KEYENCE

A84-034

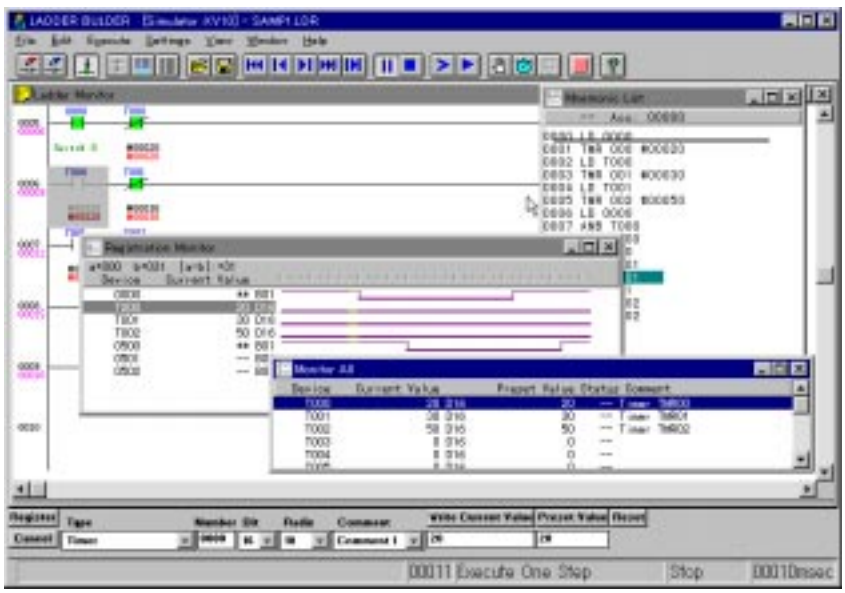
A Quick Guide to Ladder Builder for KV

KV Series Ladder Support Software

KV-SH6W

Trial version

Compatible with Windows 3.1/95



Introduction

Thank you for your interest in the KV Series Ladder Support Software LADDER BUILDER for KV (trial version).
The LADDER BUILDER for KV is software for creating debugging ladder programs, featuring user-friendly operation and advanced programming capabilities.
Please read this guide before using the software. We are delighted that you wish to understand the excellent functions of the LADDER BUILDER for KV, and are considering introducing the KV Series into your system.

⚠ CAUTION

1. This product is a demonstration version. Although the same functions are available in the commercial (resale) version, the following restrictions affect the installation of the software, the number of times it can be run, and the maximum length of time for a single run session.
   - You can install this software on the same PC only once. If you attempt a second installation, the operation will be disabled.
   - Once the software is installed, it can be started up to 50 times.
   - The operation time of a single session is no more than 2 hours.
2. If the operation reaches the 2 hour limitation, an alarm appears in a message window.
3. No part of this guide may be reprinted or reproduced without the prior written permission of KEYENCE.
4. The content of the Quick Guide is subject to change without notice.
5. KEYENCE has thoroughly checked and reviewed this guide. Please contact a sales office listed at the end of this guide if you have any questions or comments regarding this guide, or if you find any error.
6. KEYENCE takes no responsibility for any operational results at the user's site regardless of item 4 above.

Caution when using the software

You shall agree to the following terms and conditions before using the KV Series Ladder Support Software LADDER BUILDER for KV (trial version) (hereinafter referred to as "the product") created by KEYENCE.

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2. KEYENCE takes no responsibility to any affects resulting from the use of the product at the user's site.

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- IBM is a registered trademark of International Business Machines Corporation.
- 486DX2 and Pentium are registered trademarks of Intel Corporation.
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1. Before using the LADDER BUILDER for KV

1.1 Operating environment

The LADDER BUILDER for KV runs in the following operating environment:

PC

Models that will run MS-Windows 3.1/Windows 95.
IBM PC and PC/AT compatible models

- RS-232C port should be incorporated.
- 486DX2 or better (Pentium 90 MHz or better is recommended).
- 8 MB or more of extended memory (16 MB or more is recommended.)
- 4.5 MB or more of free hard disk space

OS

MS-Windows 3.1
Windows 95

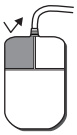
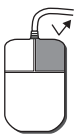
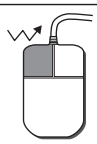
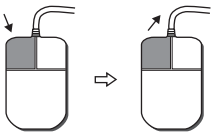
Display

Resolution of 640 x 480 dpi or higher

Note: Long file names are not supported even with Windows95.

1.2 Basic mouse operation

The mouse has a right and a left button. Operate the mouse using these two buttons. The following table summarizes the terminology and operation of the mouse.

	Terminology	Operation	Description
	Mouse cursor	The mouse cursor moves in response to the movement of the mouse.	Select or execute an item by pointing at it with the cursor and clicking a button.
	Left-click	Click and release the left mouse button.	This means "OK" or "YES". Use this operation when selecting the desired item from a list.
	Right-click	Click and release the right mouse button.	Use this operation when selecting "NO" or canceling a process.
	Double-click	Click the left mouse button twice quickly.	Use this operation when selecting or setting an item.
	Drag	Move the mouse while holding down the left mouse button.	Use this operation for the Drag & Drop function, line selection and editing connection lines.

1.3 Installing the LADDER BUILDER for KV

Install the LADDER BUILDER for KV according to the instructions below.
The installation procedures varie depending on the Windows version. Choose the proper one according to your operating system.

- Installation on Windows 95 ⇨ *Page 3*
- Installation on Windows 3.1 ⇨ *Page 6*

Installation on Windows 95

Install the software to Windows 95, using the following drive configuration as an example.

Drive C: Hard disk drive
Drive A: Floppy disk drive

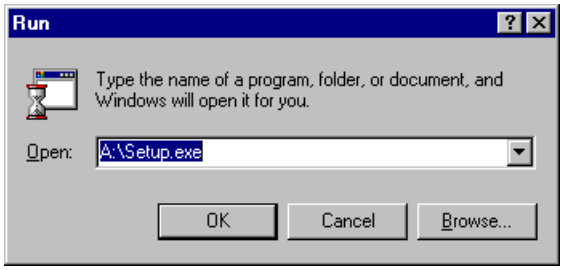
First, start up Windows 95 and have the provided installer disks (two) close at hand.

Note: Before installing the LADDER BUILDER for KV, terminate any other software programs run Sning on Windows 95.

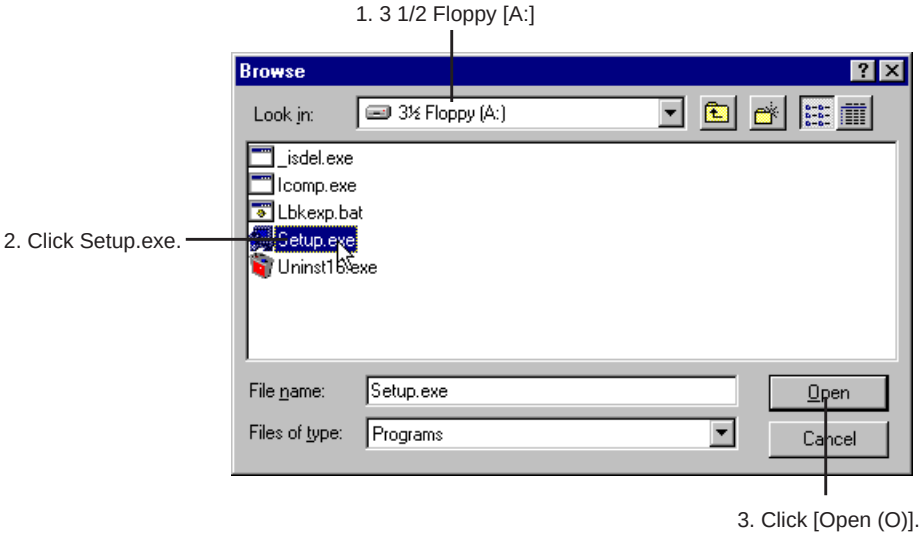
1. Place "LADDER BUILDER for KV installer disk #1" in the floppy disk drive.

2. Click [Run...] from the start menu.

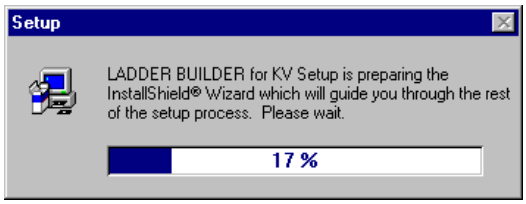
3. Enter [a: \setup] in [Open (O):] and click [OK]. You can also click [Browse (B)] to select the file from the [Browse] dialog box.



To select the file from the [Browse] dialog box:

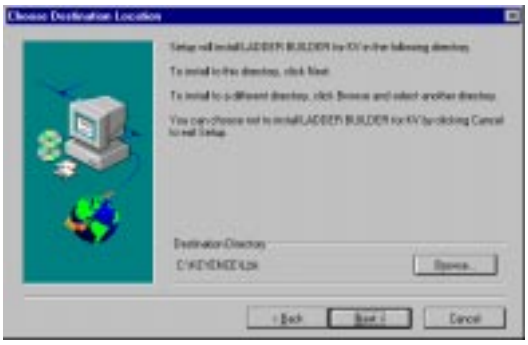


4. A bar graph appears and the system starts preparing for installation.

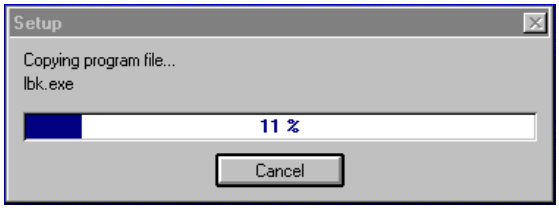


5. When the screen below appears, click [Next (N)>]. To cancel installation, click [Cancel].

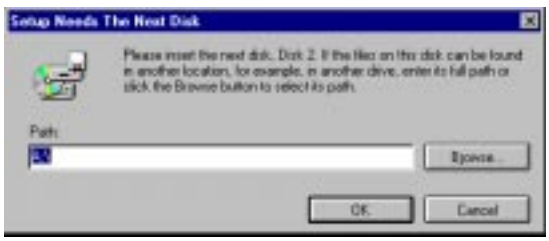
6. Confirm the drive name and folder name (directory) to which the software is installed.
   Initially, the system prompts you to install the software in C:\keyence\lbk. If you prefer to install the software here, click [Next (N) >] . To change the destination, click [Browse (B)...] and specify the drive name and folder name (directory).



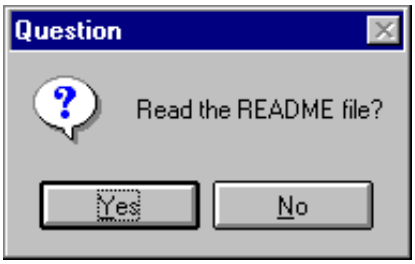
7. A bar graph appears showing how much of the file has been copied.



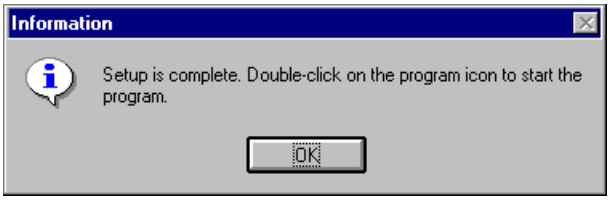
8. When the prompt "Insert the next disk" appears, eject the inserted disk, insert "LADDER BUILDER for KV master disk #2" (the second installer disk) and click [OK].



9. The README file contains the latest information which is not covered in this guide. Be sure to click [Yes (Y)] and read the information.



10. Installation is completed. Click [OK].



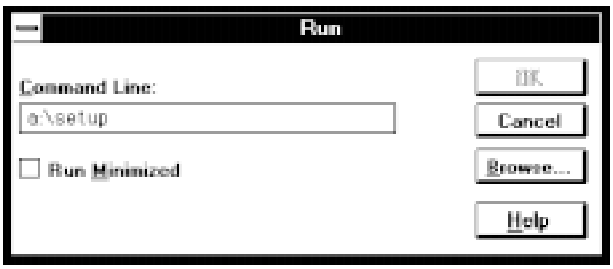
Installation on Windows 3.1

Install the software to Windows 3.1, using the following drive configuration as an example.

Drive C: Hard disk drive
Drive A: Floppy disk drive

First, start up Windows 3.1 and have the provided installer disks (two) close at hand.

1. Set "LADDER BUILDER for KV installer disk #1" in the floppy disk drive.
2. From the program manager menu, select [File (F)] → [Run...].
3. Enter [a: \setup] in [Command line] and click [OK]. You can also click [Browse (B)] to select the file from the [File Reference] dialog box.



The subsequent procedure steps are the same as steps 4 to 10 in "Installation on Windows 95" (☞ *page 2 to 3*).

1.4 Starting and terminating the software

Start the software

Windows 95

From the start menu, select [Program (P)] → [KEYENCE Applications] → [LADDER BUILDER for KV].

Windows 3.1

Double-click the icon [LADDER BUILDER for KV] in the program manager [KEYENCE Applications] group.

Terminate the software

You can terminate the software with any one of the following methods:

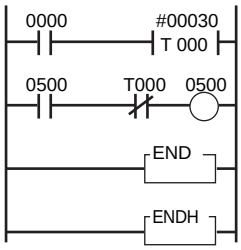
- Select [File (F)] → [Exit (X)] from the menu.
- Press the [Alt] key and [F4] key at the same time.
- For Windows 95, click the "Close" button at the right edge of the title bar.
- For Windows 3.1, double-click the "Control menu box" at the left edge of the title bar.

2. Starting LADDER BUILDER for KV

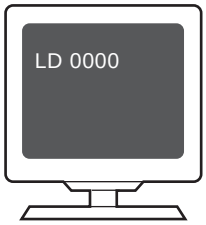
2.1 Editing

Let's create a ladder diagram.

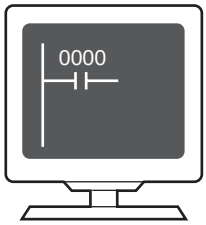
1. To introduce a variety of entry methods provided by the LADDER BUILDER for KV (L.B.K.), let's create a one-shot circuit and study how to edit the ladder diagram.

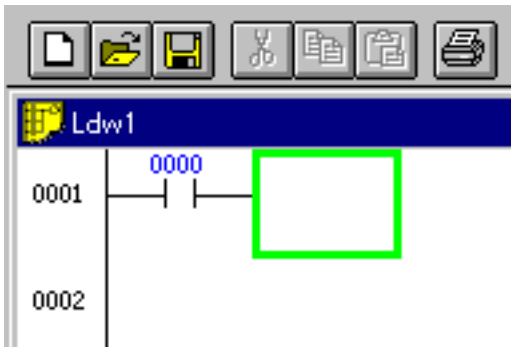


2. First, enter "relay 0000 ". Key-in "LD_0000" and [Enter] from the keyboard.
   * "_" means the space bar.

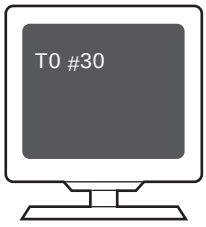


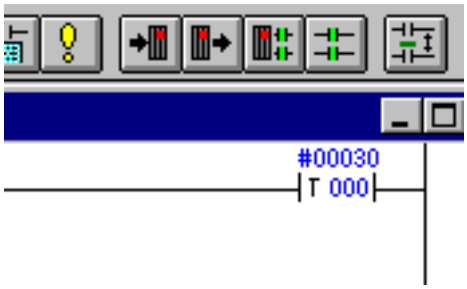
3. The symbol for "relay 0000 " is created on the screen. In this way, you can edit the diagram using mnemonic codes.



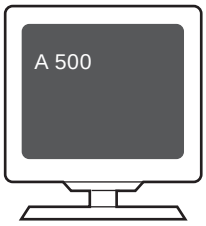


4. Draw a line by pressing [Ctrl] + [Tab]. Enter the timer "T0_#30" and [Enter]. The following then appears on the screen.

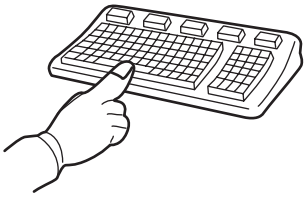


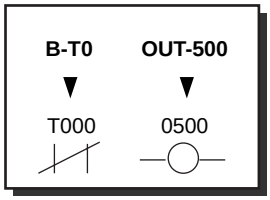


5. To make key entry much easier, you can use a short-cut key like "A" for "LD" (contact A) and "B" for "LDB" (contact B).
   In this example, enter "A_500" and [Enter].

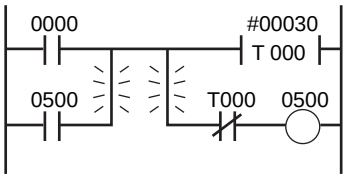


6. In the same way, press the space bar to enter one blank and enter "B_T0" and [Enter], and "OUT_500" and [Enter] sequentially.

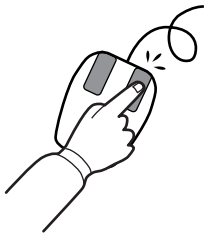


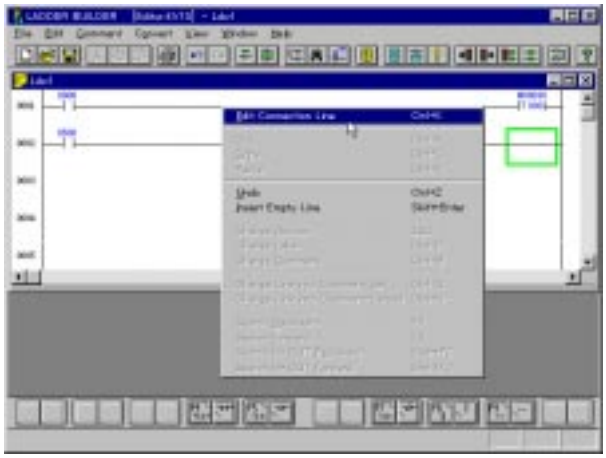


7. The next step is to draw vertical lines.



8. Right-click the mouse to display the window.
   Left-click "Edit connection lines" in the window.





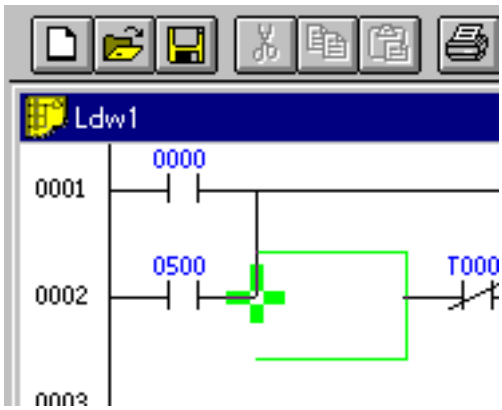
9. The symbol entry cursor changes to the connection line editing cursor.

Symbol entry cursor

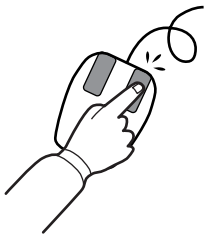
Connection line editing cursor

10. Drag the cursor to the position where you want to draw a line to edit the connection lines.

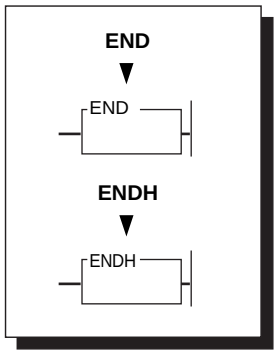
* If you make a mistake, repeat the same operation by holding down [Shift] to erase the wrong entry.



11. To return the cursor to the symbol entry cursor, right-click the mouse again to display the window and left-click "Edit connection lines".

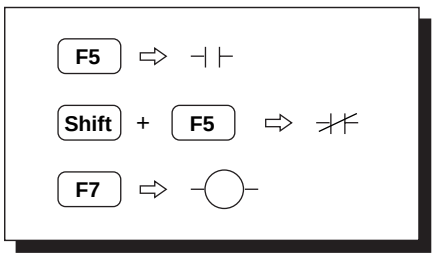


12. Finally, enter "END" and [Enter], and "ENDH" and [Enter] to complete programming.
How do you like it? You can edit the diagram just like in a word processor, without switching modes.



13. The LADDER BUILDER for KV provides many other entry methods and functions. Here's shown some typical entry methods.
Let's try various ways, and find the best one for you.

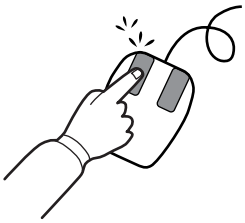
14. You can use the FUNCTION keys to enter the instruction words.

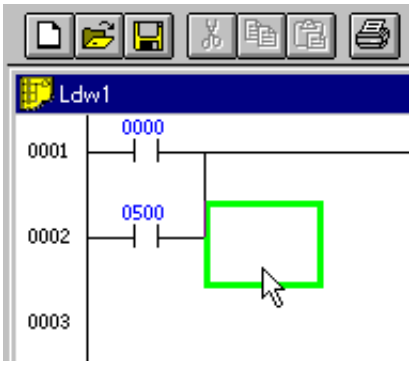


15. You can also click the "Function menu" icon on the editing screen to enter the instruction words.

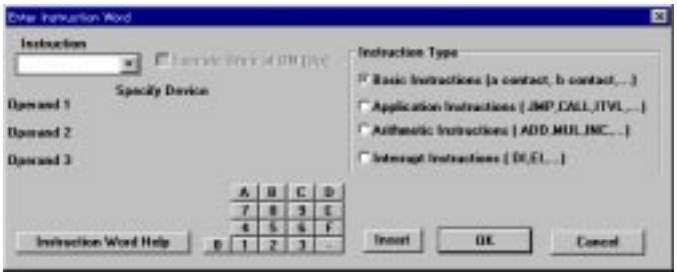
16. To enter a complex instruction word which you do not know how to enter...

17. Double-click the place where you want to enter the instruction word.





18. The instruction word selection window appears which helps you enter the instruction word easily.



19. Running under Windows, the LADDER BUILDER for KV allows you to open two or more files at the same time. You can copy the ladder data between the files in the following manner:

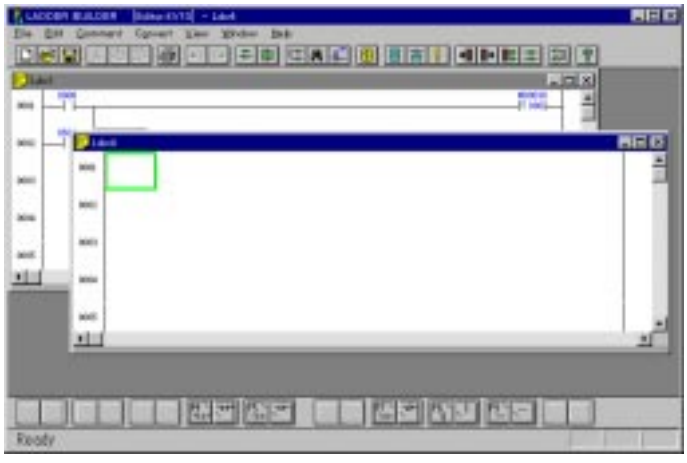
    Drag the line and select it (reverse in yellow).

    ▼

    Click " (copy)" icon.

    ▼

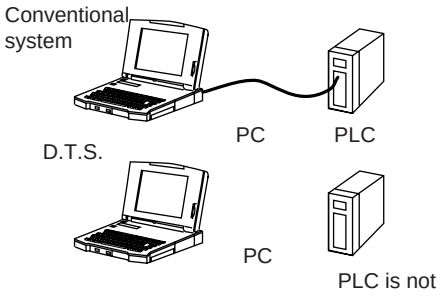
    Click the copy destination and click " (paste)" icon.



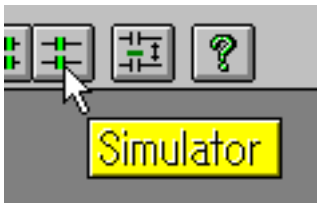
2.2 D.T.S. (Desk Top Simulation)

Let’s try a simulation.

1. The LADDER BUILDER for KV has a great advantage which enables easy debugging.
   To demonstrate this, let’s try the D.T.S. (desk top simulation).
   The D.T.S. eliminates the connection between the PC and the PLC, which is required by the conventional system. You can check the ladder operation easily from the PC.



2. Enter the D.T.S. by clicking the "  (simulator)" icon shown below.



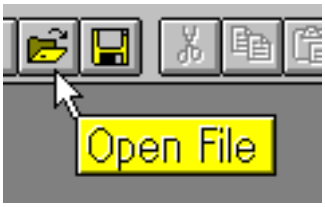
3. The trial version provides the sample programs listed below.
   The sample program is stored in "\LBK\SAMPLE".
   If you want to try the D.T.S. as soon as possible, use this sample file.

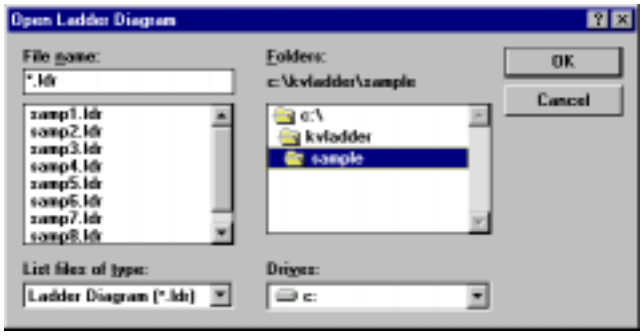
* SAMP01.LDR and SMP02.LDR are the programs for the simulator.

> SAMP01.LDR: Turn ON lamps sequentially.
> SAMP02.LDR: Blink lamps automatically.
> SAMP03.LDR: Control the KV300 CPU positioning.
> SAMP04.LDR: High-speed counter
> SAMP05.LDR: Communications between the L2s
> The D.T.S. contains 14 sample programs in all, including the above programs.

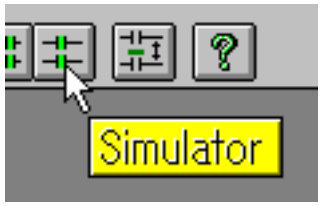
4. In this example, "SAMP01.LDR: Turn ON lamps sequentially" is used to explain how to operate the D.T.S.

5. First, open the file.
   Select "Open file" from the edit screen and select the file to be read.
   [The sample program is contained in the directory \Keyence\LBK\Sample.]
   The ladder program "Turn lamps ON sequentially" is in the file "SAMP01.LDR".





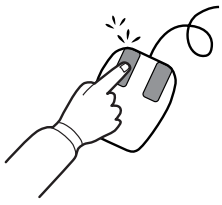
6. When you select the file, the ladder program is automatically read into the system.
   Click " (simulator)" icon to enter the simulation screen.

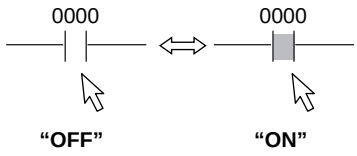


7. Left-click the icon " (continuous scanning)" at the top of the screen to execute the program.
   The indication "Running" appears at the lower right on the screen and the system enters the virtual execution mode.

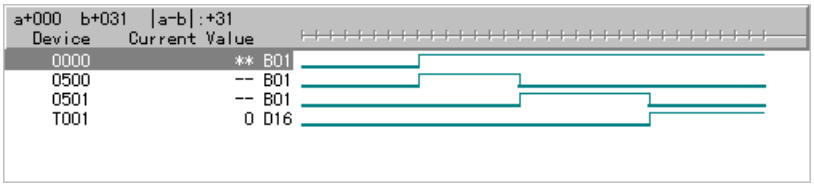
8. Has the program been executed? How does the system turn ON/OFF the relay? Is a switch box required?

9. No. You do not have to prepare external devices such as a switch box.
   To turn ON/OFF the relay, you can simply place the mouse cursor at the relay on the screen and double-click it.
   Let's double-click " 0000 " in line 0.
   What does the program look like? The program should turn ON the relay.

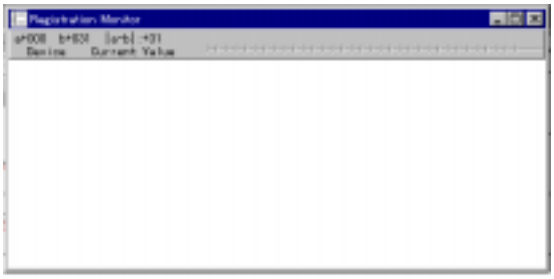




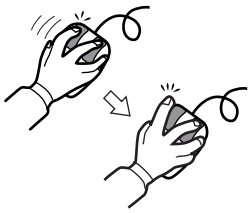
10 After checking the program operation, double-click
   " 0000 " to turn it OFF.
   Next, I will tell you how to operate the "Registration monitor" which allows you to view the time chart in the real-time mode.



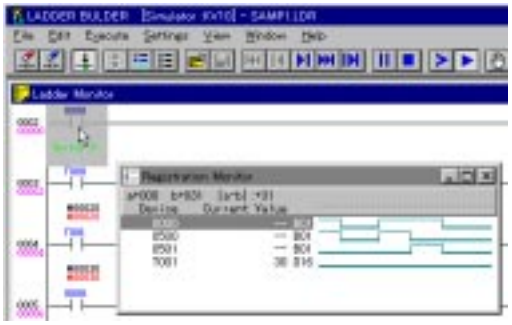
11. Click "  (registration monitor)".
The window shown below opens.



12. Place the mouse cursor on the relay to be monitored in the time chart. Drag the relay to the registration monitor and release the mouse button to drop it.
This is the LADDER BUILDER's "Drag & Drop" function to register the relay.
In this example, register 0000 → 0500 → 0501 → T0.



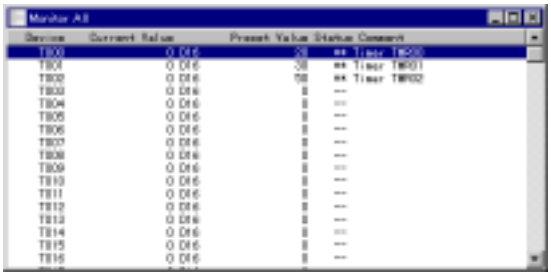
13. After registration is completed, double-click the relay "0000 ⊣⊢ " in the ladder diagram to turn ON the relay. Look at the time chart. It must operate in response to the ladder action.



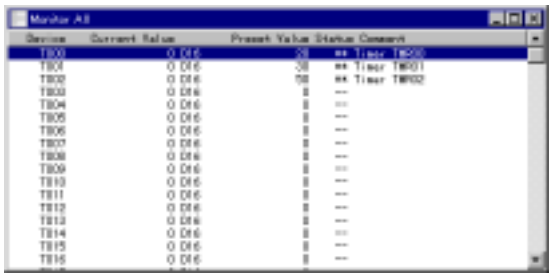
14. You can also turn ON/OFF the relay by double-clicking it on the registration monitor.

* Double-click the relay "0000 ⊣⊢ " on the registration monitor for checking.

15. After checking the operation, place the cursor at "T0" in the ladder diagram.
Finally, I will show you the "Global monitor", which lists all the devices at one time.

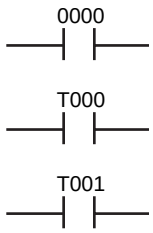


16. Click "  (Monitor All)" as shown to the left to access "Monitor All".

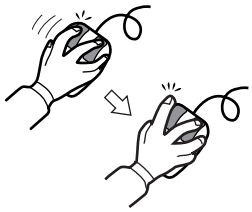


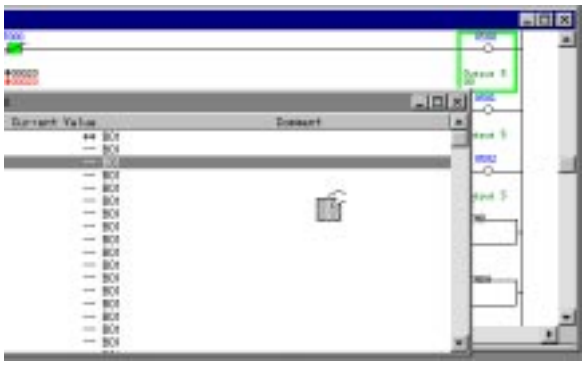
17. Unlike "Registration monitor", "Monitor All" automatically registers all the devices at the cursor position when opening the window. Thus, you do not have to register the devices as you do in the "Registration monitor".
Currently, the devices are listed in order, starting with the number specified by "T0".

18. Like "Registration Monitor", "Monitor All" allows ON/OFF of relays. Thus, this mode is effective when you attempt to simulate a ladder program which turnON/OFF multiple relays.



19. In the "Monitor All" program, you can register the device using the Drag & Drop function.
* Register "0500" using Drag & Drop.
The data is listed sequentially starting with "0500".





20. Because the LADDER BUILDER for KV is a Windows based software, "Registration monitor" and "Monitor All" can be opened any time.

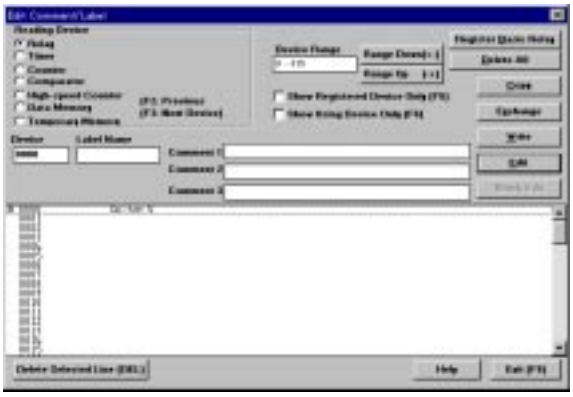
2.3 Very useful!! Functions

1. Have you had deleted a circuit by mistake?

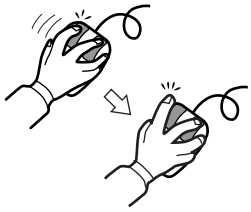
2. Do not worry about it.
   You can select "Edit (E)" → "Undo the process (U)" and the lost data appears again. This operation returns the program to the previous step.
   This is called the "UNDO function".

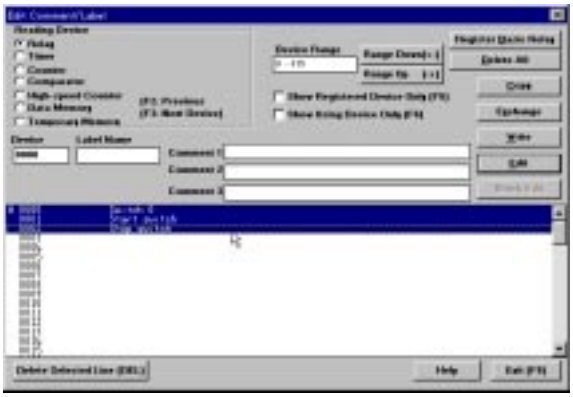
3. To globally move or copy labels or relay comments in blocks, you can use the [Comment Block Copy function].

4. Click "  Edit comment/label" to open the "Edit comment/label" window as shown below.

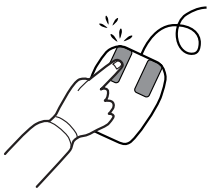


5. Drag the range to be copied.

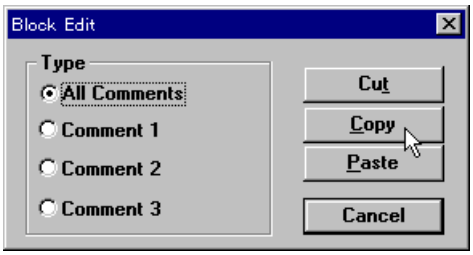




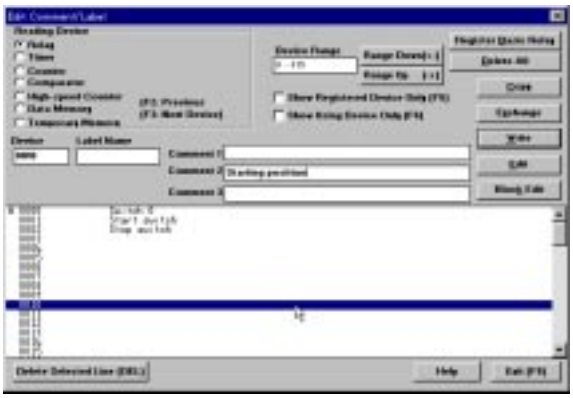
6. Click the "Block edit" button.



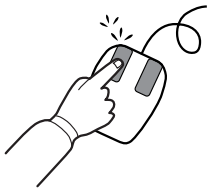
7. The "Block edit" window as shown below opens.
   Select "Type" and click "Copy".



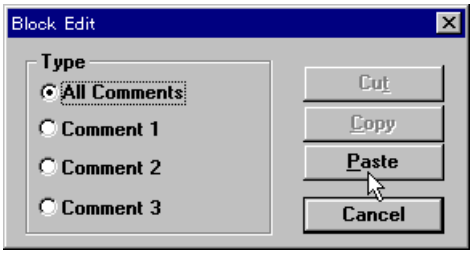
8. The "Edit comment/label" window opens again. Click the device to copy to (copy destination).



9. Click the "Block edit" button.



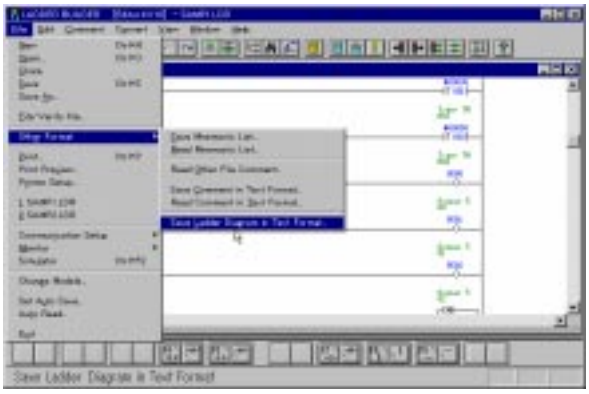
10. Click "Paste".



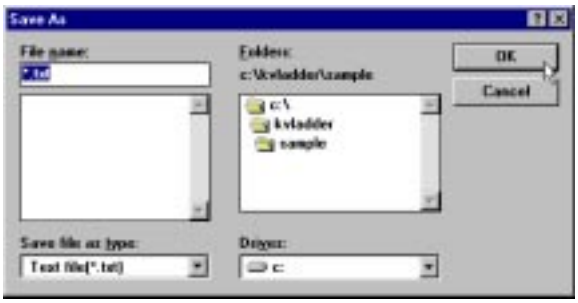
11. Labels and relay comments have been easily copied in blocks.

12. The useful "Text save" function is available for you. Thus, you do not have to cut and paste the ladder diagrams when creating specifications.

13. Open the ladder diagram which you want to copy in the specification.
    Select the following menus: "File (F)" → "Other format (E)" → "Save ladder diagram in text format".



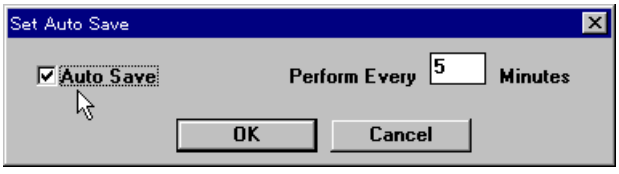
14. Specify the file name and click "OK". The ladder diagram is saved in the text format.



15. Then, you can simply start your PC, and cut and paste the text from the ladder diagram to the WORD PROCESSOR software. In the WP software, you can edit and arrange the diagram as desired.

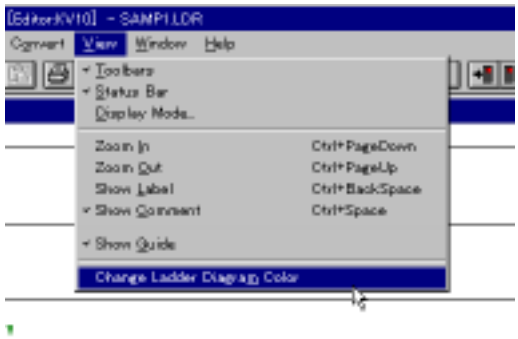
16. Have you ever lost the data when your PC suddenly hung up or turned OFF due to power failure during the creation of a ladder diagram?

17. The LADDER BUILDER for KV provides a function which secures the data in such emergencies.
    Select "File (F)""Auto Save Setting (U)" and the system will automatically copy the ladder data in a backup file at a specified time interval.

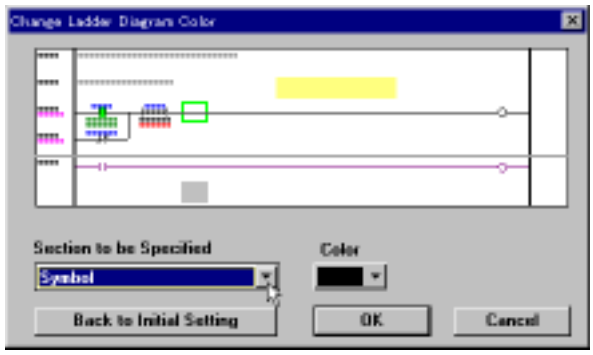


18. If your PC crashes, the LADDER BUILDER for KV automatically reads the ladder data from the backup file to recover the program next time you start the system.

19. If you have difficulties in viewing the display (this may occur depending on the display type) or you desire a different ladder diagram color, the "Display Color Change" function will help you a lot.
    Select "Display (V)" → "Change Ladder Diagram Color (M)" from the menu.



20. Then, the "Change Ladder Diagram Color" window opens as shown below.
    You can click any object screen part to specify any color for the parts.
    How about trying the available functions and customizing the LADDER BUILDER for KV to fit your purpose?



Specifications are subject to change without notice.

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