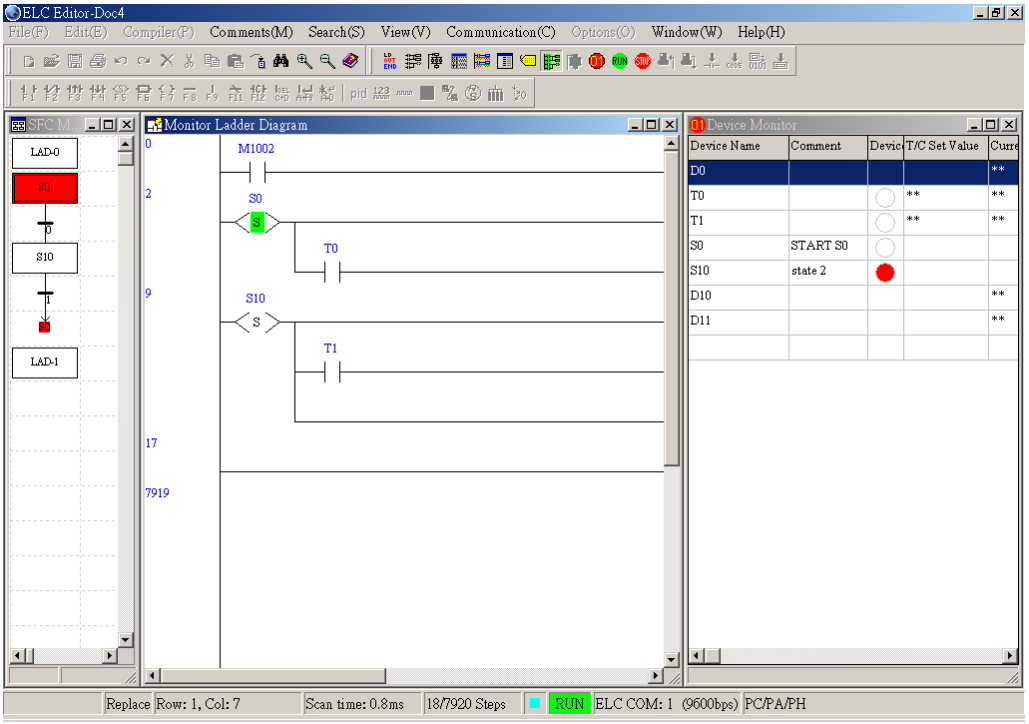
ELCSoft allows users to monitor the execution conditions of the programs in the SFC mode.



Click the icon  on toolbar, or click “communication” from menu bar, and click “SFC Start Monitoring” command from pull-down menu. Then, you can start the monitoring based on the program conditions in SFC mode.

There are three monitor functions can be run simultaneously in ELCSoft:

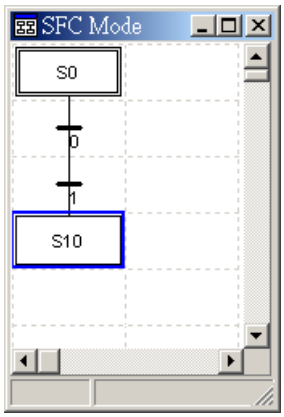
1. SFC mode monitor, 2. Ladder diagram monitor, 3. Device monitor.



■ Examples of Frequent Error SFC Diagrams:

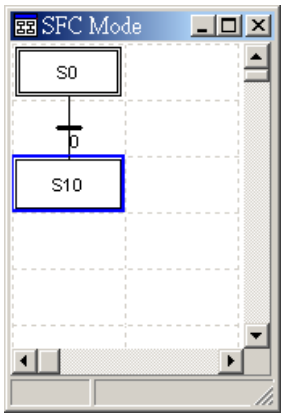
Error SFC diagram

1. There are two consecutive transition condition diagrams connected between two step points.



Revised (Correct) SFC diagram

There should be only one transition condition diagram connected between two step points.

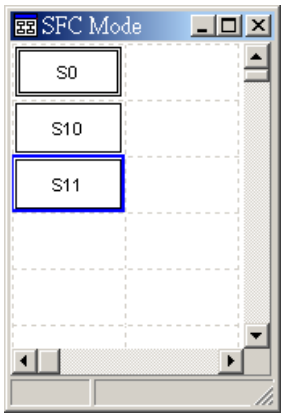


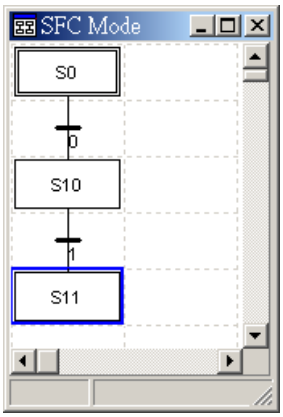
Error SFC diagram

2. There is no transition condition diagram connected between step point S0 and other step points.

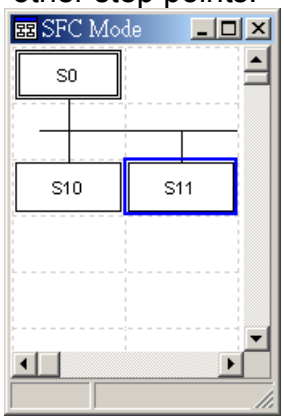
Revised (Correct) SFC diagram

There should be transition condition diagrams connected between step point S0 and other step points.

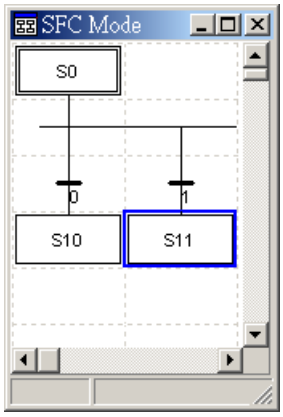




3. After the alternative divergence, there is no transition condition diagram connected between step point S0 and other step points.

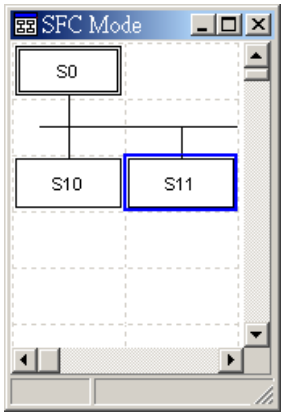


After the alternative divergence, there should be transition condition diagrams connected between step point S0 and other step points.



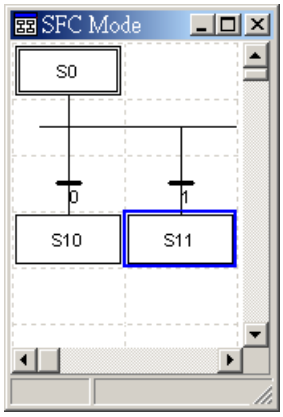
Error SFC diagram

4. It is a wrong connection if the alternative divergence of condition diagram is connected after one transition condition diagram.

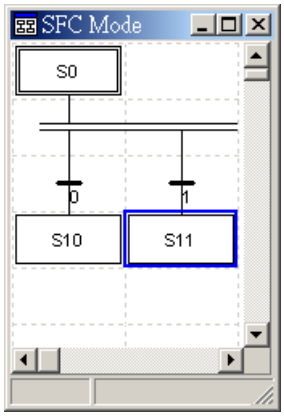


Revised (Correct) SFC diagram

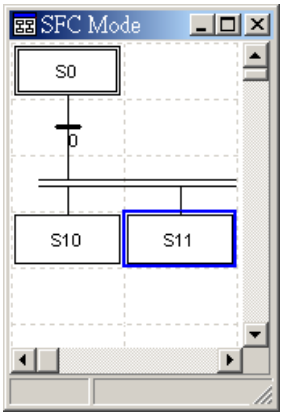
To make a correct connection, use the alternative divergence of condition diagram first, and then use condition diagrams to connect other step points as the figure shown below.



5. It is a wrong connection if the condition diagram is connected after the simultaneous divergence diagram.

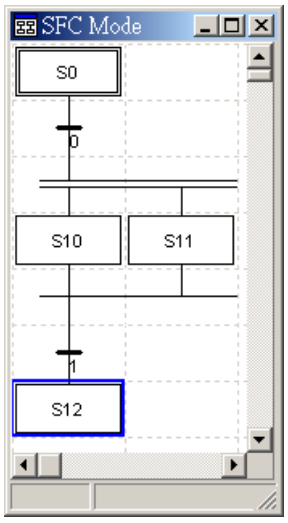


To make a correct connection, use the condition diagram first, and then use simultaneous divergence diagram to connect other step points as the figure shown below.



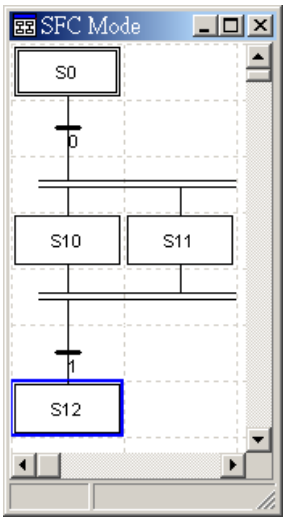
Error SFC diagram

6. Before alternative convergence diagram, the individual transition condition diagrams of the step points should exist.

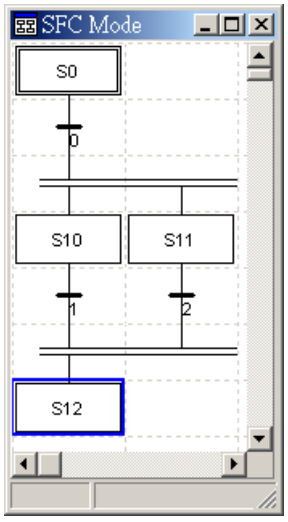


Revised (Correct) SFC diagram

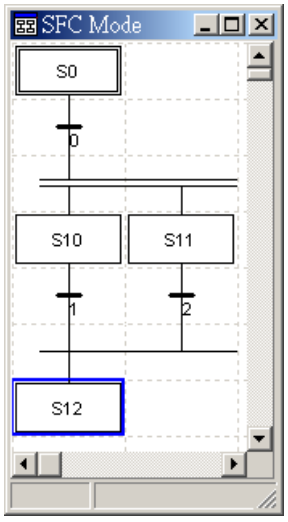
To make a correct connection, use the simultaneous convergence diagram as the figure shown below.



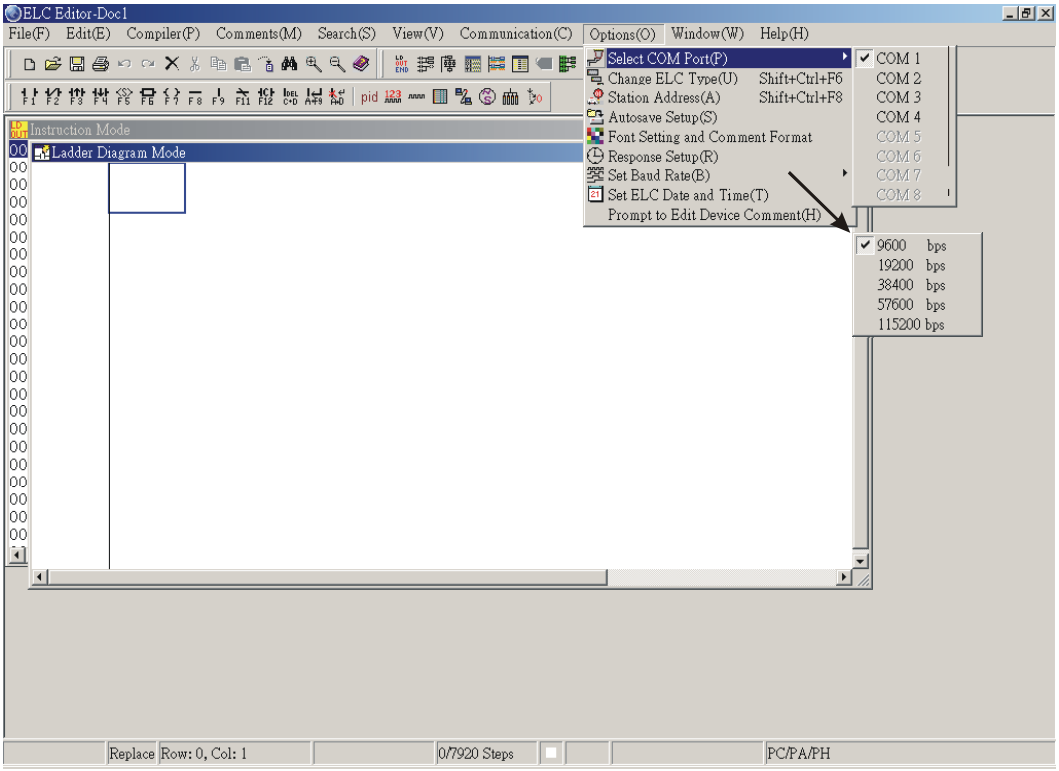
7. Before simultaneous convergence diagram, the individual transition condition diagrams of the step points should not exist. However, the individual transition condition diagrams of the step points should be connected after the simultaneous convergence diagram.



To make a correct connection, use the alternative convergence diagram as the figure shown below.



The figure below shows “Options” menu screen. The “Options” menu functions will be described as follows:



9.1 Select COM Port(P)

ELCSoft will detect applicable PC COM port and allow user to choose one of applicable COM port (COM1 ~ COM8) to connect to ELC.

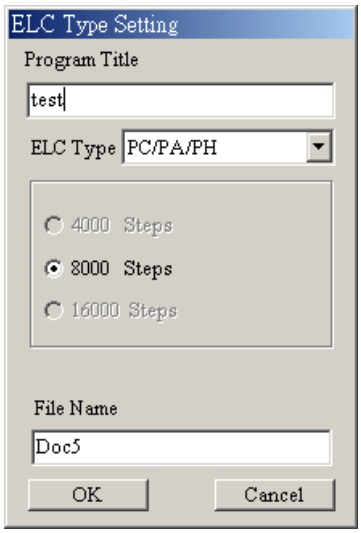
◈ Method: Click “Option” > “Select COM port(P)”

9.2 Change ELC type(U)

ELCSoft allows user to set the program title, ELC model setting (PB and PC/PA/PH), program capacity (4000, 8000, 16000 Steps) and the file name.

◈ Method 1: Click “Options” > “Change ELC type(U)”

◈ Method 2: Use keyboard shortcuts by pressing keys (Shift) + (Ctrl) + (F6)

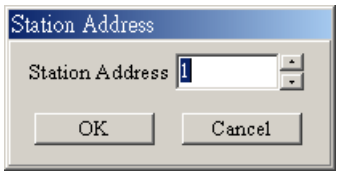


9.3 Station Address(A)

The default address of ELCSoft is 1. It means that PC connects to ELC, which the address is 1 (D1121). The setting range is from 0 to 255.

◈ Method 1: Click “Options” > “Station Address(A)”

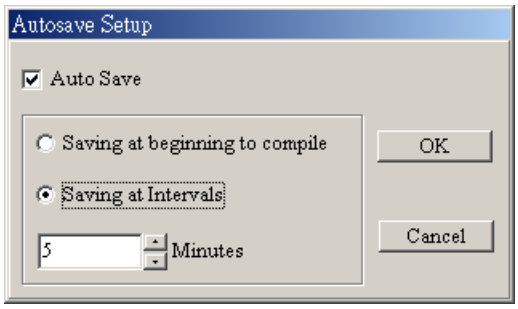
◈ Method 2: Use keyboard shortcuts by pressing keys (Shift) + (Ctrl) + (F8)



9.4 Autosave Setup(S)

ELCSoft can save files automatically when editing programs. The autosave files will be stored in the folder named UserTemp. User can choose to autosave the files before compiling or by time interval (5 to 60 minutes).

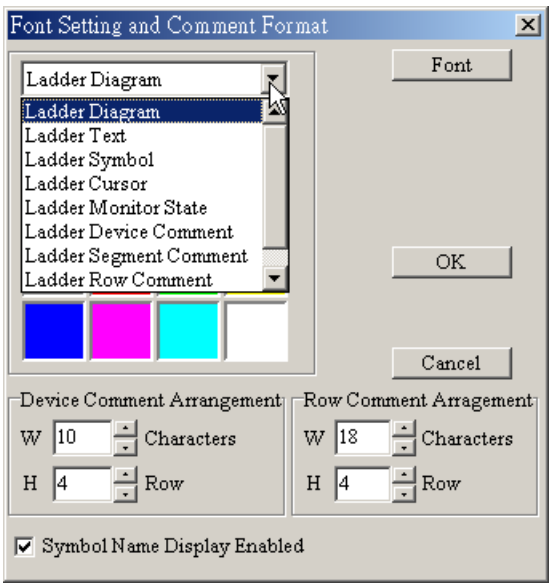
◈ Method: Click “Options” > “Autosave Setup(S)”



9.5 Font Setting and Comment Format

ELCSoft provides the default 16-color palette for user to color the ladder diagram, , ladder text, ladder symbol, ladder cursor, ladder monitor state, ladder device comment, ladder segment comment, ladder row comment and ladder monitor value. It also provides those fonts that Windows® uses. The text of device comment and row comment also can be arranged in this setting. It also provides symbol name display enabled or disable..

◈ Method: Click “Options” > “Font Setting and Comment Format”



⊙.symbol name display enabled or disable

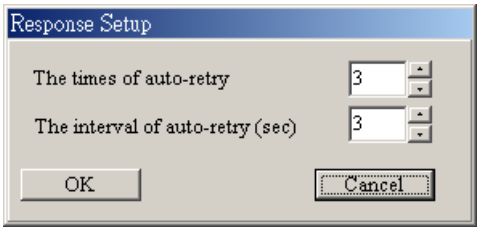
◈ Method 1: Click “Options” > “ Font Setting and Comment Format” choice symbol name display enabled.

◈ Method 2: Click the icon on the toolbar.

9.6 Response Setup(R)

This function is used to set the auto query times (1~50 times) and query interval time (3~10 seconds) if a transmission error occurs when communicate PC with ELC.

◈ Method: Click “Options” > “Response Setup(R)”



9.7 Set Baud Rate(B)

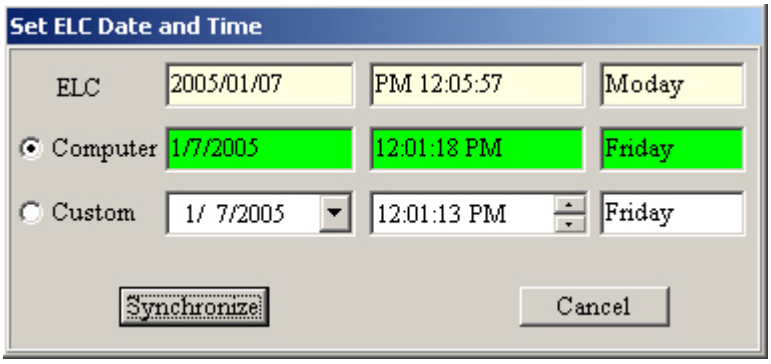
ELCSoft allows users to set the communication baud rate of ELC-PC/PA/PH series. The communication baud rate of ELC-PC/PA/PH series can be 9600, 19200, 38400, 57600 and 115200 bps.

◈ Method: Click “Options” > “Set Baud Rate(B)”

9.8 Set ELC Date and Time(T)

ELC-PC/PA/PH series supports RTC function that allows users can define the ELC date and time by themselves. In addition, this function also lets users set ELC date and time to be the same as the date and time of PC.

◈ Method: Click “Options” > “Set ELC Date and Time(T)”

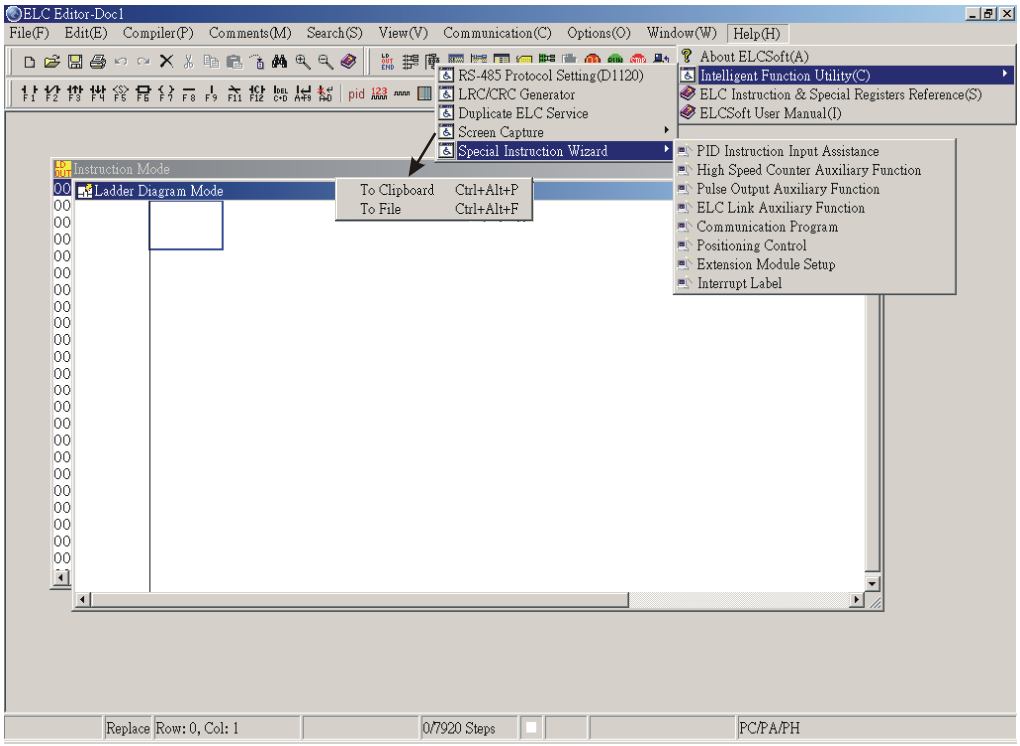


9.9 Prompt to Edit Device Comment(H)

When this function is enabled, the comment input dialog box will pop up to remind users to edit the device comments after users edit ELC programs by entering instructions directly in the instruction mode or ladder diagram mode.

◈ Method: Click “Options” > “Prompt to Edit Device Comment”

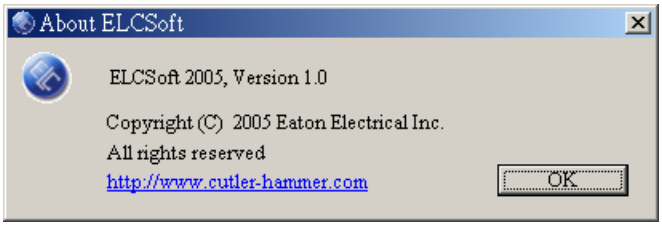
The figure below shows the “Help” menu screen. The “Help” menu functions will be described as follows:



10.1 About ELCSoft(A)

Display Delta website, ELCSoft program version, serial number and copyright.

◈ Method: Click “Help” > “About ELCSoft(A)”



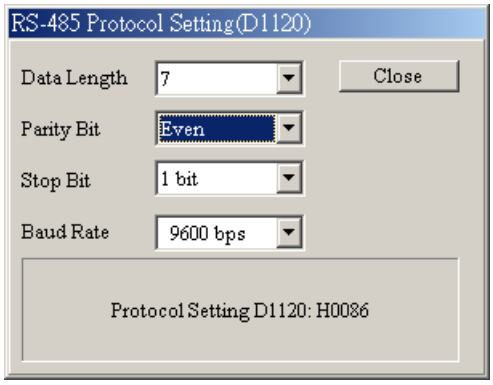
10.2 Intelligent Function Utility(C)

Provide functions that include RS-485 protocol setting(D1120) (MODBUS protocol value conversion), LRC and CRC generator, LRC/CRC generator, duplicate ELC service, screen capture and special instruction wizard.

◈ Method: Click “Help” > “Intelligent Function Utility(C)”

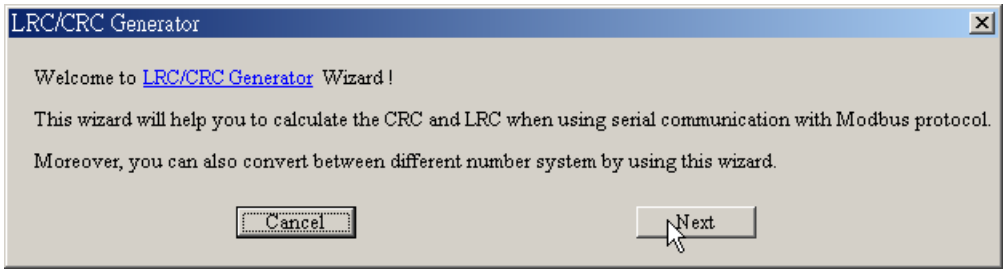
⊙ RS-485 protocol setting(D1120):

Use this command to set communication format, such as 9600,7,E,1.

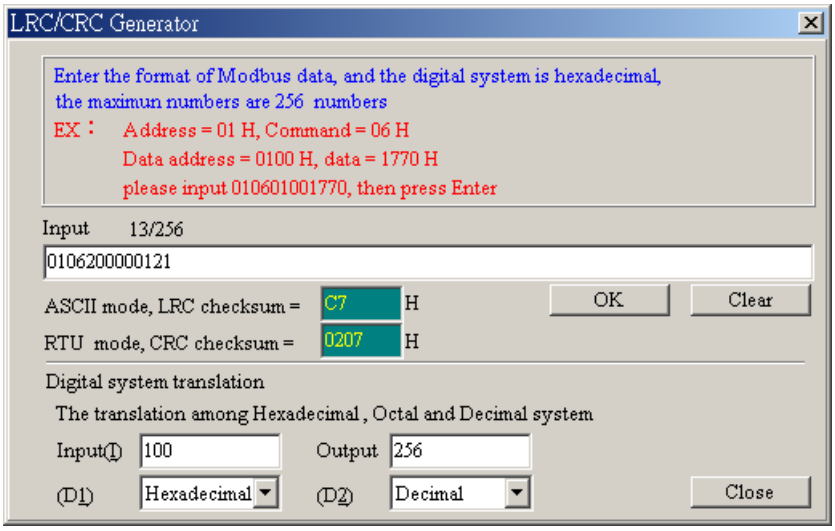


⊙ LRC/CRC generator

Step 1: Click “Next step”

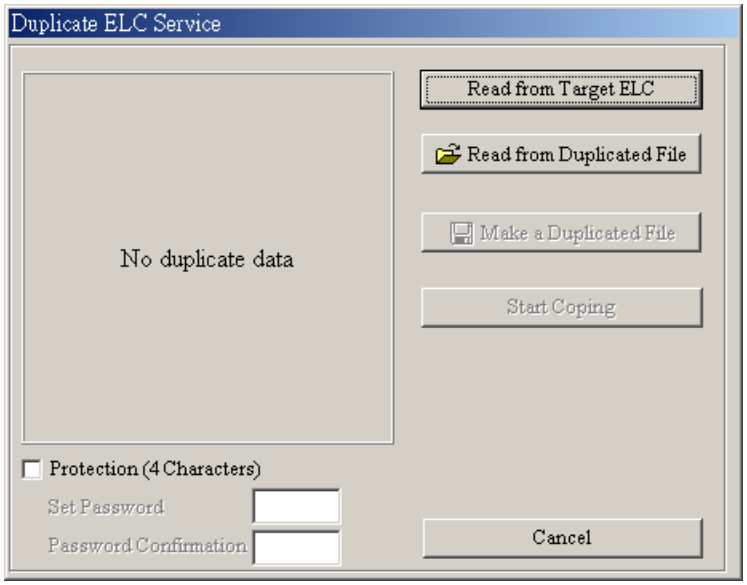


Step 2: You can enter the format of the MODBUS communication data, and the digital system is hexadecimal. The maximum numbers can be 256 numbers. If the input value is not an even number, an error message window will appear. Besides, you can execute the number base conversion in this dialog box.

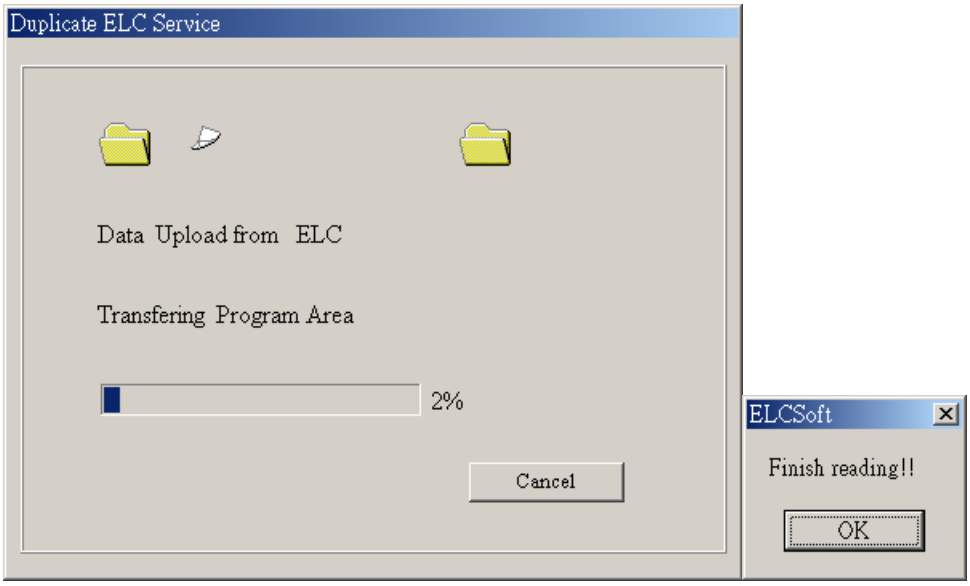


⊙ Duplicate ELC Service

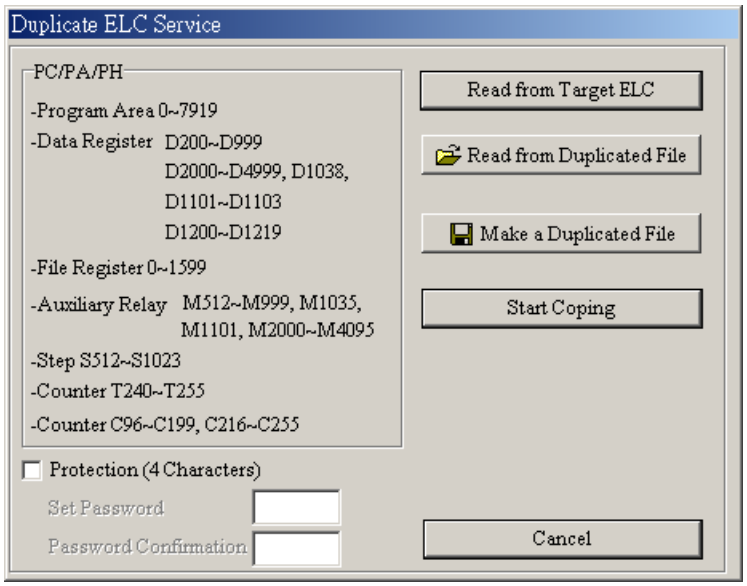
Step 1: Choose the button “Read from Target ELC”



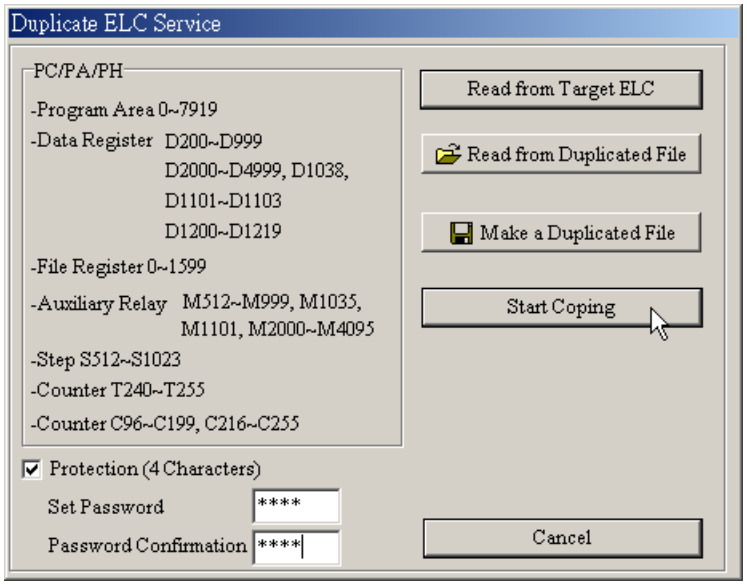
Step 2: Read the duplicated data from Target ELC. The duplicated data in target ELC includes programs, data registers, file registers, auxiliary relays, step points, timers and counters.

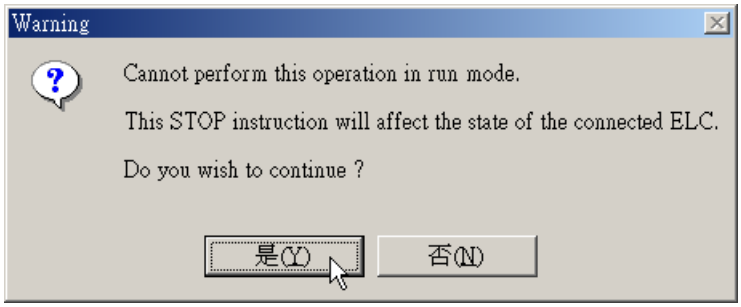


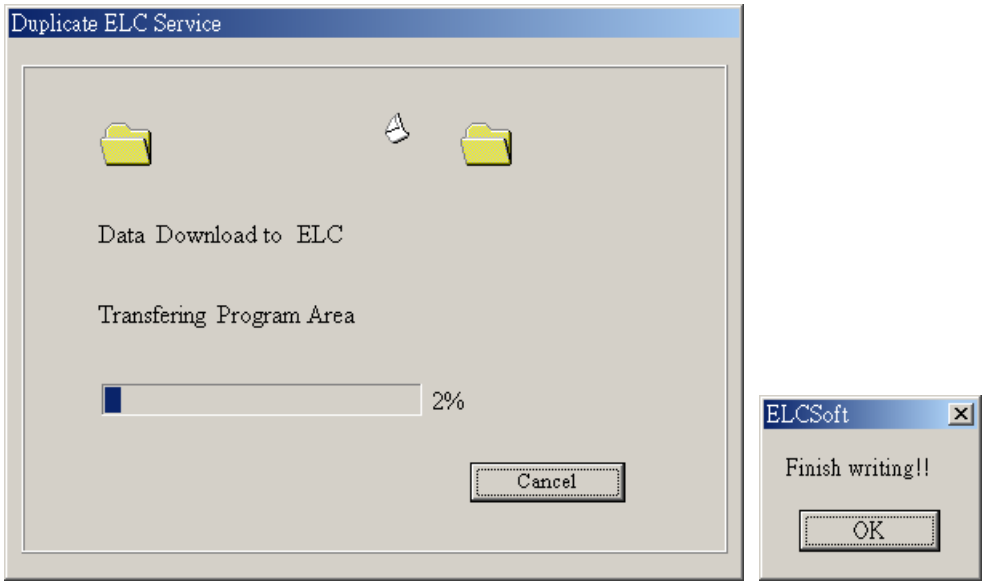
Step 3: After reading action is completed, Make the duplicated data. Be sure to specify the file name extension as ".DUP". You can read the DUP files by clicking the button "Read from Duplicated File" later.



Step 4: Enter new setting password and start to duplicate ELC file. At this time, the duplicated file and the password will both be written into ELC.







⊙ Screen Capture:

Save the current operating window of ladder diagram mode, instruction mode and SFC mode as an image file.

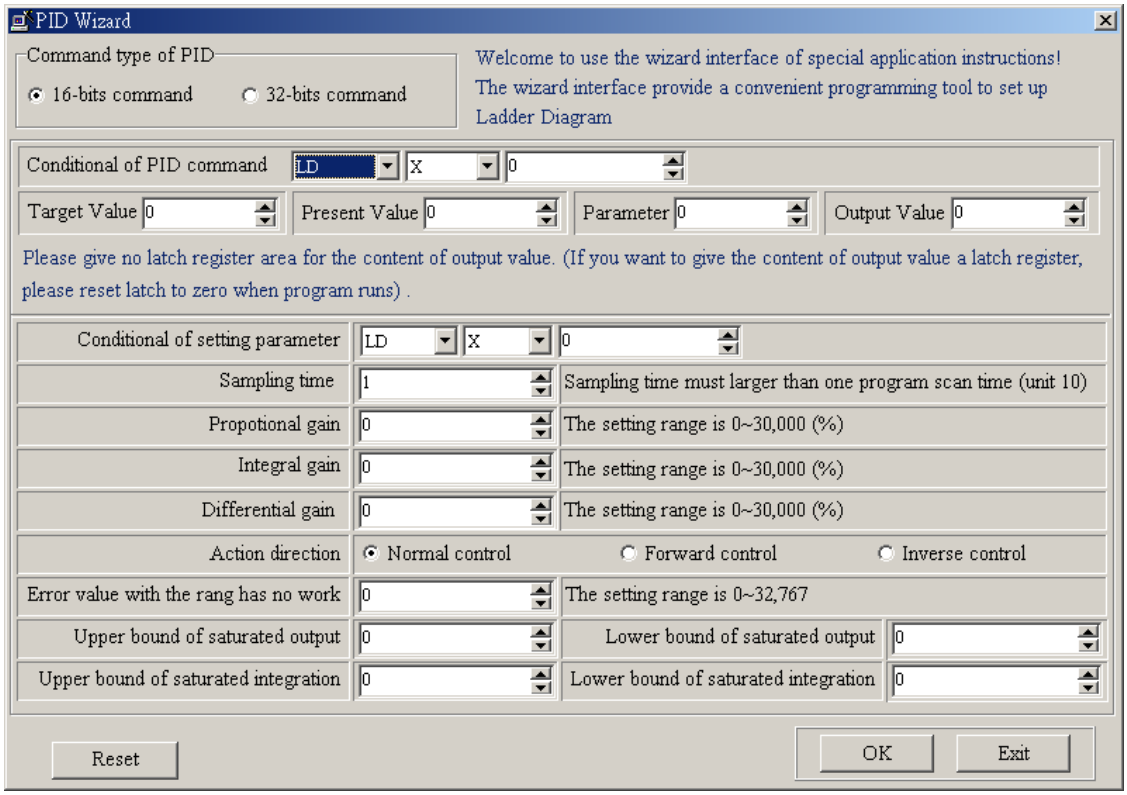
◆ To Clipboard: Click “Help” > “Screen Capture” > “To Clipboard” or using keyboard shortcuts by pressing keys (Ctrl) + (Alt) + (P).

◆ To File: Click “Help” > “Screen Capture” > “To File” or using keyboard shortcuts by pressing keys (Ctrl) + (Alt) + (F).

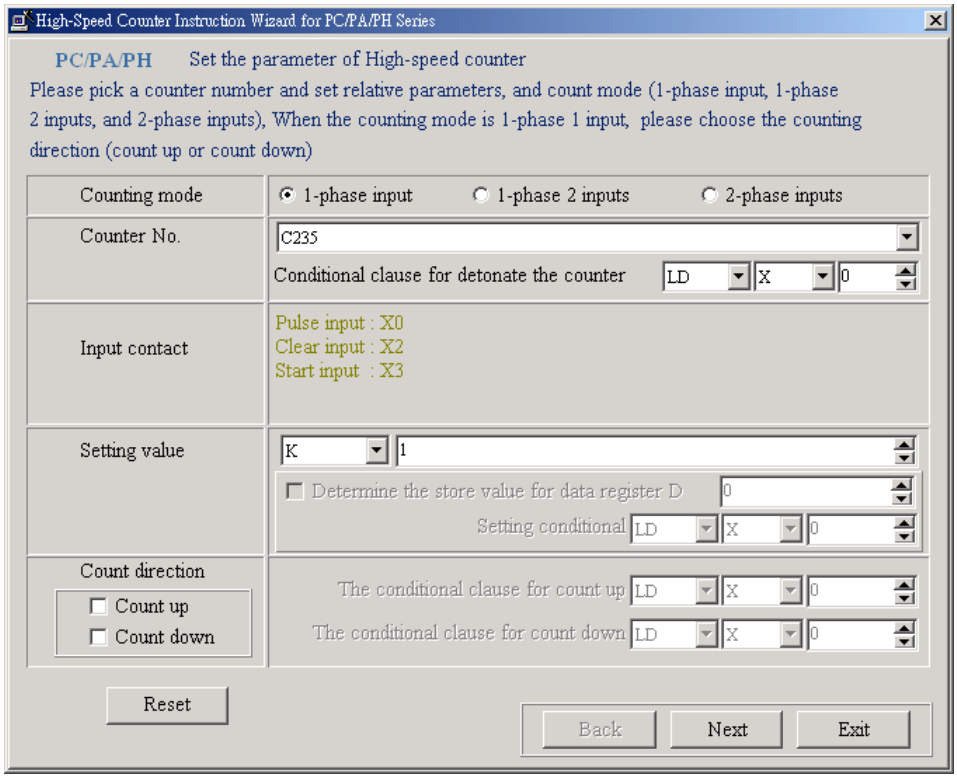
```
000000 LD       M1002
000001 MOV      H73       D1120
000006 RST      M1143
000009 RST      M1120
000012 LDP      X0
000015 ORP      X1
000018 ORP      X2
000021 ORP      X3
000024 ORP      X4
000027 SET      M1122
000028 LDP      X0
000031 END      K1        K500      K1
```

⊙ Special Instruction Wizard:

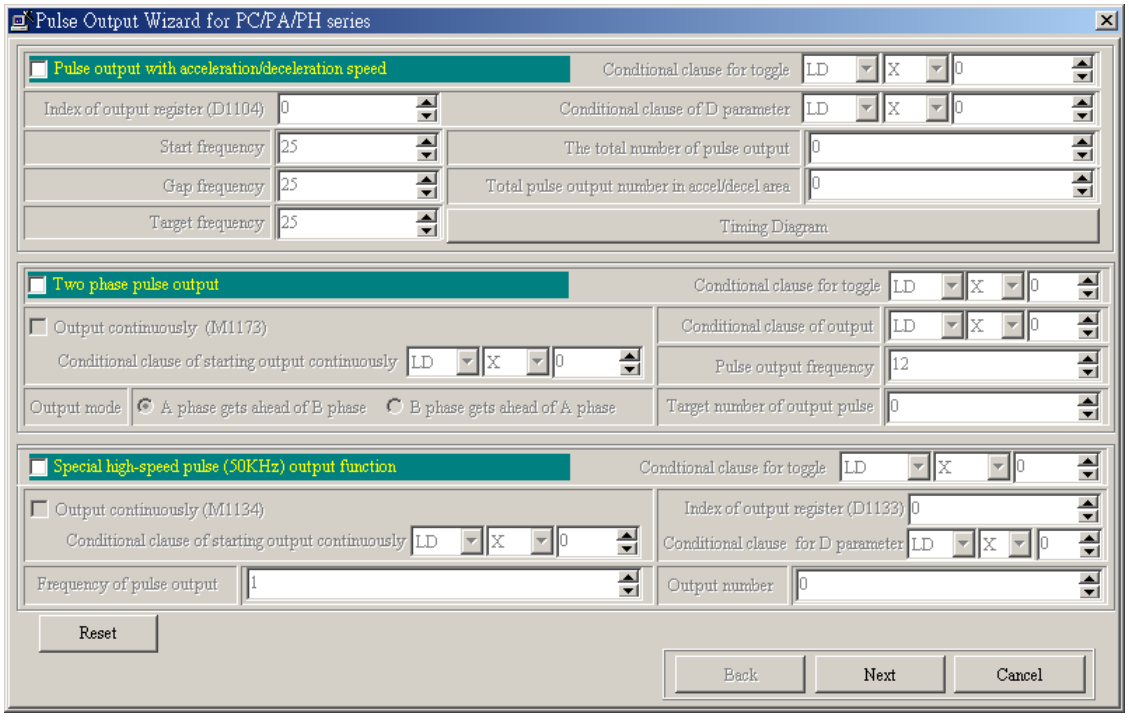
◆ PID Instruction Input Assistance



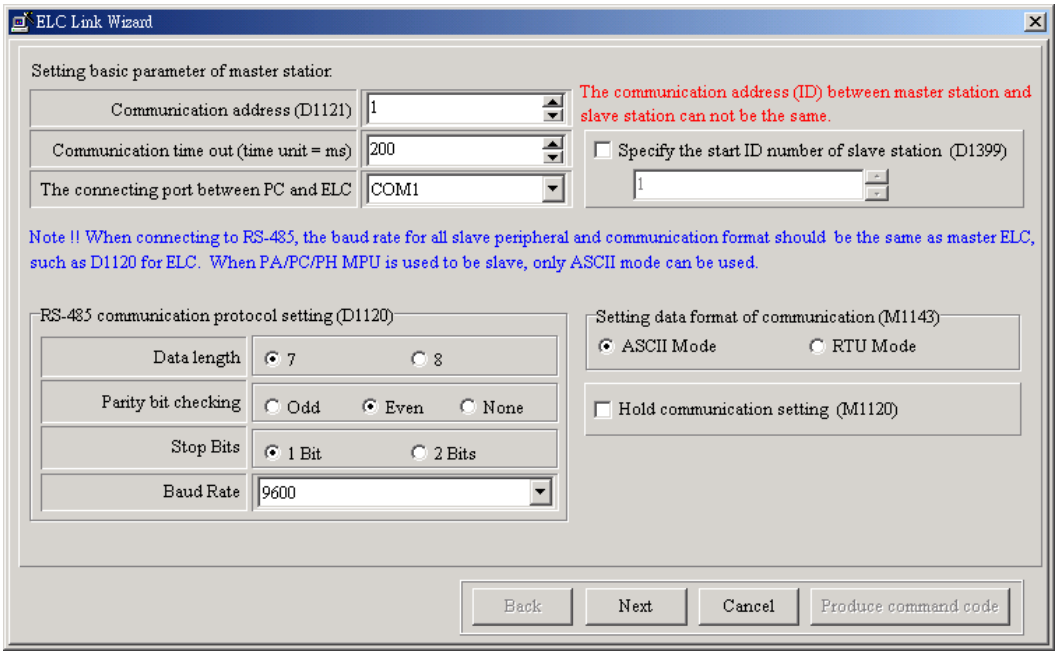
◆ High Speed Counter Auxiliary Function



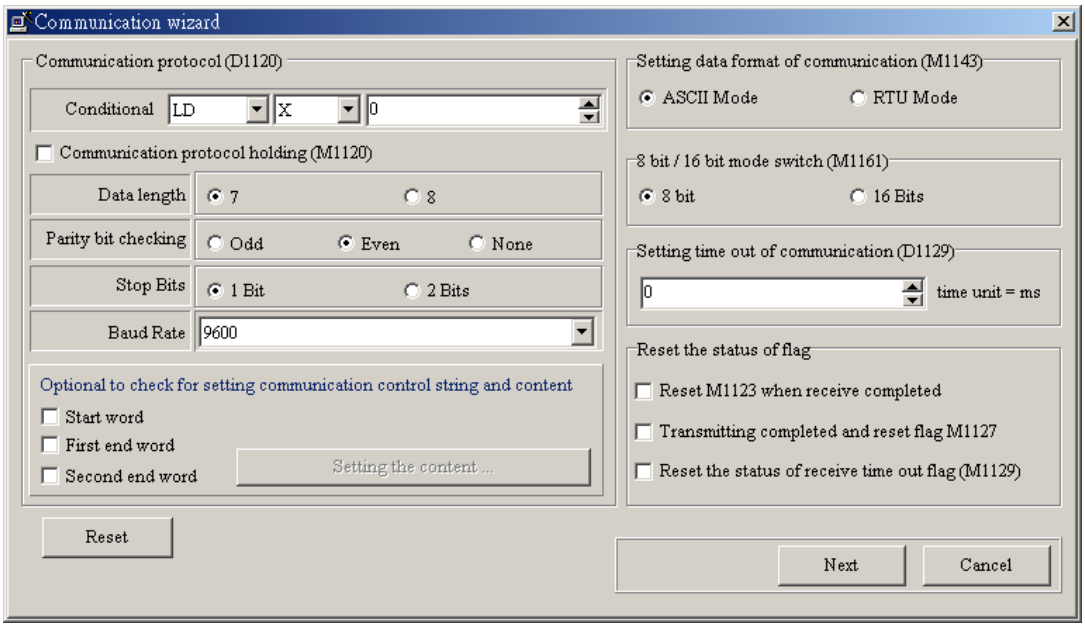
◆ Pulse Output Auxiliary Function



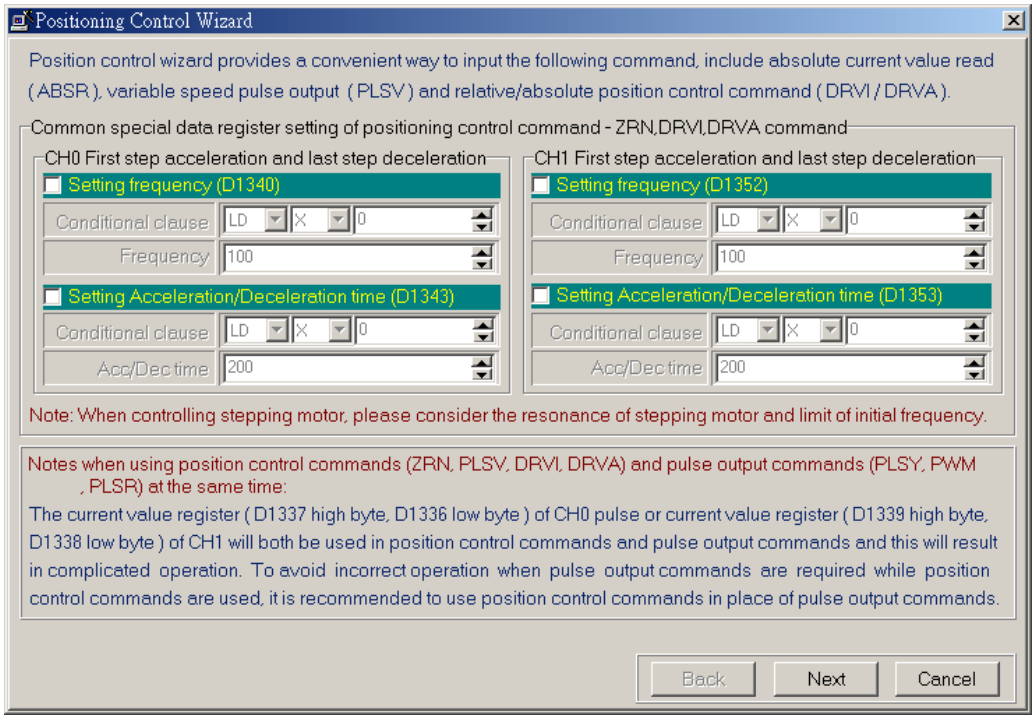
◆ ELC Link Auxiliary Function



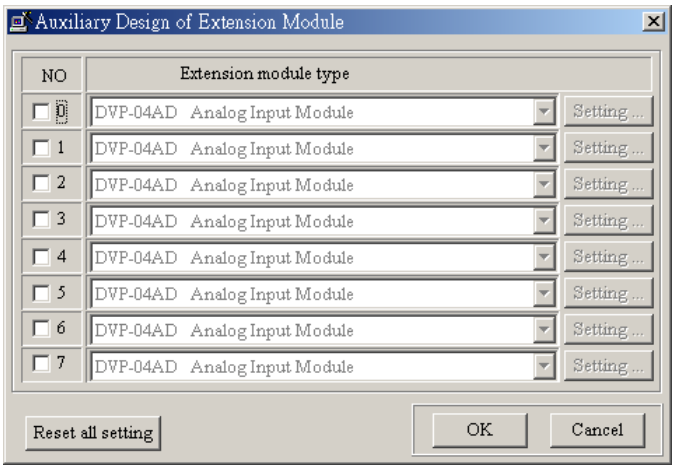
◆ Communication Program



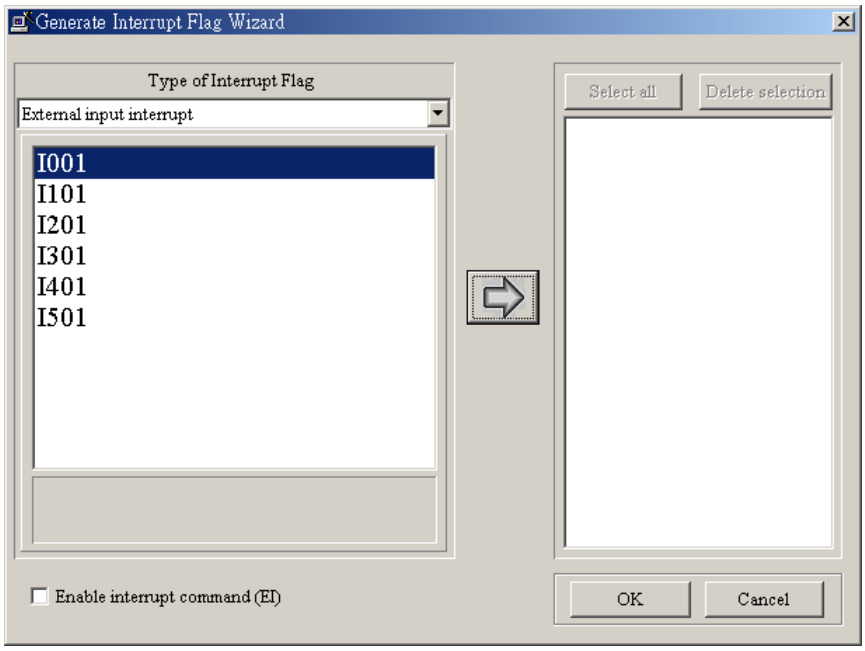
◆ Position Control



◆ Extension Module Setup



◆ Interrupt Label



10.3 Reference Documents

■ ELC Instruction & Special Registers Reference(S) ⇨ all instructions list and explanation, the manual for internal special auxiliary relay of all ELC series and the manual for internal special data register of all ELC series.

◈ Method: Click “Help” > “ELC Instruction & Special Registers Reference(S)”

■ ELCSoft User Manual(I) ⇨ User Manual for ELCSoft,

◈ Method: Click “Help” > “ELCSoft User Manual(I)”

Data 1: Keyboard Operation Keys and Shortcuts

User can use the keyboard to select any menu command on the menu bar and on a toolbar. The following tables summarize the available Keyboard operation keys and shortcuts for ELCSoft. Most of the keyboard shortcuts are displayed on the right-hand side of each menu command when you pull down the menu.

Keyboard Operation Keys	
Functions	Operation Keys (Keyboard Shortcuts)
Move editing block up	[↑]
Move editing block down	[↓]
Move editing block left	[←]
Move editing block right	[→]
Move editing block to the front of the row	[Home]
Move editing block to the end of the row	[End]
Delete the symbol on the left of the editing block	[← Backspace]
Move to the next page	[Page Down]
Move to the previous page	[Page Up]
Cancel, quit or close the selected function	[Esc]

Ladder Diagram Toolbar		
Functions	Operation Keys (Keyboard Shortcuts)	Icon
Normally open contact	[F1]	
Normally closed contact	[F2]	
Rising pulse	[F3]	

Ladder Diagram Toolbar		
Functions	Operation Keys (Keyboard Shortcuts)	Icon
Falling pulse	[F4]	
Step point	[F5]	
Application instruction	[F6]	
Output coil	[F7]	
Horizontal line	[F8]	
Vertical line (cursor will not move)	[F9]	
Reverse operation results	[F11]	
Compare instruction	[F12]	
Delete vertical line	[Ctrl] + [D]	
Draw vertical line and cursor move down	[Alt] + [F9]	

SFC Toolbar		
Functions	Operation Keys (Keyboard Shortcuts)	Icon
Common ladder	[F1]	
Initial diagram of SFC	[F2]	
Common SFC	[F3]	
Jump diagram	[F4]	
Condition diagram	[F5]	
Divergence of condition diagram	[F6]	
Convergence of condition diagram	[F7]	

SFC Toolbar		
Functions	Operation Keys (Keyboard Shortcuts)	Icon
Divergence diagram	[F8]	
Convergence diagram	[F9]	
Auxiliary line for simultaneous divergence diagram	[Shift] + [F1]	
Auxiliary line for simultaneous connection diagram	[Shift] + [F2]	
Auxiliary line for simultaneous convergence diagram	[Shift] + [F3]	
Auxiliary line for simultaneous connection diagram	[Shift] + [F4]	
Auxiliary line for alternative divergence diagram	[Shift] + [F5]	
Auxiliary line for alternative connection diagram	[Shift] + [F6]	
Auxiliary line for alternative convergence diagram	[Shift] + [F7]	
Auxiliary line for alternative connection diagram	[Shift] + [F8]	
Auxiliary line for vertical-line connection diagram	[Shift] + [F9]	

Menu bar and General Toolbar			
File Menu Functions	Operating Procedure	Operation Keys (Keyboard Shortcuts)	Icon
Create a new file	“File” > “New(N)”	[Ctrl] + [N]	
Open an old file	“File” > “Open(O)”	[Ctrl] + [O]	
Save a editing file	“File” > “Save(S)”	[Ctrl] + [S]	
Save current file to other file name or project	“File” > “Save As(A)”	[Ctrl] + [Alt] + [S]	
Close current editing file	“File” > “Close(C)”	--	
Print current editing file, i.e. instruction / ladder diagram/ comments…	“File” > “Print(P)”	[Ctrl] + [P]	

Menu bar and General Toolbar			
File Menu Functions	Operating Procedure	Operation Keys (Keyboard Shortcuts)	Icon
Select and set printer	“File” > “Printer Setup(Q)”	[Ctrl] + [Q]	
End ELCSoft	“File” > “Exit(X)”	[Alt] + [X]	--

Menu bar and General Toolbar			
Edit Menu Functions	Operating Procedure	Operation Keys (Keyboard Shortcuts)	Icon
Undo an action	“Edit” > “Undo(U)”	[Ctrl] + [Z]	
Redo an action	“Edit” > “Redo(R)”	[Ctrl] + [Alt] + [Z]	
Select the entire document	“Edit” > “Select All(A)”	[Ctrl] + [A]	--
Delete the selected content	“Edit” > “Delete”	[Delete]	
Cut a block	“Edit” > “Cut(T)”	[Ctrl] + [X]	
Copy a block	“Edit” > “Copy(C)”	[Ctrl] + [C]	
Paste a block	“Edit” > “Paste(P)”	[Ctrl] + [V]	
Insert block data into document	“Edit” > “Insert Block(O)”	[Ctrl] + [Insert]	--
Insert a blank row	“Edit” > “Insert Row(I)”	[Ctrl] + [I]	
Delete a row and shift the program up	“Edit” > “Delete Row(L)”	[Ctrl] + [Y]	
Delete the vertical line at the left side of the editing block	“Edit” > “Delete Vertical Line(D”	[Ctrl] + [D]	
Insert a blank cell to the right in SFC mode	“Edit” > “Insert Cell(B)”	[Ctrl] + [B]	
Delete a blank cell to the left in SFC mode	“Edit” > “Insert Cell(K)”	[Ctrl] + [K]	
Edit the program title	“Edit” > “Program Title(S)”	[Ctrl] + [Alt] + [T]	

Menu bar and General Toolbar			
Compiler Menu Functions	Operating Procedure	Operation Keys (Keyboard Shortcuts)	Icon
Convert ladder diagram to instruction	“Compiler” > “Ladder” =>”Instruction(I)”	[Ctrl] + [F9]	
Convert Instruction to ladder diagram	“Compiler” > “Instruction” =>”Ladder(L)”	[Ctrl] + [F10]	
Convert SFC diagram to instruction	“Compiler” > “SFC” => ”Instruction(C)”	[Ctrl] + [F11]	
Convert instruction to SFC diagram	“Compiler” > “Instruction” =>”SFC(S)”	[Ctrl] + [F12]	

Menu bar and General Toolbar			
Comments Menu Functions	Operating Procedure	Operation Keys (Keyboard Shortcuts)	Icon
Edit device comments	“Comments” > “Edit Device Comments(D)”	[Ctrl] + [Alt] + [D]	
Edit segment comments	“Comments” > “Edit Segment Comments(B)”	[Ctrl] + [Alt] + [B]	
Edit row comments	“Comments” > “Edit Row Comments(L)”	[Ctrl] + [Alt] + [L]	

Menu bar and General Toolbar			
Search Menu Functions	Operating Procedure	Operation Keys (Keyboard Shortcuts)	Icon
Go to designated Steps	“Search” > “Go To(J)”	[Ctrl] + [J]	
Find or replace the device and instruction	“Search” > “Search/Replace(F)”	[Ctrl] + [F]	
Return to Start of the program	“Search” > “Go to the Start(T)”	[Ctrl] + [Home]	--
Go to End of the program	“Search” > “Go to the End(N)”	[Ctrl] + [End]	--

Menu bar and General Toolbar			
View Menu Functions	Operating Procedure	Operation Keys (Keyboard Shortcuts)	Icon

Menu bar and General Toolbar			
View Menu Functions	Operating Procedure	Operation Keys (Keyboard Shortcuts)	Icon
Display Toolbar and Status bar	“View” > “Toolbars(T)”	--	--
Display or hide project work area	“View” > “Workspace(W)”	--	--
Compiler message check	“View” > “Output Window(M)”	--	--
Select monitoring data display mode	“View” > “Monitoring Data Format(N)”	--	--
Zoom in and Zoom out	“View” > “Zoom(Z)”	--	--
Switch to instruction mode	“View” > “Instruction List(I)”	--	
Switch to ladder diagram mode	“View” > “Ladder Diagram(L)”	--	
Switch to SFC mode	“View” > “SFC Diagram(S)”	--	
Display all device comments	“View” > “Edit Device Comments(D)”	--	
Display the list of used comments	“View” > “List of Used Comments(U)”	[Ctrl] + [Alt] + [U]	
Check the repeated use of output coil	“View” > “Cross Reference List(F)”	[Ctrl] + [Alt] + [K]	
Show or Hide the comments	“View” > “Show Comments(M)”	--	
Show or Hide the comments	“View” > “Symbol Table(B)”	--	

Menu bar and General Toolbar			
Communication Menu Functions	Operating Procedure	Operation Keys (Keyboard Shortcuts)	Icon
PC communicates with ELC or HHP and read/write program	“Communication” > “Transfer Setup(C)”	[Ctrl] + [F1]	
Verify if current ELC program is the same as editing program	“Communication” > “Verify with ELC(V)”	--	
Set or remove ELC password	“Communication” > “Password Setting(P)”	[Ctrl] + [F5]	
Execute ELC	“Communication” > “Run(R)”	[Ctrl] + [F8]	

Menu bar and General Toolbar			
Communication Menu Functions	Operating Procedure	Operation Keys (Keyboard Shortcuts)	Icon
Stop executing ELC	“Communication” > “Stop(S)”	[Ctrl] + [F7]	
Switch to ladder diagram monitor mode	“Communication” > “Ladder Start Monitoring(L)”	[Shift] + [Ctrl] + [F1]	
Switch to SFC monitor mode	“Communication” > “SFC Start Monitoring”	[Shift] + [Ctrl] + [F2]	
Monitor the designated device	“Communication” > “Devices Batch Monitoring(D)”	[Shift] + [Ctrl] + [F3]	
Force device to be On or Off	“Communication” > “Set Device On/Off(O)”	--	--
Change the current value of the designated device	“Communication” > “Enter Value(E)”	[Shift] + [Ctrl] + [F7]	--
Edit register (T, C and D)	“Communication” > “Edit Register Memory (T, C, D) (B)”	[Ctrl] + [R]	--
Edit device status	“Communication” > “Edit Bit Memory (M, S)”	--	--
Clear all ELC memory and set ELC to factory settings	“Communication” > “Format ELC Memory(M)”	[Shift] + [Ctrl] + [F5]	
Read / Write the data of the file registers of series ELC	“Communication” > “Edit File Register Memory(A)”	--	--

Menu bar and General Toolbar			
Communication Menu Functions	Operating Procedure	Operation Keys (Keyboard Shortcuts)	Icon
Update program while PC/PA/PH series ELC is running (On-line Programming)	“Communication” > “Send Changes(N)”	--	--
Auto detect ELC communication baud rate when connect ELC to PC	“Communication” > “Baud Rate Auto-Detect(Q)”	--	
Display current ELC information	“Communication” > “ELC Information(I)”	[Ctrl] + [Alt] + [I]	

Menu bar and General Toolbar

Options Menu Functions	Operating Procedure	Operation Keys (Keyboard Shortcuts)	Icon
Set PC COM port (COM1~COM8) to communication with ELC	“Options” > “Select COM Port(P)”		
Set ELC type and program capacity	“Options” > “Change ELC Type(U)”	[Shift] + [Ctrl] + [F6]	
Set the value of ELC communication address (D1121)	“Options” > “Station Address(A)”	[Shift] + [Ctrl] + [F8]	
Save file automatically before compiling	“Options” > “Autosave Setup(S)”	--	
Set the font setting and format of ladder diagram and comments	“Options” > “Font Setting and Comment Format”	--	
Set the auto query times and query interval time when transmission error occurs	“Options” > “Response Setup(R)”	--	
Set the communication baud rate of PC/PA/PH series ELC	“Options” > “Set Baud Rate(B)”	--	
Set the date and time of PC/PA/PH series ELC	“Options” > “Set ELC Date and Time(T)”	--	
Specify to enter device comments after inputting instruction	“Options” > “Prompt to Edit Device Comment(H)”	--	

Menu bar and General Toolbar			
Window Menu Functions	Operating Procedure	Operation Keys (Keyboard Shortcuts)	Icon
Arrange windows in an overlapping way	“Window” > “Cascade(C)”	--	
Arrange the file in a horizontal way	“Window” > “Title Horizontally(H)”	--	
Arrange files in a vertical way	“Window” > “Title Vertically(V)”	--	

Menu bar and General Toolbar			
Help Menu Functions	Operating Procedure	Operation Keys (Keyboard Shortcuts)	Icon
Display ELCSoft relevant information, including Delta website, ELCSoft program version, serial number and copyright	“Help” > “About ELCSoft(A)”	--	
RS-485 protocol setting, LRC/CRC generator, Duplicate ELC Service, and image saving	“Help” > “Intelligent Function Utility(C)”	--	
Help for ELCSoft	“Help” > “ELC Instruction & Special Registers Reference(S)“		
User Manual for ELCSoft	“Help” > “ELCSoft User Manual(I)”		

Company Information

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