HCFA

HCP-Works PROGRAMMING MANUAL

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Manual Version : 1.02

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Terminology

PLC	Programmable logic controller or programmable controller
HCA1	HCFA HCA1 series PLC
HCA2	HCFA HCA2 series PLC
HCA8	HCFA HCA8 series PLC
HCP - Works	Programming software for HCFA HCA1, HCA2, HCA8 series PLC

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Chapter 1 HCP-Works Overview

This section has a brief description of the programming software HCP–Works.

1.1 Functions of HCP - Works

HCP – Works is the programming software used for HCFA programmable controller (PLC) settings, programming, debugging and maintenance.

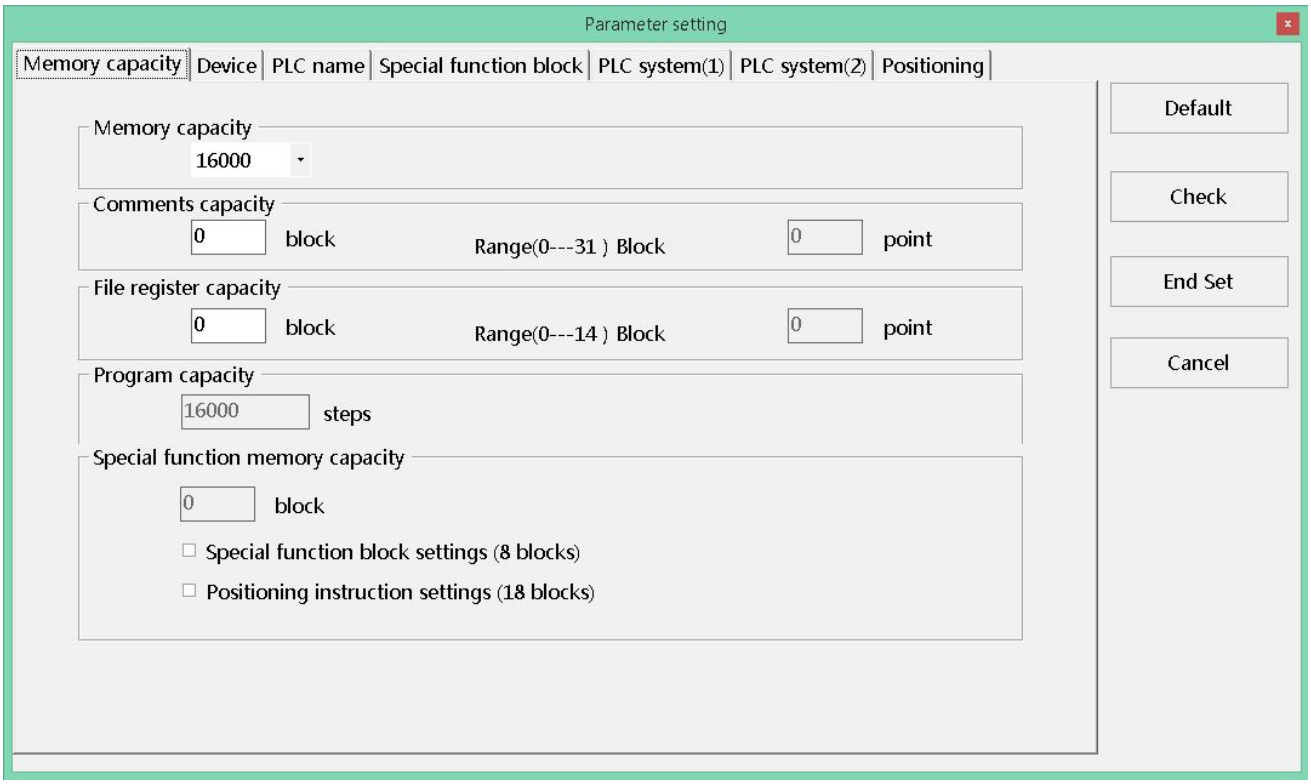
The functions of HCP–Works are as follows.

Creating projects

The functions are available for editing in the ladder language.

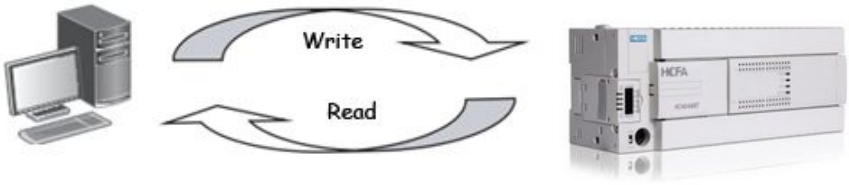
Parameter setting

Setting the parameter and I/O of CPU module and parameter of special module can be done.



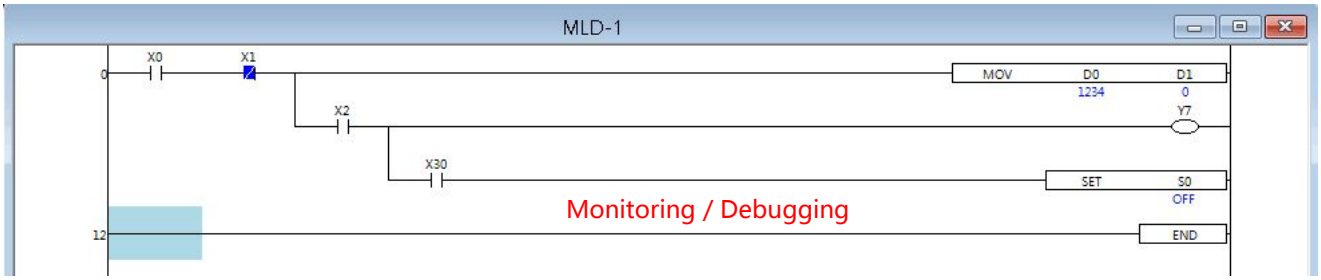
Write to/Read from programmable controller CPU

By the functions of "Write to PLC" /" Read from PLC", created sequence programs can be written to or read from programmable controller CPU.
In addition, sequence program, when programmable controller CPU is during RUN, can be changed by Write during RUN.



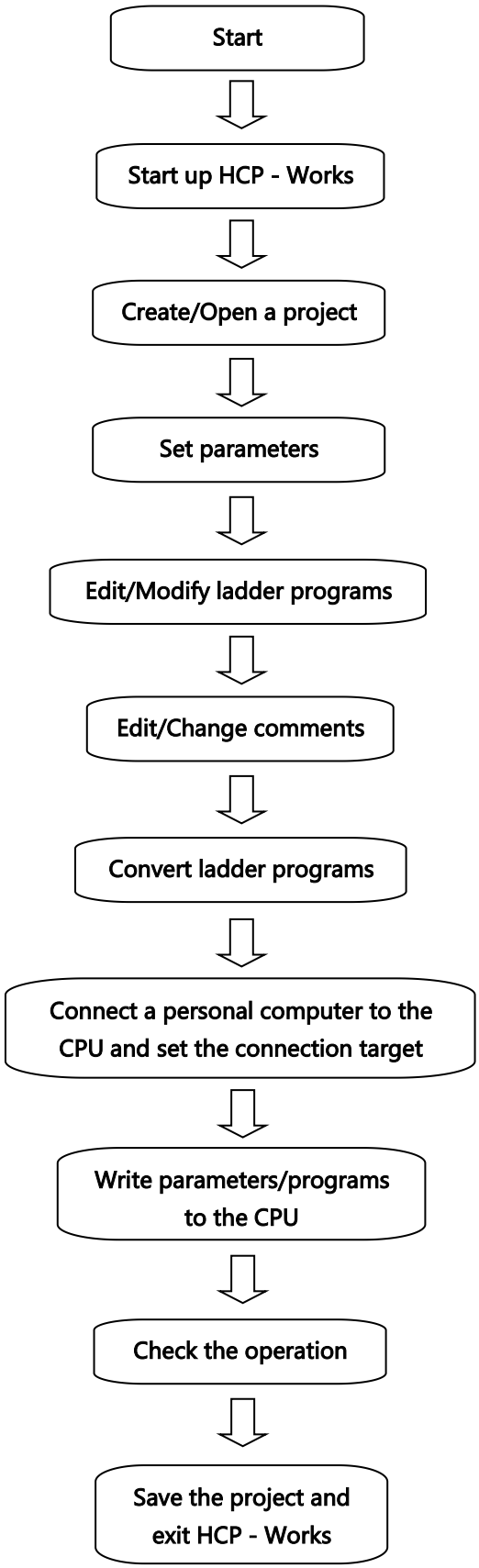
Monitoring/Debugging

The created sequence program can be written to programmable controller CPU, and the current device values can be monitored online.



1.2 Programming Procedures of HCP- Works

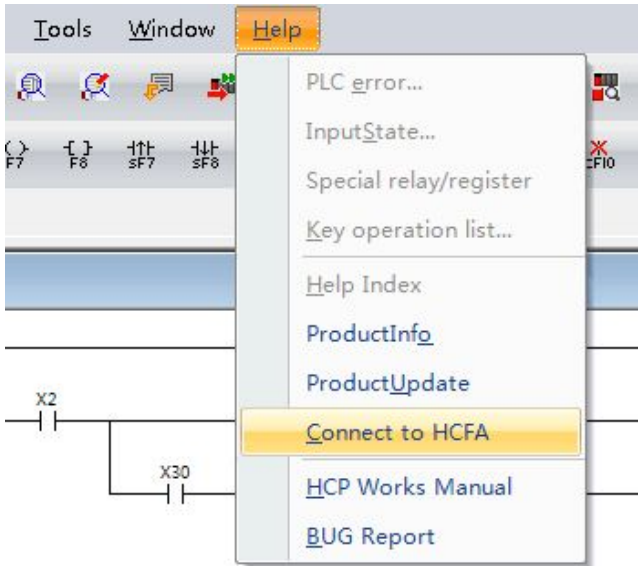
The section explains the general operating steps from the creation of a program to the execution of the created program in the programmable controller CPU.



1.3 Connecting to HCFA Website

Operating steps

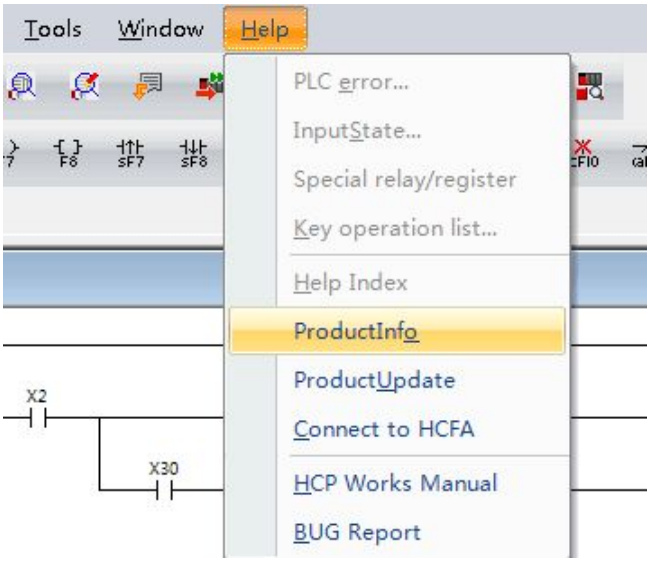
Select [Help] ⇨ [Connect to HCFA website]



1.4 Checking HCP- Works Version

Operating steps

Select [Help] ⇨ [Product information]



Chapter 2 Screen Configuration and Basic Operation

This chapter explains the screen configuration and basic operation of HCP – Works.

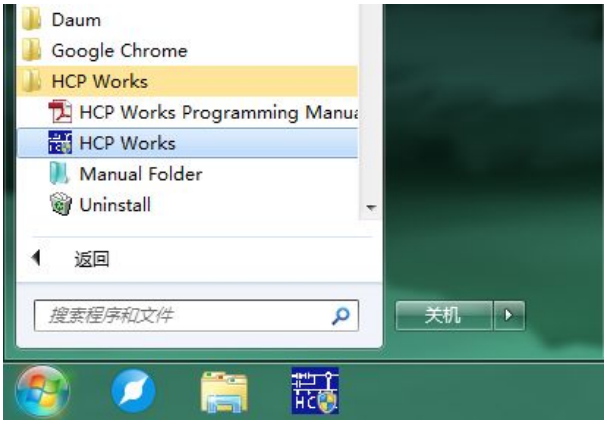
2.1 Starting and Exiting HCP-Works

This section explains the operation methods of starting/exiting HCP-Works.

Starting HCP-Works

Operating procedure

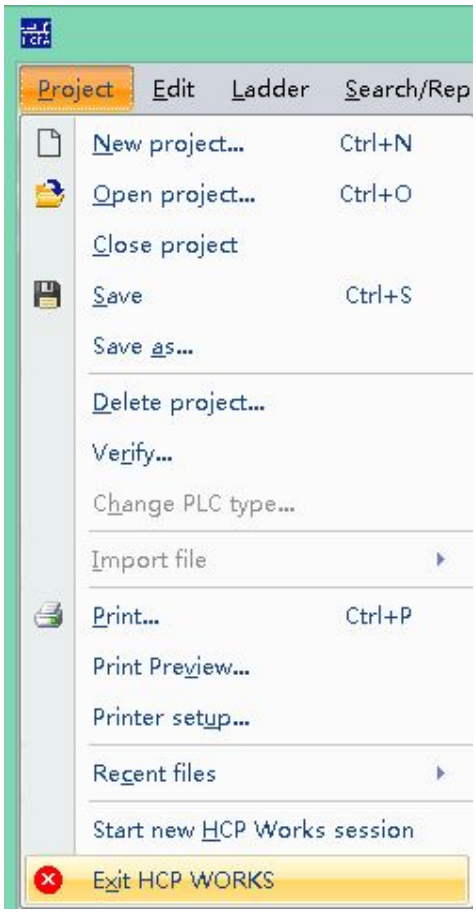
Start menu ⇨ [All programs] ⇨ [HCP - Works (En)] ⇨ [HCP Works]



Exiting HCP-Works

Operating procedure

Select [Project] ⇨ [Exit HCP Works]



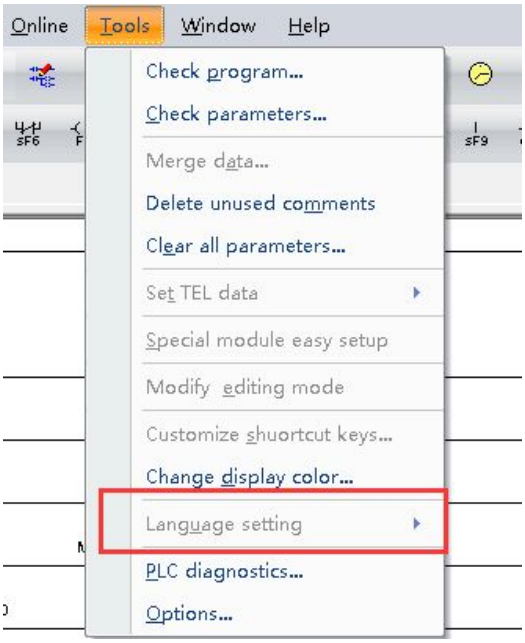
2.2 Switching Display Language

HCP - Works supports multi-language display.

Screen display

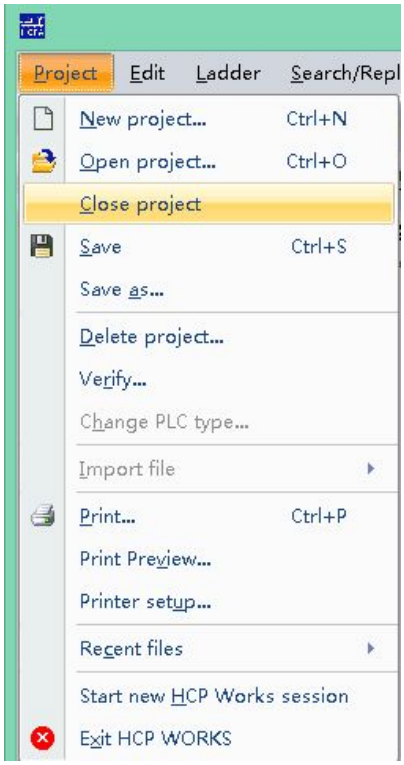
Operating procedure

Tools ⇨ [Language setting]



REMARK

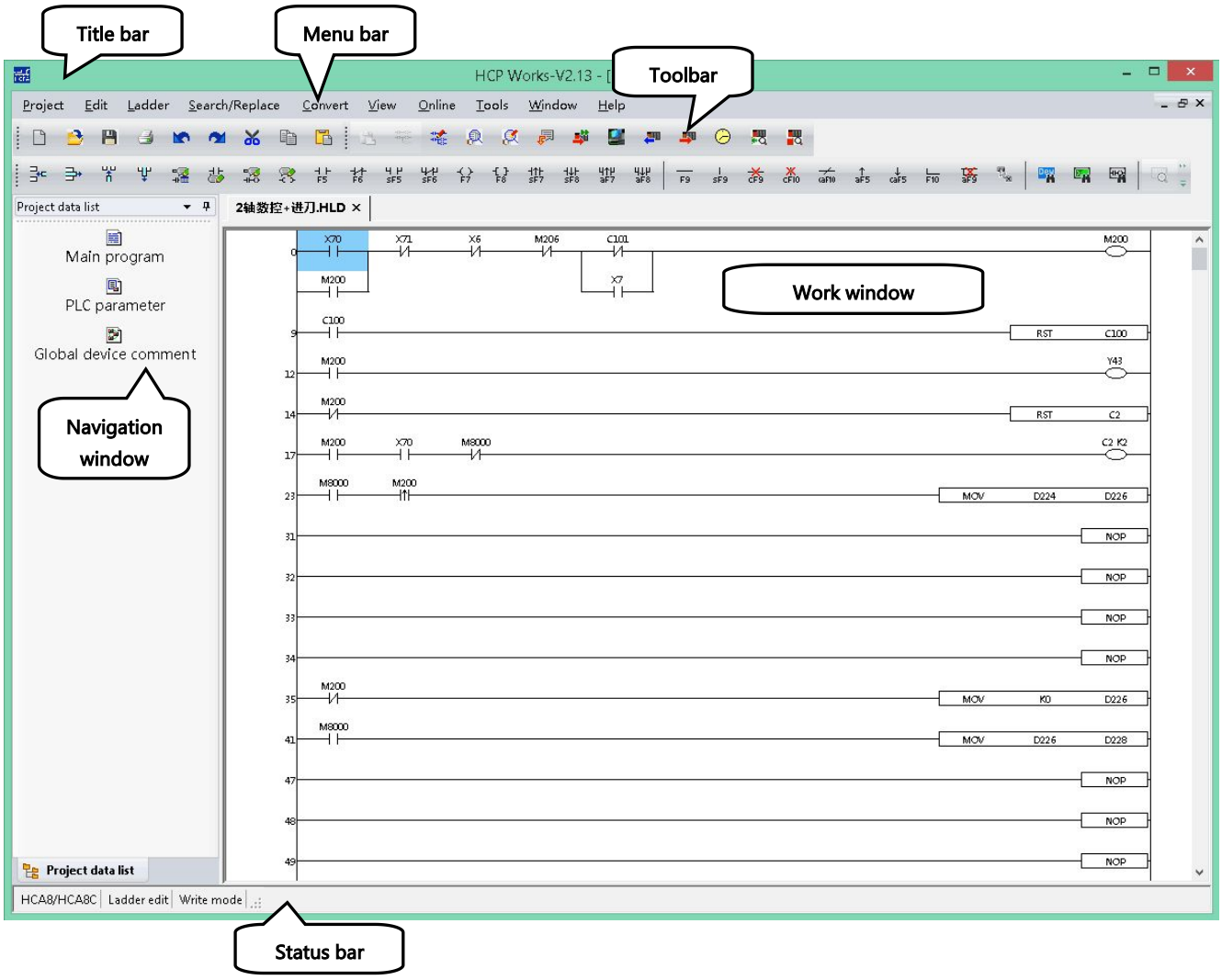
Before switching the display language, please close all the projects and pay attention to save the files.



2.3 Screen Configuration

This section explains the main frame (basic screen) of HCP - Works that is displayed when it is started up.

Project display



2.4 List of Functions

List of common functions

[Project]	
⇨ [New project]	Creates a new project.
⇨ [Open project]	Opens an existing project.
⇨ [Close project]	Closes an open project.
⇨ [Save]	Saves a project.
⇨ [Save as]	Names and saves a project.
⇨ [Delete project]	Deletes an existing project.
⇨ [Verify]	Verifies between two project data.
⇨ [Change PLC type]	Changes the programmable controller CPU type
⇨ [Import files]	
⇨ [Print]	Prints the open screen.
⇨ [Print setup]	Changes the printer settings.
⇨ [Print preview]	Displays the print preview of the open screen.
⇨ [Recent file]	
⇨ [Start new HCP-WORKS]	
⇨ [Exit HCP-WORKS]	Exits HCP-WORKS

[Edit]	
⇨ [Undo]	Restores the previous processing status.
⇨ [Redo]	Restores the processing deleted with [Undo].
⇨ [Cut]	Cuts the selected data.
⇨ [Copy]	Copies the selected data
⇨ [Paste]	Pastes the cut or copied data at the cursor position.
⇨ [Qpaste]	QPaste
⇨ [Delete]	Deletes the selected data.
⇨ [Select All]	Selects all items.
⇨ [Insert row]	Adds a row above the cursor position.
⇨ [Delete row]	Deletes a row at the cursor position.
⇨ [Insert col]	Adds a column above the cursor position.
⇨ [Delete col]	Deletes a column at the cursor position.
⇨ [Insert NOP batch]	Inserts an NOP in front of the ladder block at the cursor position
⇨ [Delete NOP batch]	Batch-deletes NOPs in the program being edited.
⇨ [Comment documentation]	Comment documentation

[Ladder]	
⇨ [Edit mode]	Edits the target.
⇨ [Open contact]	Inserts open contact at the cursor position.
⇨ [Close contact]	Inserts close contact at the cursor position.
⇨ [Open branch]	Inserts open branch at the cursor position.
⇨ [Close branch]	Inserts close branch at the cursor position.
⇨ [Coil]	Inserts coil at the cursor position.
⇨ [Application instruction]	Inserts application instruction at the cursor position.
⇨ [Rising pulse]	Inserts rising pulse at the cursor position.
⇨ [Falling pulse]	Inserts falling pulse at the cursor position.
⇨ [Rising pulse open branch]	Inserts rising pulse branch at the cursor position.
⇨ [Falling pulse open branch]	Inserts falling pulse branch at the cursor position.
⇨ [Horizontal line]	Inserts horizontal line at the cursor position.
⇨ [Vertical line]	Inserts vertical line at the cursor position.
⇨ [Delete horizontal line]	Delete horizontal line
⇨ [Delete vertical line]	Delete vertical line
⇨ [Invert operation results]	Invert operation results
⇨ [Convert operation results to rising pulse]	Convert operation results to rising pulse
⇨ [Convert operation results to falling pulse]	Convert operation results to falling pulse
⇨ [Draw line mode]	Draws line.
⇨ [Delete line mode]	Deletes line.
⇨ [Delete device mode]	Deletes device.

[Search / Replace]	
⇨ [Cross reference list]	Displays the usage of selected device or label.
⇨ [Instruction list]	Instruction list.
⇨ [List of used devices]	Displays the usage of devices.
⇨ [Find device]	Searches a device/label in the program.
⇨ [Find instruction]	Searches an instruction.
⇨ [Find contact or coil]	Searches a contact or coil corresponding to the specified device.
⇨ [Find step no]	Searches the step no..
⇨ [Find character string]	Searches a string.
⇨ [Replace device]	Replaces a device/label in the program.
⇨ [Replace instruction]	Replace an instruction.
⇨ [Replace character string]	Replace a character string.
⇨ [Change open/ close contact]	Changes an open contact to a closed contact, or closed contact to an open contact.
⇨ [Device block replacement]	Device batch replace, batch-replaces devices with the specified device.
⇨ [Change TC setting]	Batch-changes timer/counter setting values used in the program.
⇨ [Jump to next ladder block]	Moves the cursor from the current position to the start of the next ladder block.
⇨ [Jump to last ladder block]	Moves the cursor from the current position to the start of the previous ladder block.

[Convert / Compile]	
⇨ [Convert]	Convert
⇨ [Convert (Online change)]	Convert (Online change)

[View]	
⇨ [Toolbar]	Displays/hides the toolbar.
⇨ [Status bar]	Displays/hides the status bar.
⇨ [Color and Font]	Sets the display color such as labels, device comments on the work window.
⇨ [Comment]	Displays comment.
⇨ [Statement]	Displays statement.
⇨ [Note]	Displays notes.
⇨ [Comment lines]	Number of comment lines.
⇨ [Hide ladder block]	Hides a ladder block at the cursor position.
⇨ [Show ladder block]	Displays a hidden ladder block at the cursor position.
⇨ [Display device program]	Displays device program.
⇨ [Zoom]	Changes the display magnification of the ladder.
⇨ [String size]	Enlarges or reduces the text display size on the editing screen.
⇨ [Label information]	Label information.
⇨ [Application Instruction help]	Application Instruction help.
⇨ [Alias]	Alias

[Online]	
⇨ [Transfer setup]	Transfer setup.
⇨ [Read from PLC]	Reads data from the programmable controller CPU.
⇨ [Write to PLC]	Writes data to the programmable controller CPU.
⇨ [Remote operation]	Remotely controls RUN/PAUSE/STOP of the programmable controller CPU from HCP Works.
⇨ [Set clock]	Sets the clock in the programmable controller CPU.
⇨ [Logkeyword]	Keyword register.
⇨ [Keyword setup]	Keyword protection
⇨ [PLC memory]	PLC memory operation.
⇨ [Monitor]	Monitor
⇨ [Device batch write]	Device batch write

[Tools]	
⇨ [Check program]	Checks programs of the project without labels and displays errors.
⇨ [Check parameters]	Checks parameters and displays errors.
⇨ [Merge data]	Merge data.
⇨ [Delete unused comments]	Deletes unused comments.
⇨ [Clear all parameters]	Delete all parameters.
⇨ [Set TEL data]	Sets TEL data, links by modem.
⇨ [Special module easy setup]	Special module easy setup.
⇨ [Modify editing mode]	Modifies editing mode.
⇨ [Customize shortcut keys]	Changes the settings of the shortcut keys.
⇨ [Change display color]	Sets the display color.
⇨ [Language setting]	Sets the language.
⇨ [PLC diagnostics]	Diagnoses the operating status of the programmable controller CPU.
⇨ [Options]	Sets various options.

[Window]	
⇨ [Cascade]	Tiles windows in overlapping display.
⇨ [Tile vertically]	Tiles windows vertically
⇨ [Tile horizontally]	Tiles windows horizontally.
⇨ [Arrange icons]	Arranges the icons at the bottom of the window.
⇨ [Close all windows]	Closes all open windows.
⇨ [Windows list]	Displays a list of open windows.

[Help]	
⇨ [PLC error]	Displays the explanation for each CPU error code.
⇨ [Input state]	Inputs state.
⇨ [Special relay/register]	Displays the explanation for each special relay and special register.
⇨ [Key operation list]	Key operation list.
⇨ [Help index]	Helps index.
⇨ [Product information]	Displays the product information.
⇨ [Product update]	Updates the product.
⇨ [Connect to HCFA website]	Connects to HCFA website.
⇨ [HCP Works Manual]	HCP Works Manual.
⇨ [Debug Report]	Debug Report.

Chapter 3 Initialization

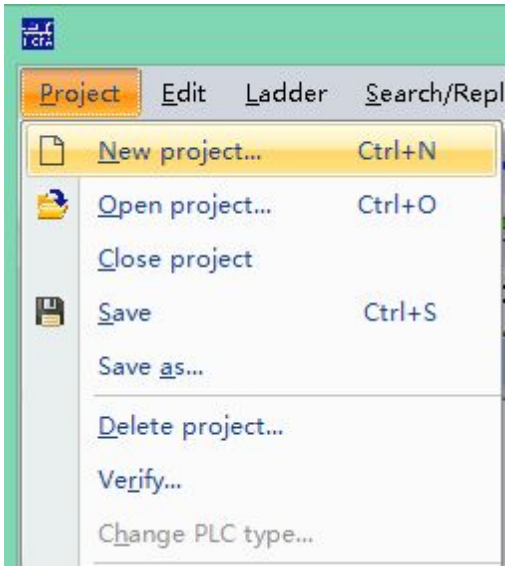
This section explains the common operation and management for HCP-Works.

3.1 Creating a Project

Creating a project

Operating procedure

Select [Project] ⇨ [New project]

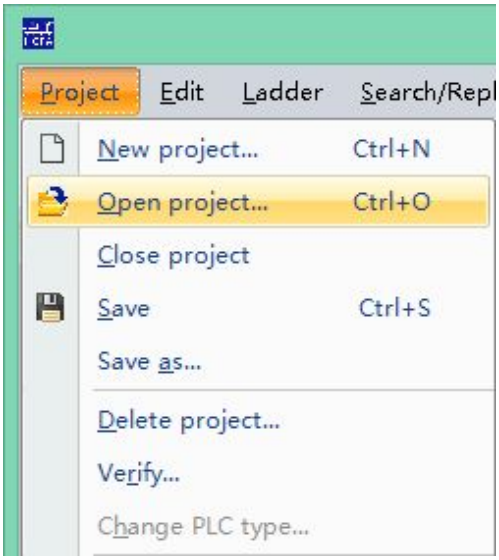


3.2 Opening a Project

Opening a project

Operating procedure

Select [Project] ⇨ [Open project]

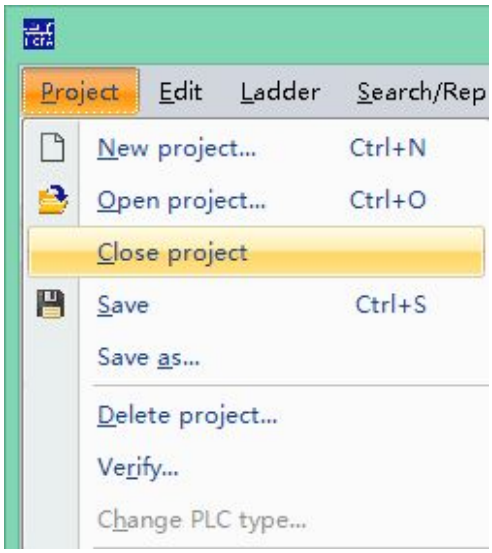


3.3 Closing a Project

Closing a project

Operating procedure

Select [Project] ⇨ [Close project]

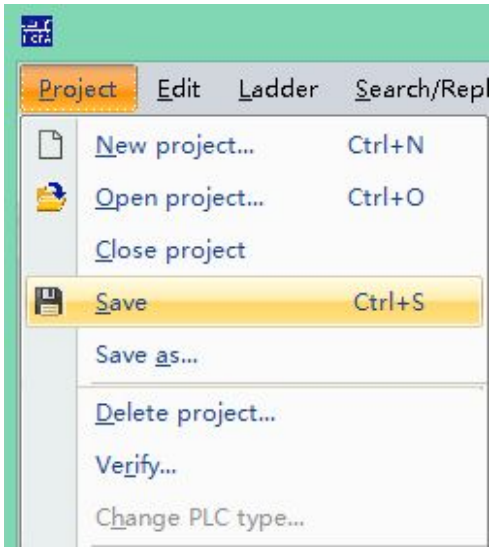


3.4 Saving a Project

Saving a project

Operating procedure

Select [Project] ⇨ [Save]

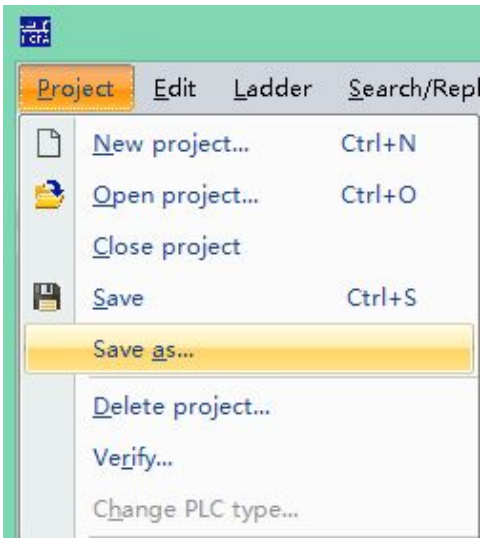


3.5 Saving a Project with a New Name

Save a project with a new name

Operating procedure

Select [Project] ⇨ [Save as]

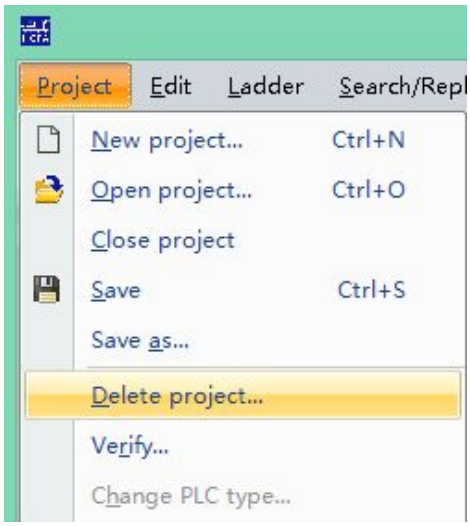


3.6 Deleting a Project

Deleting a project

Operating procedure

Select [Project] ⇨ [Delete project]

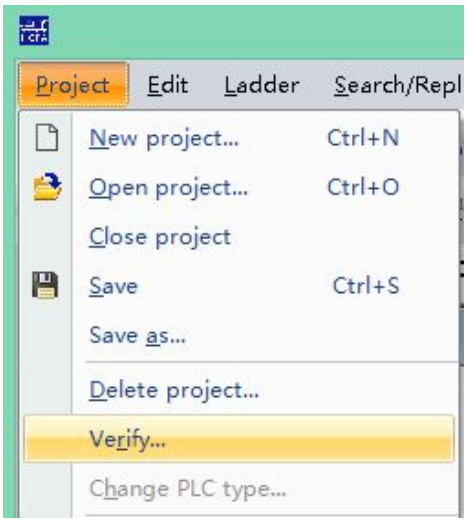


3.7 Verifying Data in Projects

Verifying data in projects

Operating procedure

Select [Project] ⇨ [Verify]

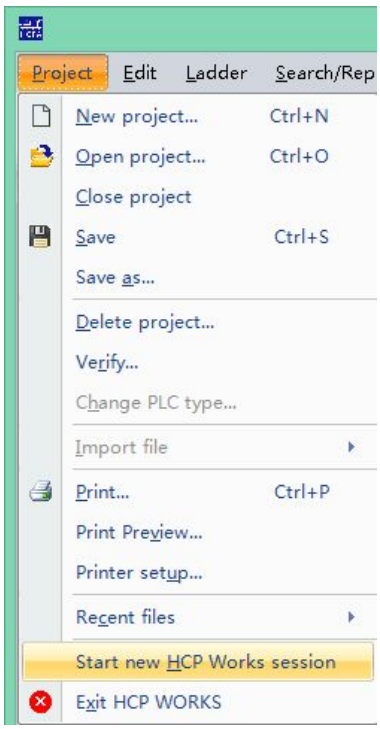


3.8 Starting Multiple Projects

Start multiple projects

Operating procedure

Select [Project] ⇨ [Start new HCP Works]



Chapter 4 Creating and Editing Ladder Programs

This section explains the functions of the ladder editor for editing ladder programs.

4.1 Precautions on Ladder Display Window

Precautions on ladder display window

1 . A created ladder block must be less than 24 lines. Excess lines cause an error.
2 . A ladder line can consist of 11 contacts plus 1 coil.
3 . The number of device comment edit characters can be set to 32 characters.

4.2 Precautions on Ladder Edit Window

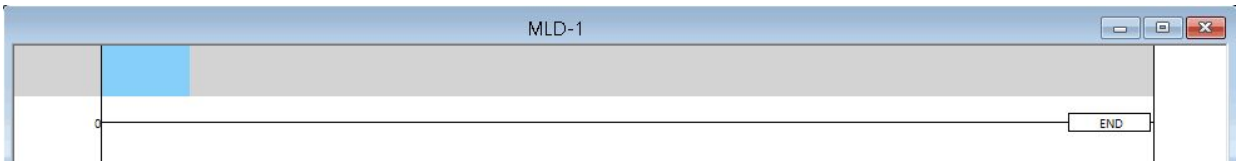
Precautions on ladder edit window

1 . The maximum number of edit lines per ladder block is 24.
2 . The maximum number of edit lines (24 lines/ladder block) is 48.
3 . Data up to 48 lines can be cut. The maximum block size is 124k steps.
4 . Data up to 48 lines can be copied. The maximum block unit is 124k steps.
5 . Data cannot be cut, copied and pasted in read mode.

4.3 Inputting Contacts and Applied Instructions

Contact input procedure

1 . Move the cursor to an input position.



2 . Enter the contact. (Double click or press “Enter”)

For input with list representation . Enter "LD X0" with the keyboard.

For input with tool buttons, click 

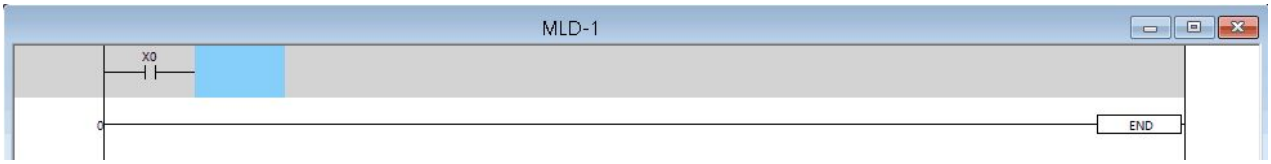
, and enter “X0” with the keyboard.

For input with function keys, press F5 key with the keyboard to enter “X0” .

3 . Press F4 key and click  button for inputting.

Application instruction input procedure

1 . Move the cursor to input position.



2 . Enter the application instruction.(Double click or press “Enter”).

For input with list representation . Enter "MOV K1 D0" with the keyboard.

For input with tool buttons, click 

, and enter "MOV K1 D0" with the keyboard.

For input with function keys, press F8 key with the keyboard to enter "MOV K1 D0".

Enter the Coil.(Double click or press “Enter”).

For input with list representation . Enter "OUT Y0" with the keyboard.

For input with tool buttons, click 

, and enter "OUT Y0" with the keyboard.

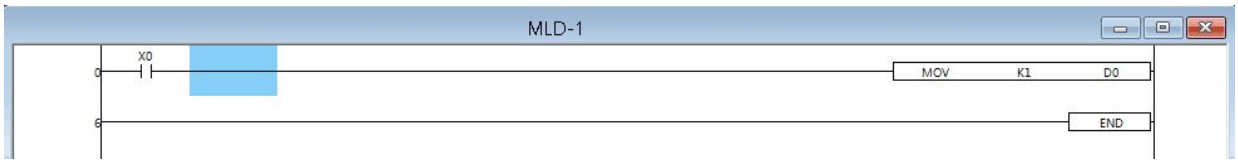
For input with function keys, press F7 key with the keyboard to enter "OUT Y0".

3 . Press F4 key and click  button for inputting.

4.4 Inputting lines (Vertical or Horizontal Lines)

Drawing lines

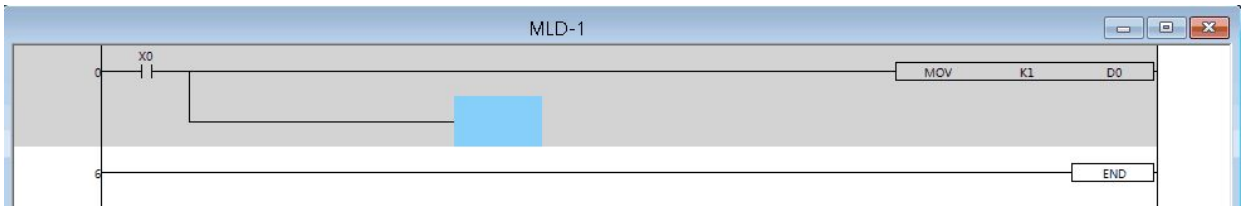
1 . Move the cursor to a connecting line input position.



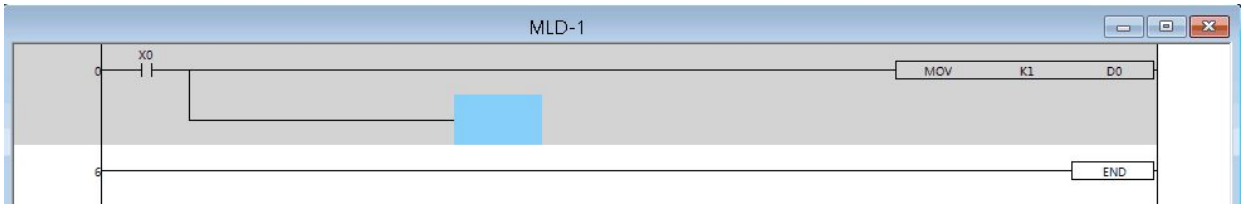
2 . Draw a line.

For input with tool buttons, click 

and drag the cursor to draw a line.



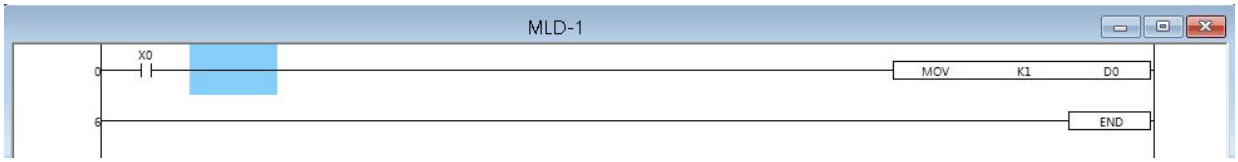
For input with function keys, press F10 key and drag the cursor to draw a connecting line.



3 . Press F4 key and click  button for inputting.

Drawing vertical line

1 . Move the cursor to a vertical line input position.



2 . Draw a vertical line.

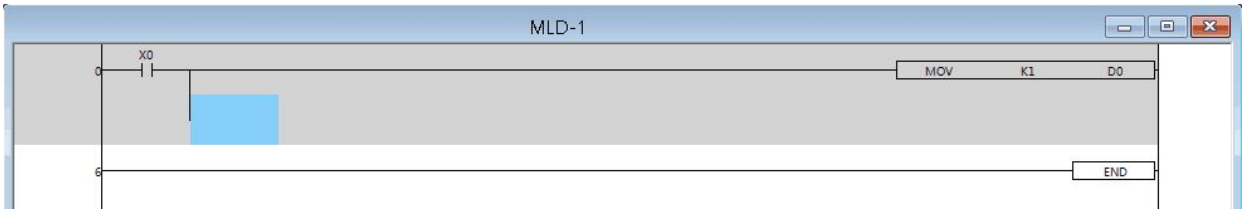
For input with tool buttons, click  or press (Shift+F9) to enter the number of vertical lines to be input in the vertical line input window.

3 . Click "OK" button to make input in the edit window.

4 . Press F4 key and click  button for inputting.

Drawing horizontal line

1 . Move the cursor to a horizontal line input position.



2 . Draw a horizontal line.

For input with tool buttons, click  or press F9 in the keyboard and enter the number of horizontal lines to be input in the horizontal line input window.

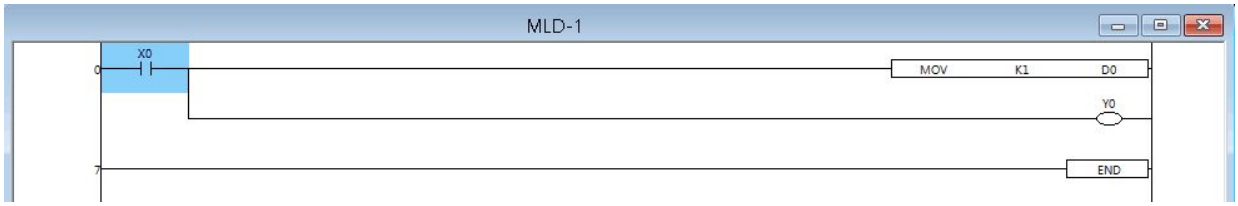
3 . Click "OK" button to make input in the edit window.

4 . Press F4 key and click  button for inputting.

4.5 Deleting Contacts and Applied Instructions

Deleting procedure

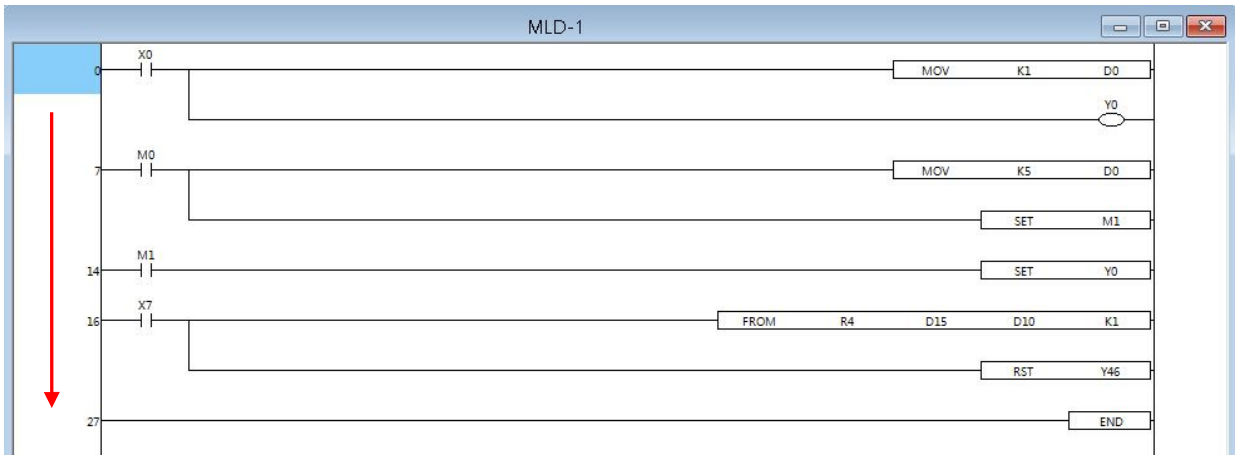
1 . Move the cursor to a contact or an application instruction to be deleted.



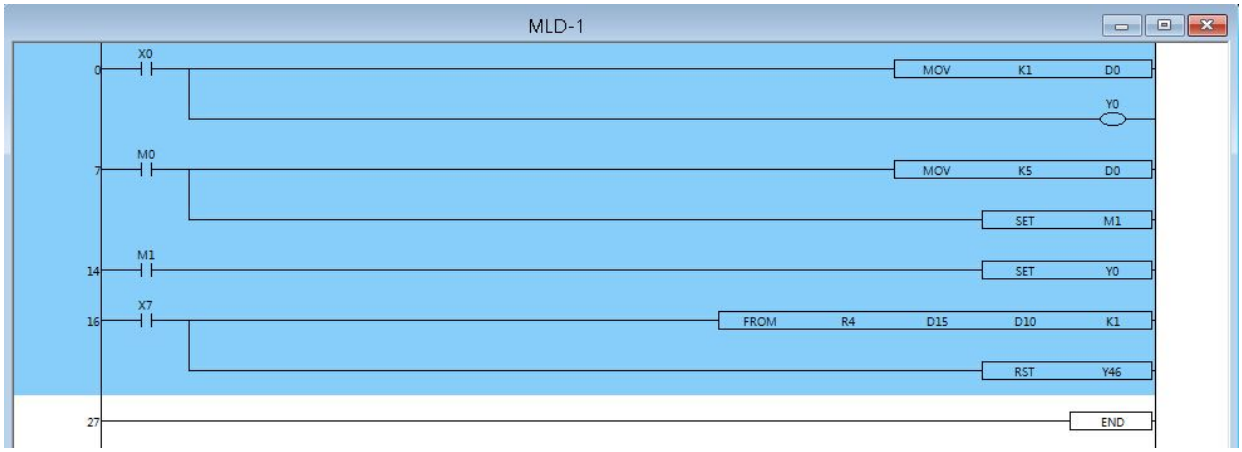
2 . Press “Delete” key.

Deleting all programs created

1 . Move the cursor to the outside of the left base line at the top of the program.



2 . Drag the cursor just before the END instruction.

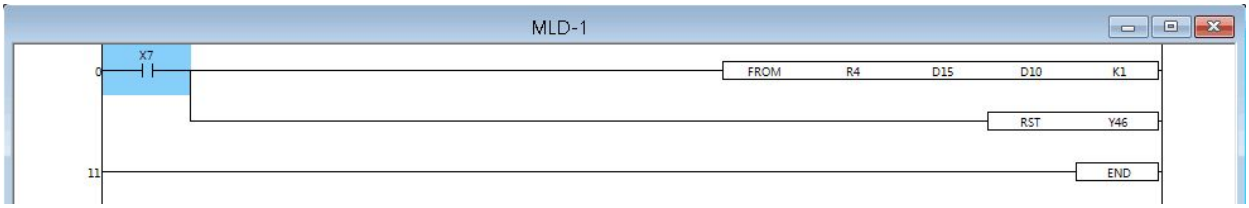


3 . Press “Delete” key.

4.6 Deleting Connecting Lines

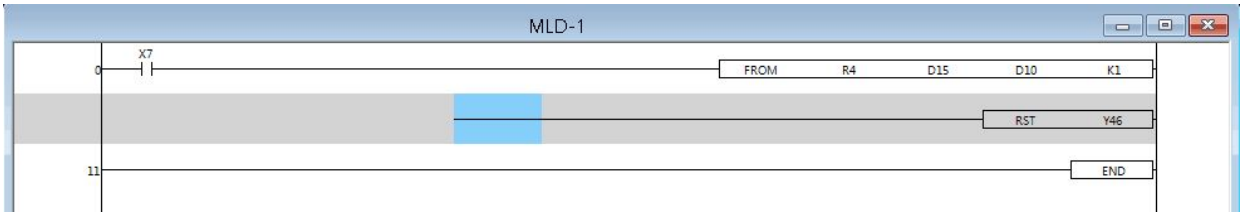
Deleting procedure

1 . Move the cursor to a connecting line to be deleted.



2 . Delete the connecting line.

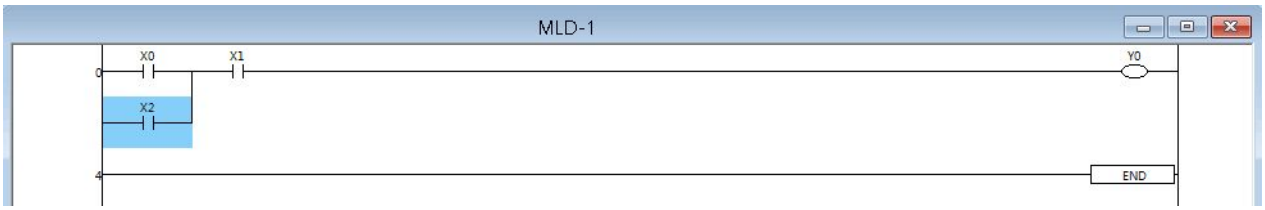
For deletion with tool buttons, click  and drag the cursor through a line to be deleted.



4.7 Inserting/Deleting a Line between Ladder Blocks

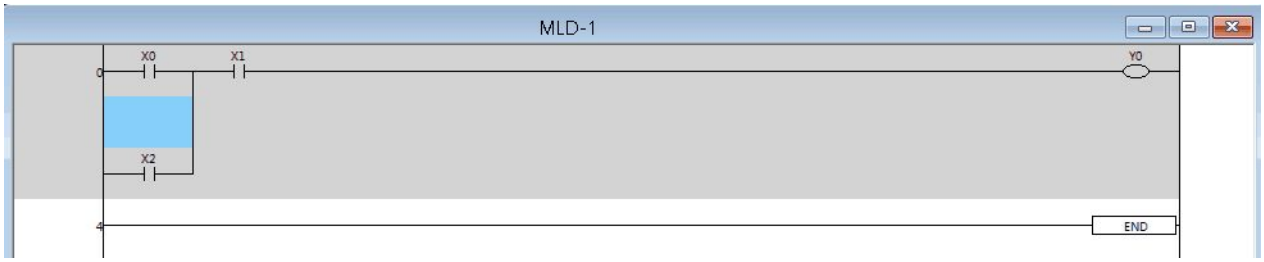
For line insertion (in one-ladder block)

1 . Move the cursor to a line to be inserted.



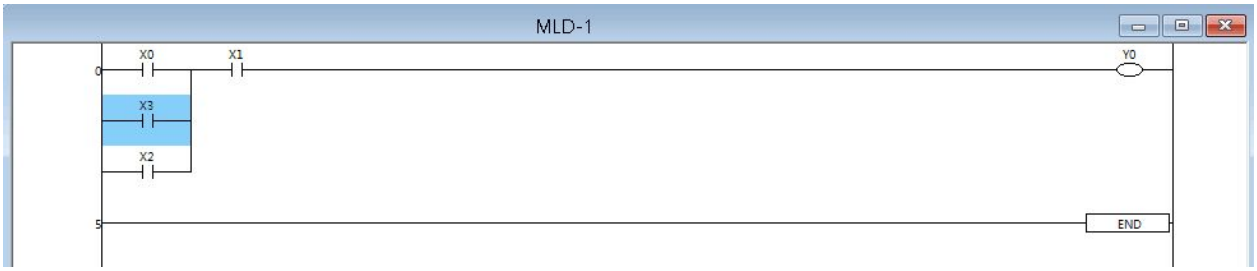
2 . Insert the line.

For insertion with function keys, press (Shift key+ Insert key) to insert a line.
For insertion with menu,
Select【Edit】⇨【Insert row】to insert a line.



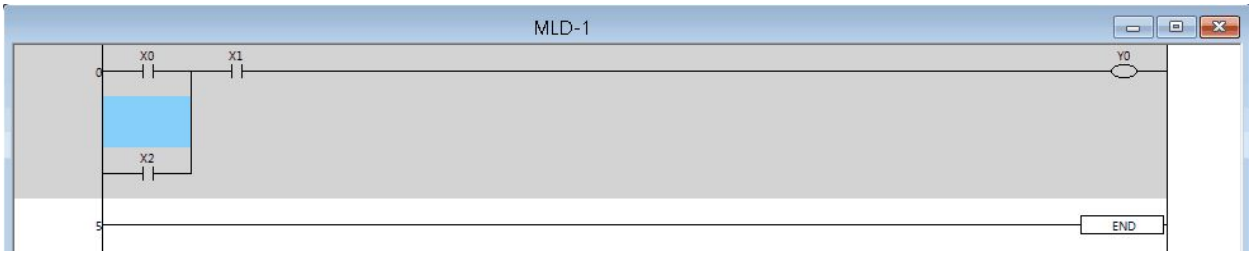
For line deletion (in one-ladder block)

1 . Move the cursor to a line to be deleted.



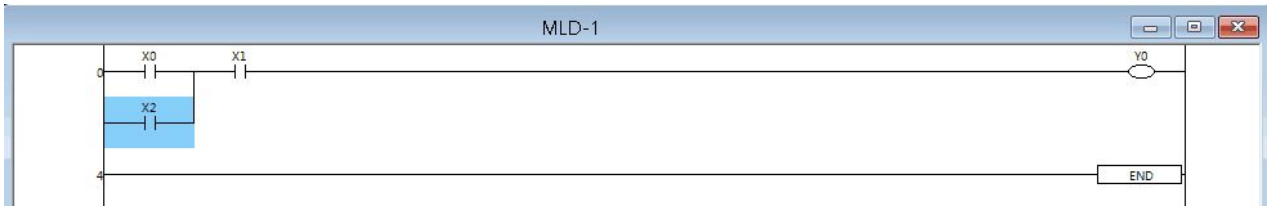
2 . Delete the line.

For deletion with function keys, press (Shift key + Delete key) to delete a line.
For deletion with menu
Select【Edit】⇨【Delete row】to delete a line.



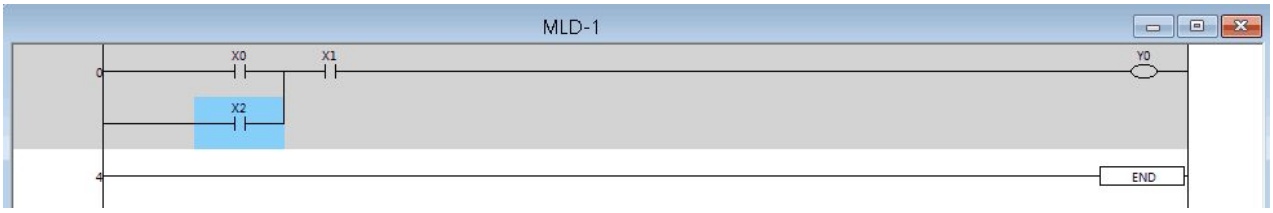
For column insertion (in one-ladder block)

1 . Move the cursor to a column to be inserted.



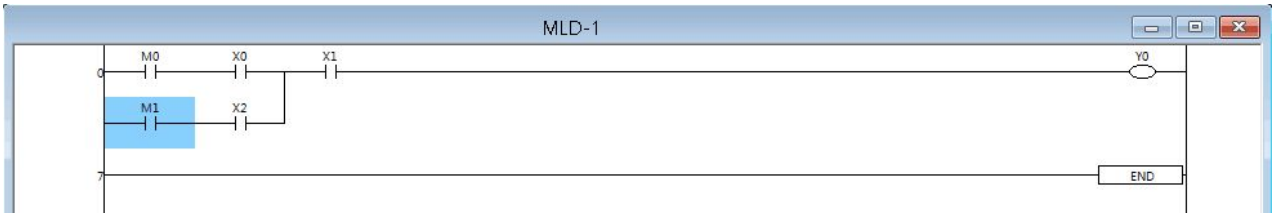
2 . Insert the column.

For insertion with function keys, press (Ctrl key + Insert key) to insert a column.
For insertion with menu
Select【Edit】⇨【Insert column】to insert a column.



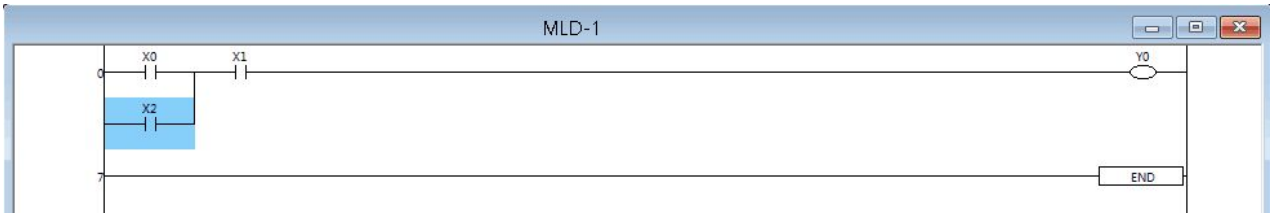
For column deletion (in one-ladder block)

1 . Move the cursor to a column to be deleted.



2 . Delete the column.

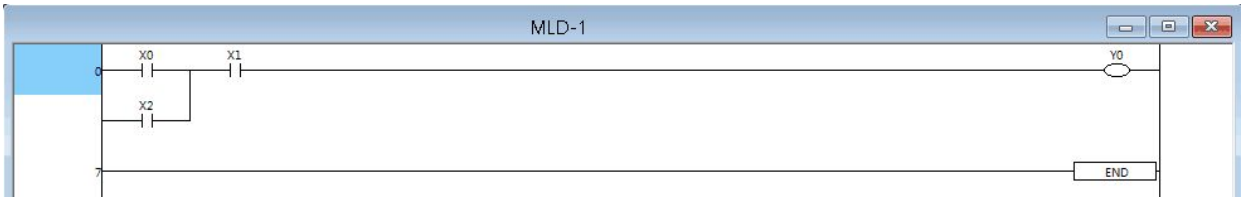
For deletion with function keys, press(Ctrl key + Delete key) to delete a column.
For deletion with menu
Select【Edit】⇨【Delete column】to delete a column.



4.8 Entering a Pointer (P) and Interrupt Pointer (I)

Entry procedure

1 . Move the cursor to the left of the base line where a pointer (P) or interrupt pointer (I) is to be entered.



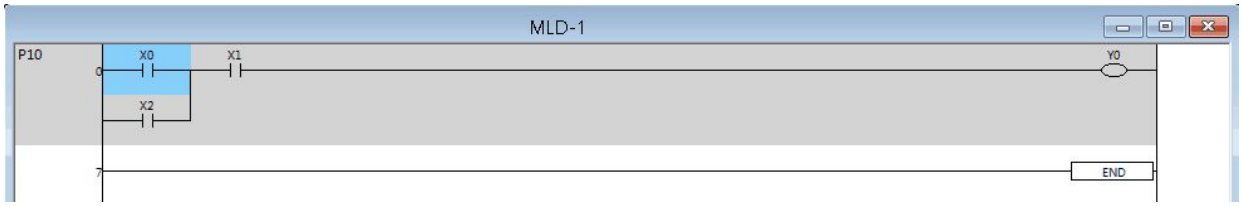
2 . Enter a pointer (P) or interrupt pointer (I).

When entering a pointer P10,
Enter “P10” on the keyboard.

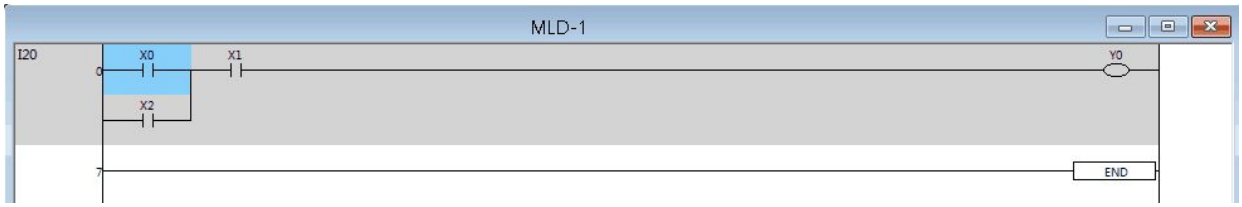
When entering an interrupt pointer I20,
Enter “I20” on the keyboard.

3 . Click the “OK” button.

When entering a pointer P10



When entering an interrupt pointer I20

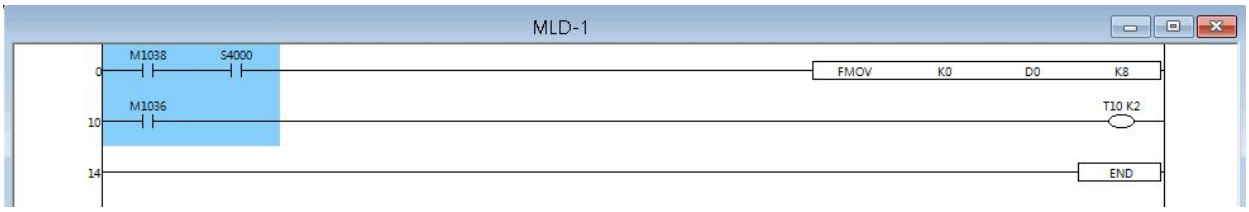


4 . Convert the ladder by pressing the F4 key or clicking the  button.

4.9 Cutting, Copying and Pasting Ladders

Cutting/Copying the ladder

1 . Specify the range of the cut/copied ladder



2 . Cut or copy the specified range of ladder.

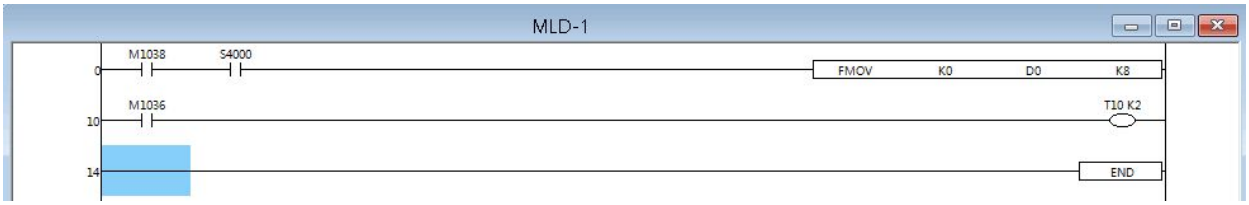
For cutting,

Select【Edit】⇨【Cut】or click  , (Ctrl +X) .

For copying,

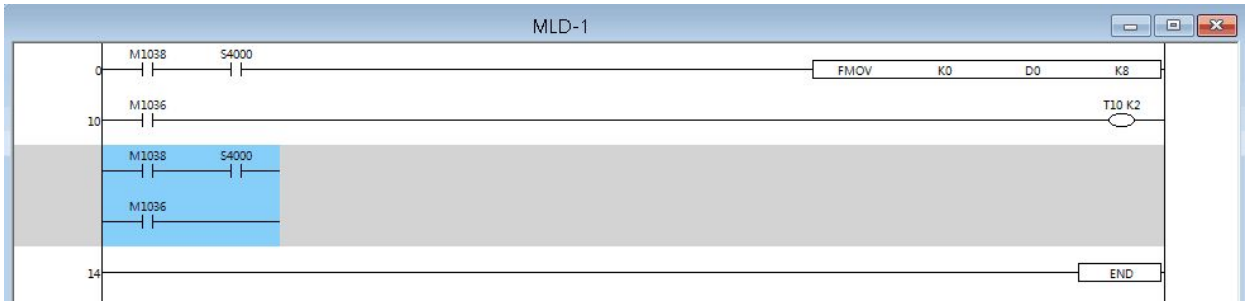
Select【Edit】⇨【Copy】or click  , (Ctrl +C) .

3 . Click the location in which the cut or copied circuit is to be pasted to set the cursor there.



4 . Paste the ladder.

Select【Edit】⇨【Paste】or click  , (Ctrl +V) .



5 . Press F4 key and click  button for inputting.

4.10 Undoing and Redoing the Last Operation

Purpose

Cancel the last operation (cut, copy, or paste) and restore the previous state.

【Operating procedure】

Select【Edit】⇨【Undo】。

【The following states can be restored.】

1 . Row insertion, row deletion
2 . Column insertion, column deletion
3 . Connecting line input, connecting line deletion
4 . Instruction input
5 . Cut and paste within a specified range
6 . Ladder deletion by ”Delete”or”Back Space”keys.

【The following states cannot be restored.】

1 . After ladder conversion
2 . Abandoning the ladder not converted yet
3 . Replacement, inserting or deleting NOPs at a time
4 . Search after cut or paste in units of ladder blocks
5 . Errors due to cut, etc.

Chapter 5 Comments, Statements and Notes

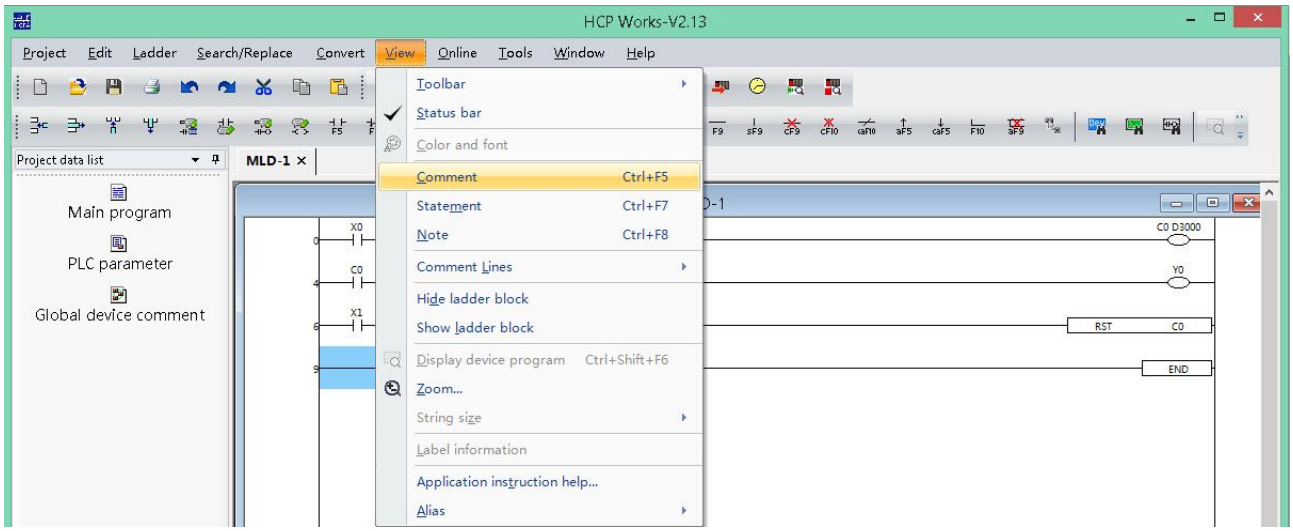
This chapter explains how to create and edit comments, statements and notes .

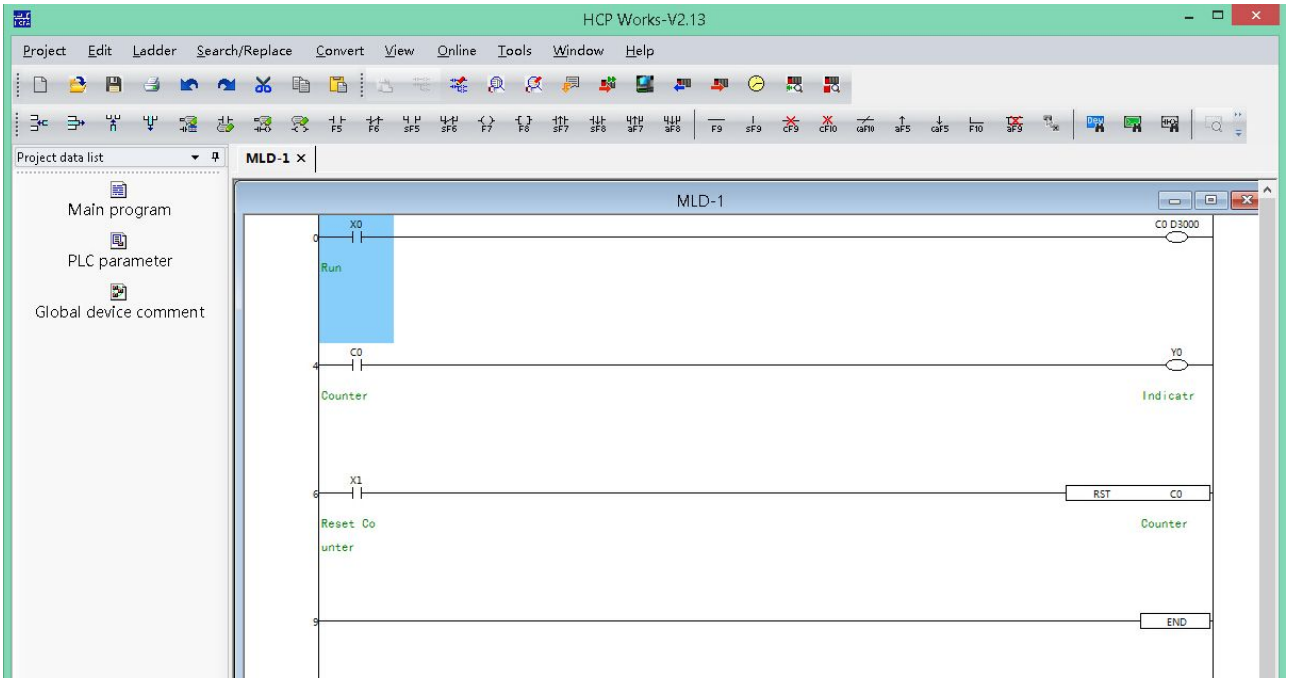
5.1 Creating Device Comments

Creating device comments in the ladder window

【Operating procedure】

Select【View】⟹【Comment】 or click  .



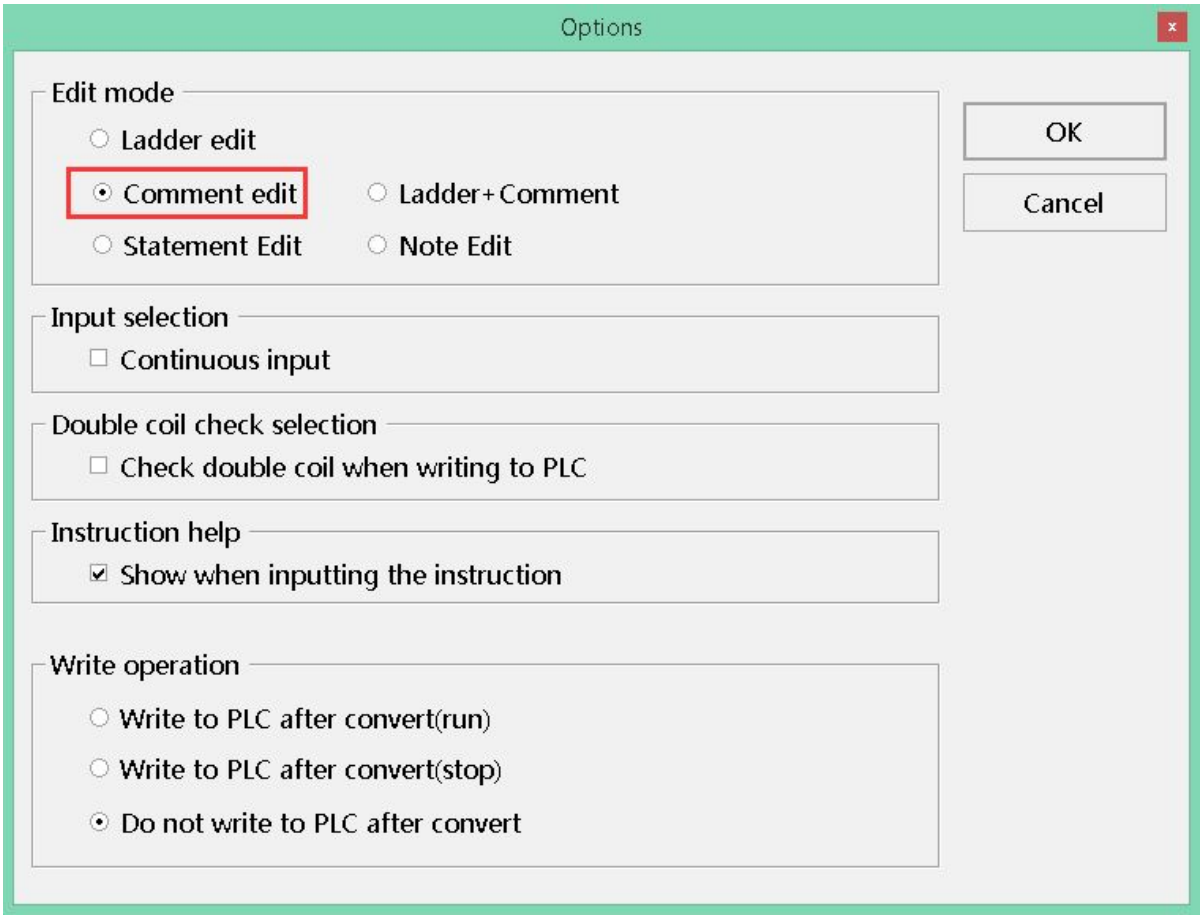


5.2 Creating Device Comments for the Created Ladder

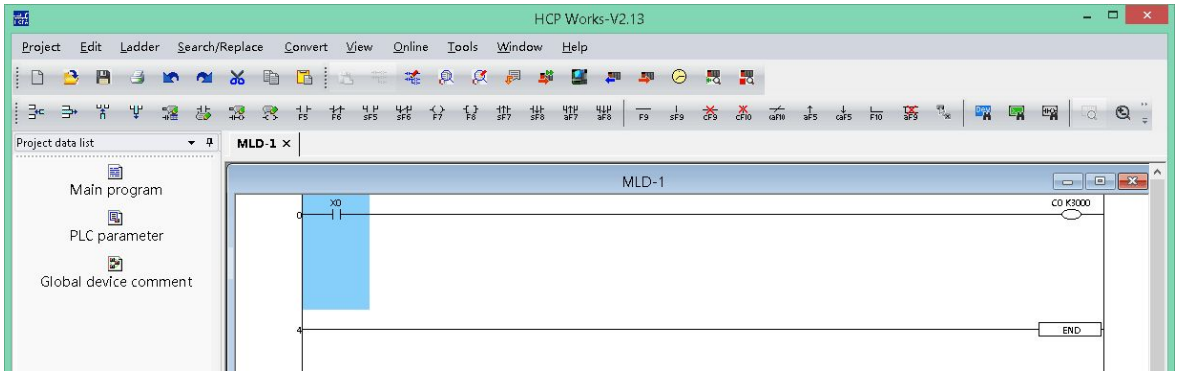
Creating device comments for the created circuit

【Operating procedure】

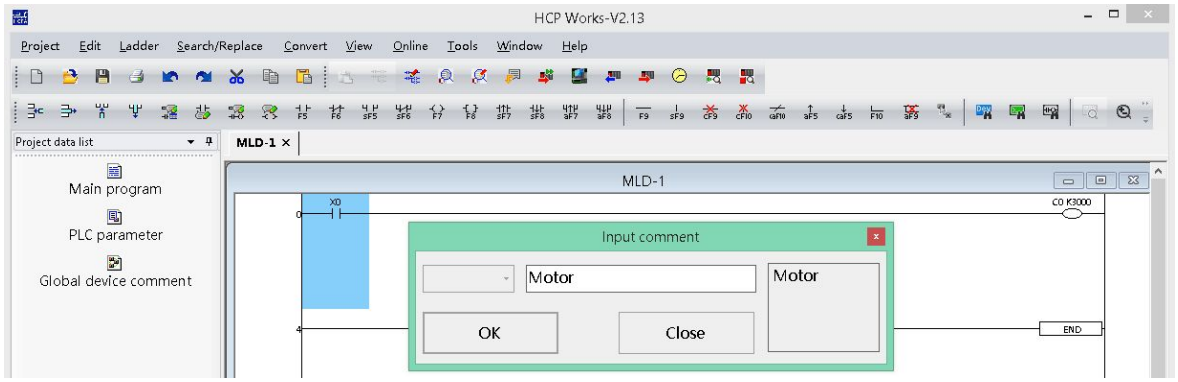
1 . Select【Tools】⇨【Options】.



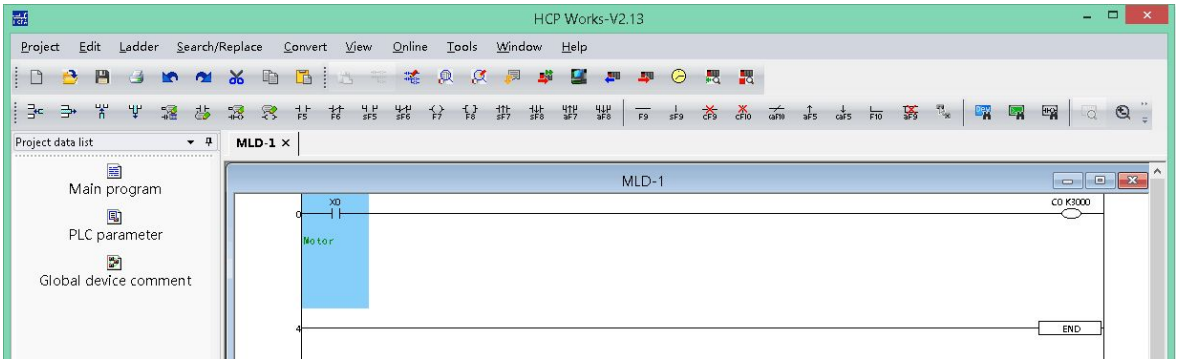
2 . Move the cursor to a device comment creation location and double click or press the “Enter” key.



3 . Make settings as follows for the ladder input dialog box.



4 . Comment display takes place as follows.

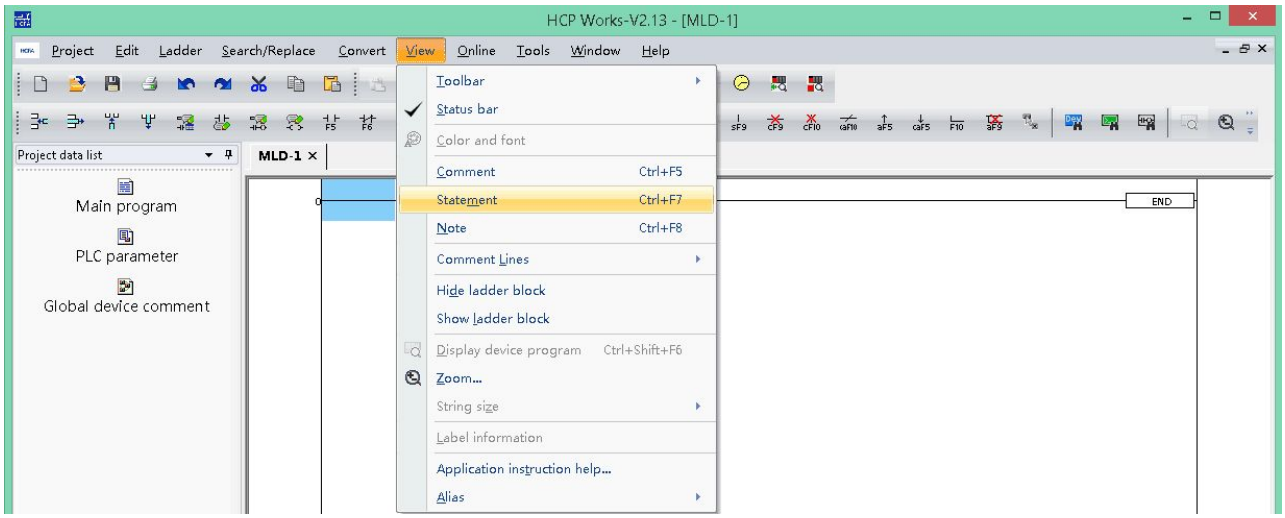


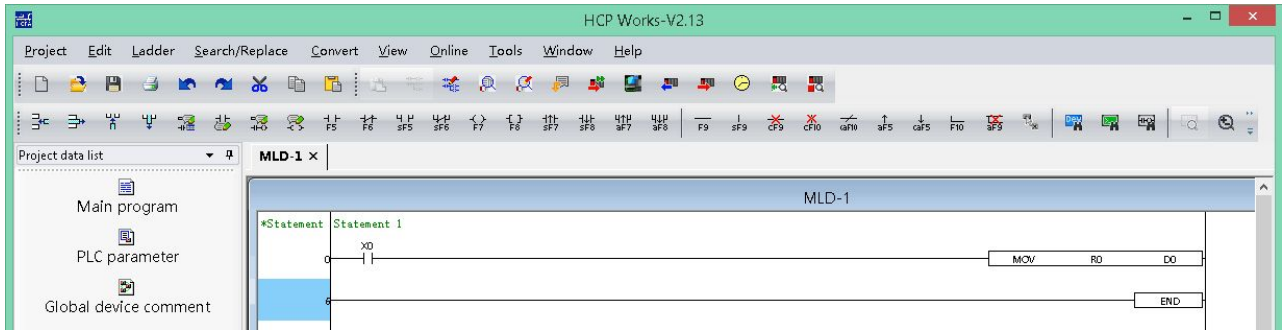
5.3 Creating Statements

Creating statements in the ladder window

【Operating procedure】

Select【View】⟹【Statement】。



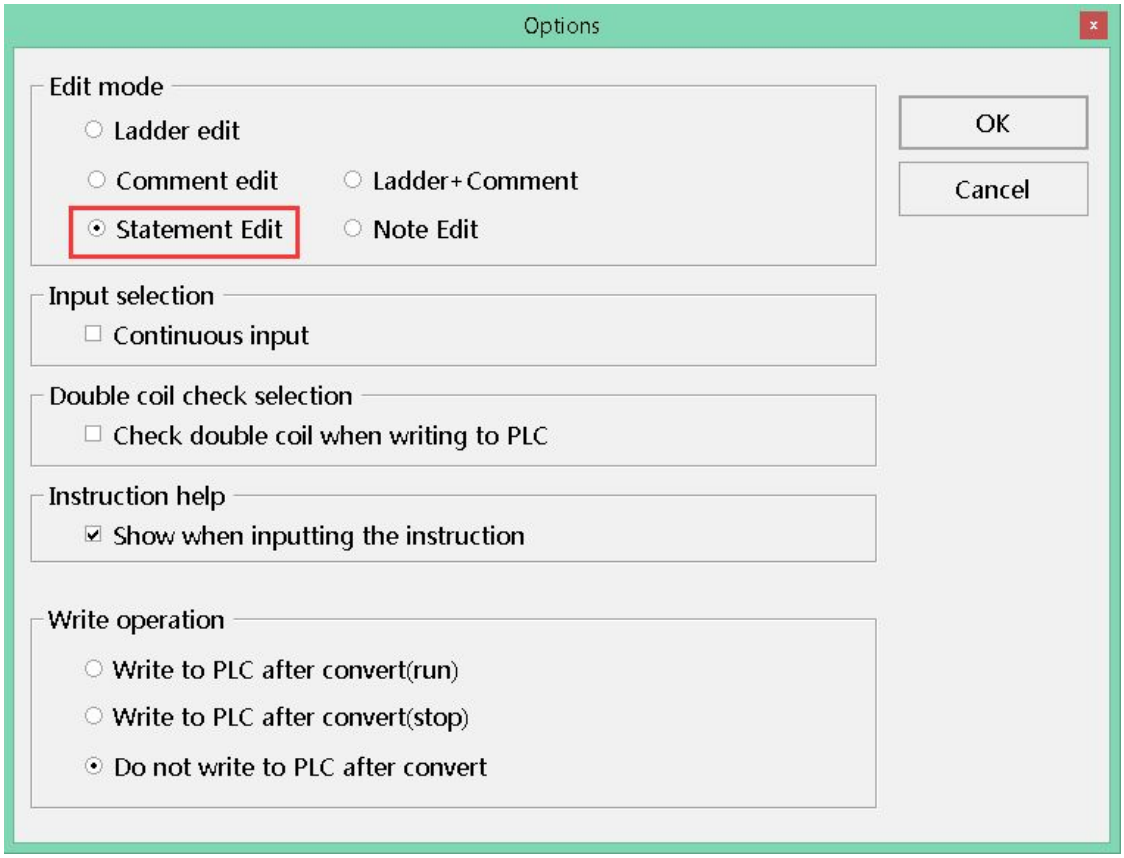


5.4 Switching to Statement Edit Mode

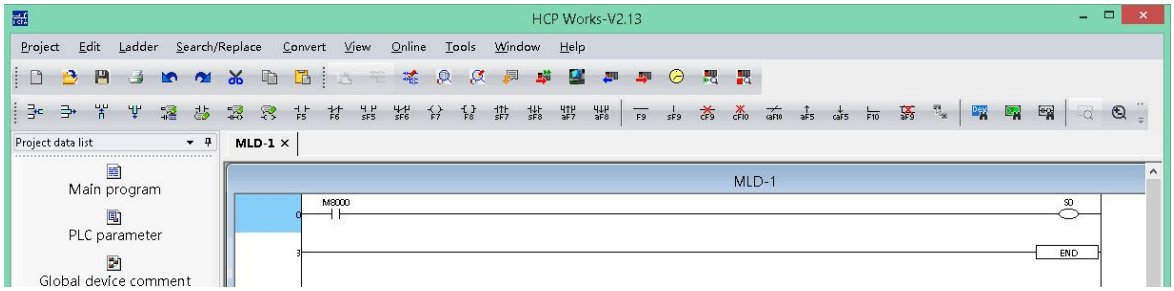
Creating statements in the ladder window

【Operating procedure】

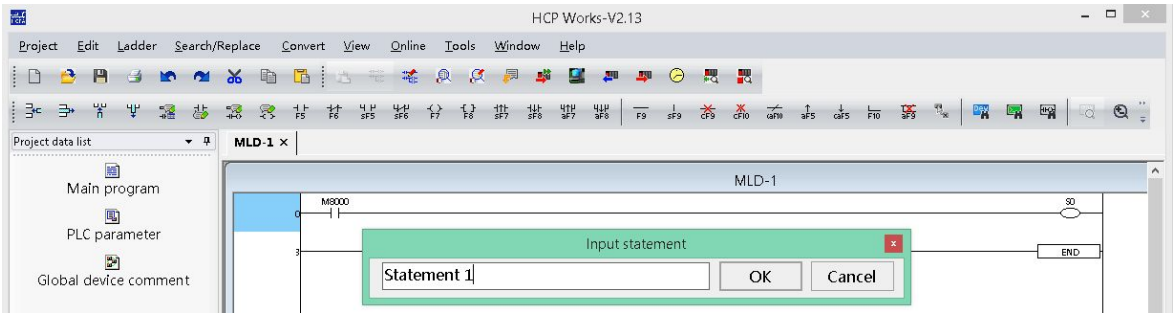
1 . Select【Tools】⇨【Options】 。



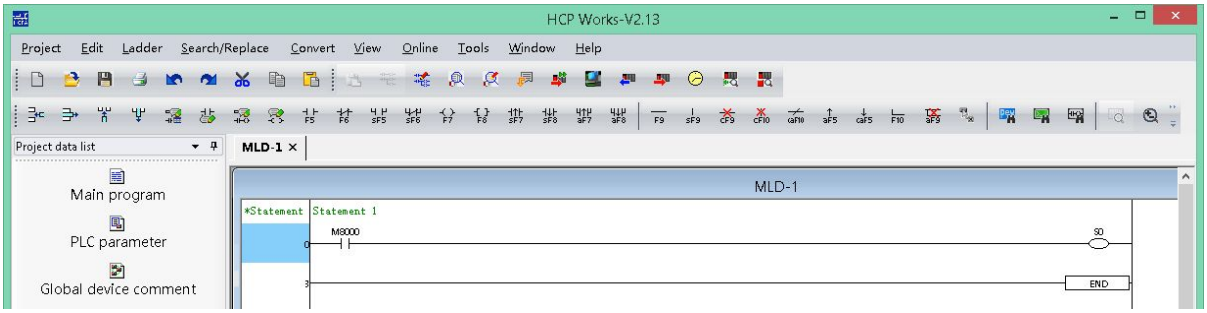
2 . Move the cursor to the position shown in the following figure. Double click the left mouse button or press “ENTER” key .



3 . Enter the statements in the ladder input dialog box and click “OK” .



4 . Statements has been created .

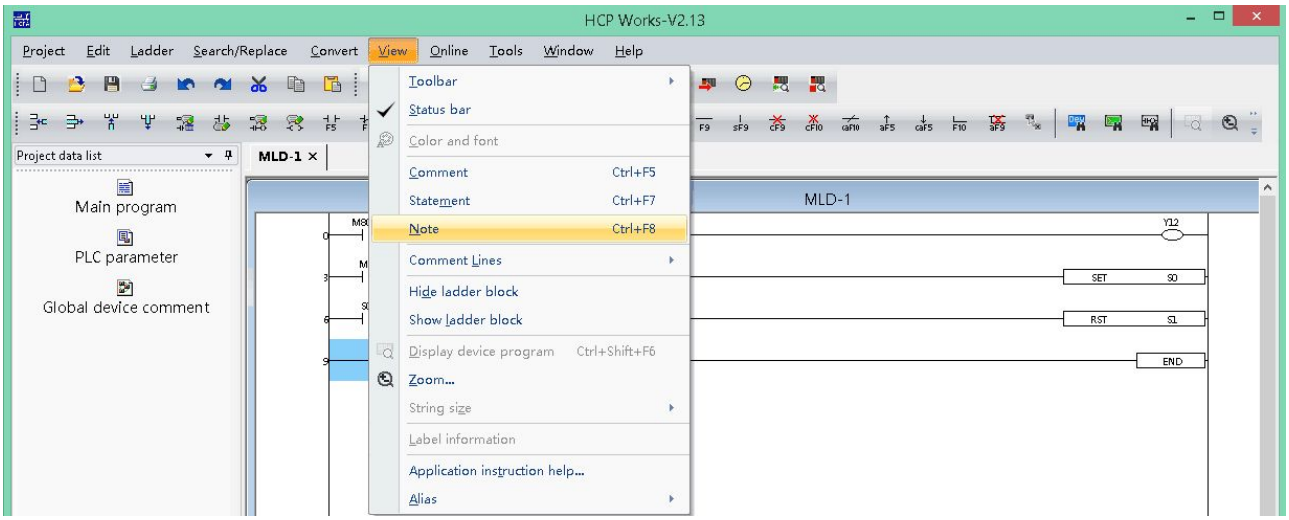


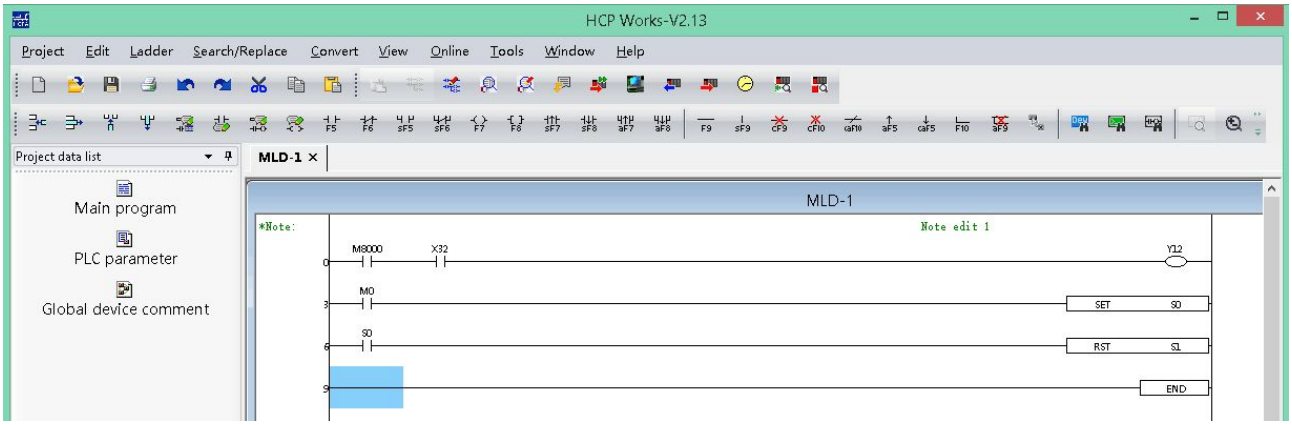
5.5 Creating Notes

Creating notes in the ladder window

【Operating procedure】

Select【View】⇨【Note】。



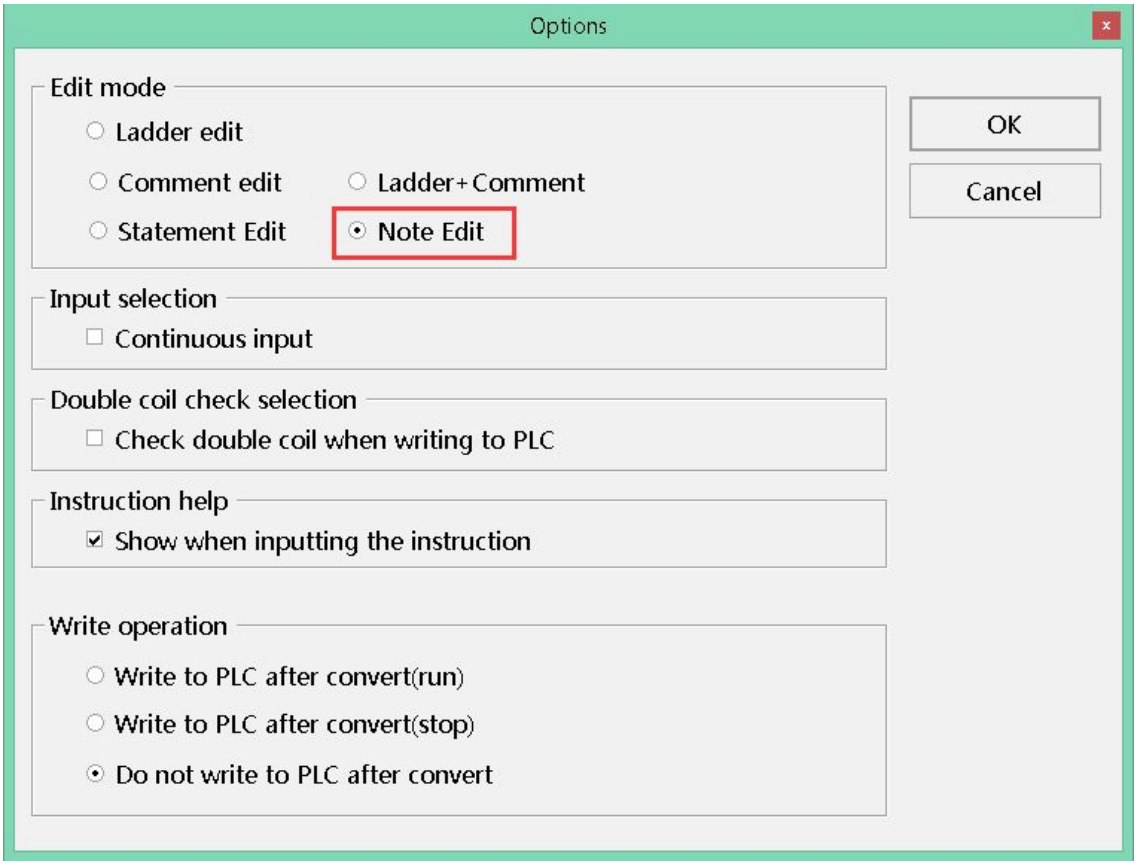


5.6 Switching to Note Edit Mode

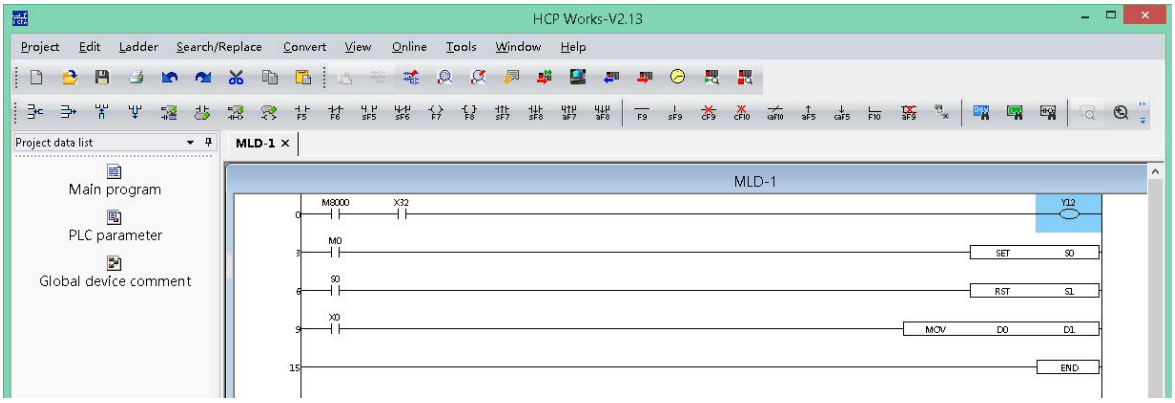
Creating notes in the ladder window

【Operating procedure】

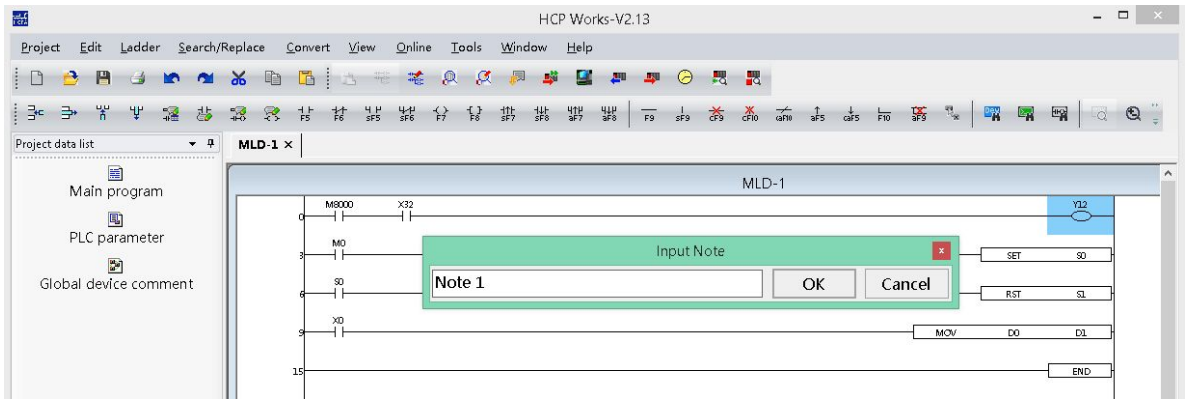
1 . Select【Tools】⇨【Options】 。



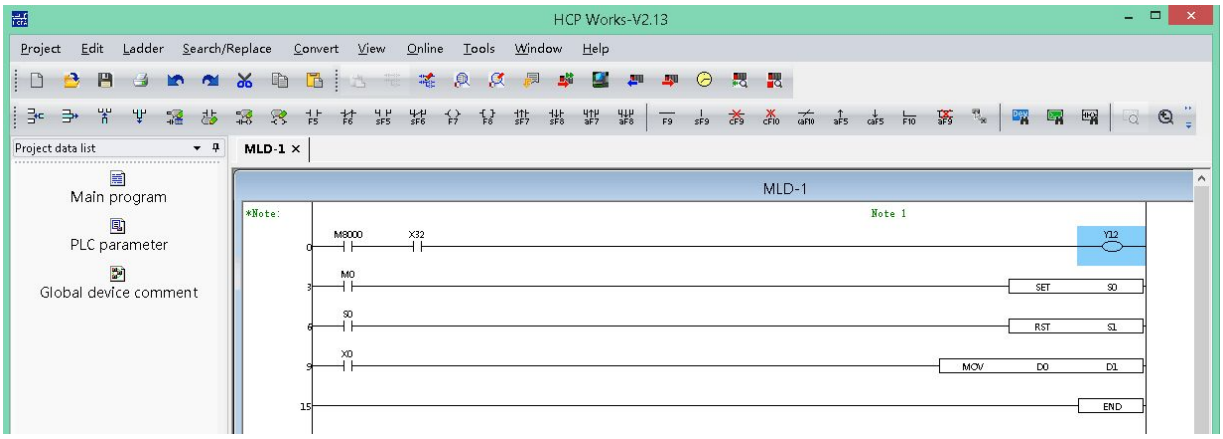
2 . Move the cursor to the position shown in the following figure. Double click the left mouse button or press “ENTER” key.



3 . Enter the notes in the ladder input dialog box and click “OK” button .



4 . Notes have been created.



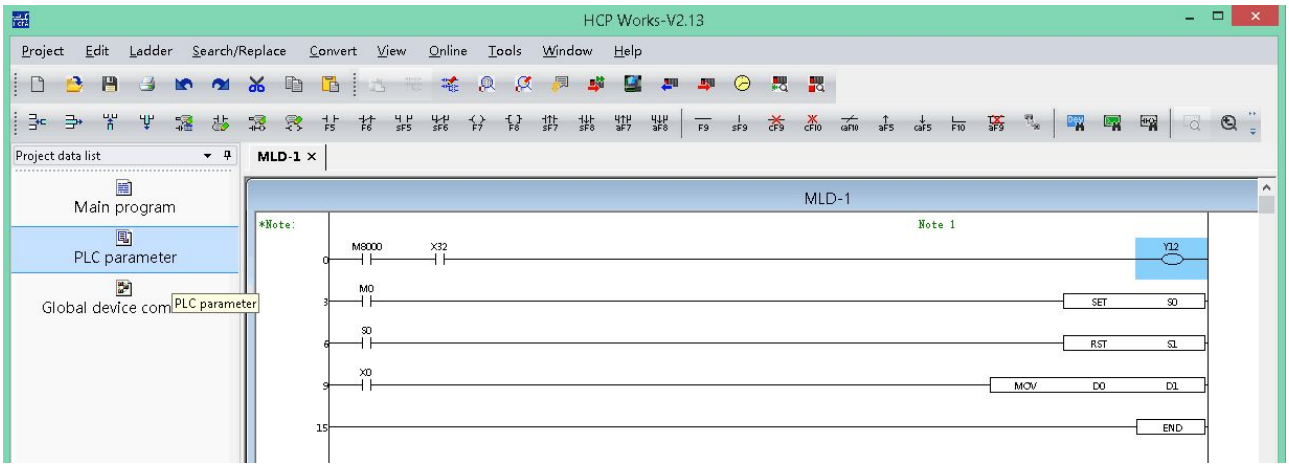
Chapter 6 Setting the Parameters

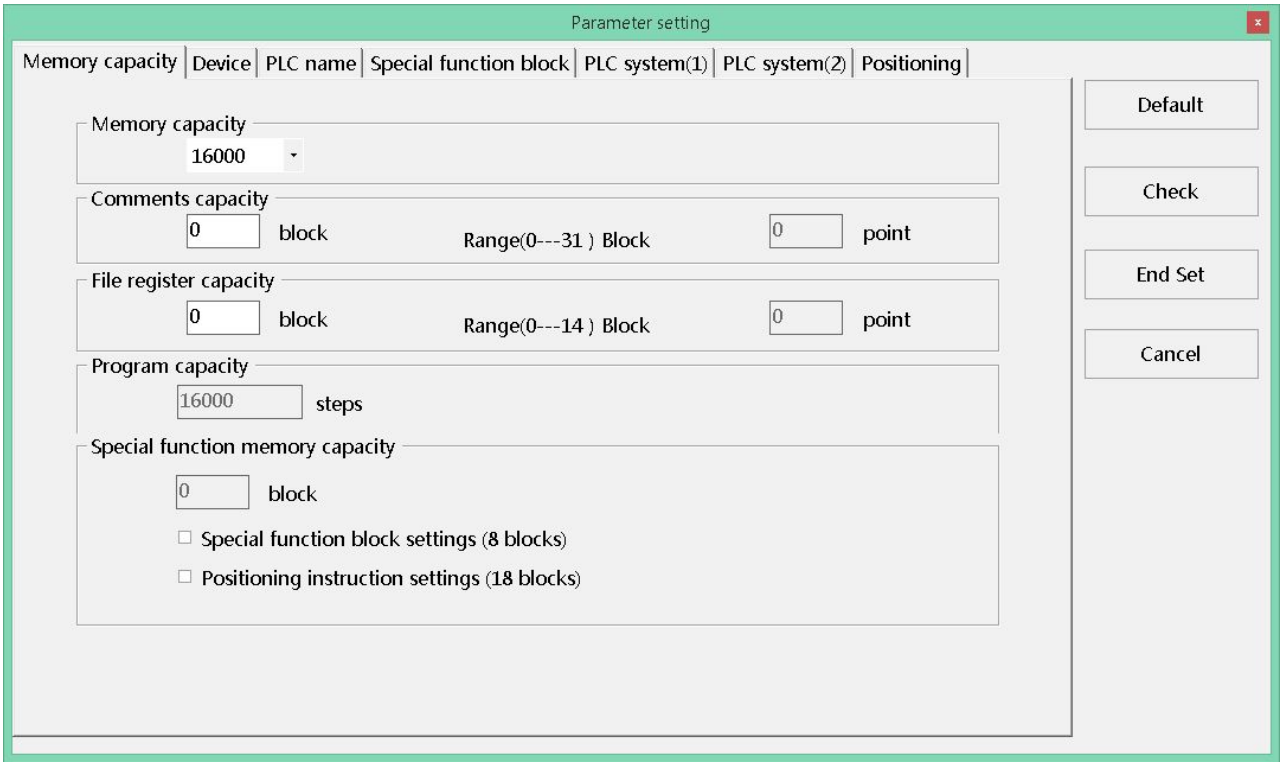
This chapter explains the operations for the parameters.

6.1 Setting the PLC Parameters

Screen display

Double click【Project parameter】in the navigation project list ⇨【PLC parameter】to set the parameters.



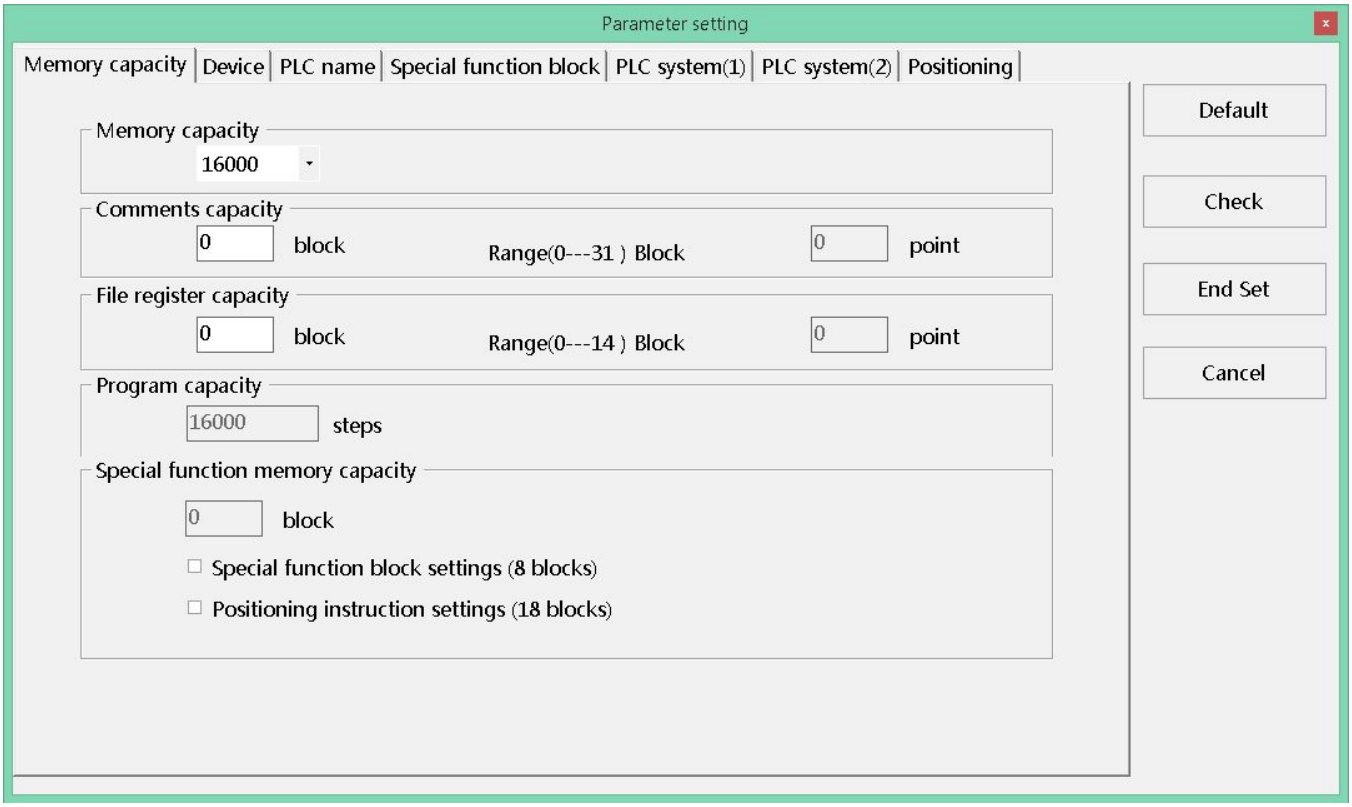


6.2 PLC Parameter Item Lists

Classification	Project	Contents
Memory capacity setting	Memory capacity	Set the PLC memory capacity.
	Comment	Set the comment capacity.
	File register	Set the file register capacity.
	Program capacity	Set the sequence program capacity
	Special function memory capacity	Set the initial values and positioning of the special modules/blocks.
Device setting	Device	Set the latch range.
PLC name	Title	Comment the PLC program.
PLC system 1	Battery less mode	Make this setting when performing operation without the memory backup battery
	MODEM initialized	Set the modem initialization command when making remote access to the PLC
	RUN terminal input	When using the input (X) of the PLC as the external RUN/STOP terminal, set its input number.
PLC system 2	Protocol	Set the communication protocol.
	Data length	Set the data length.
	Parity	Set the parity.
	Stop bit	Set the stop bit.
	Transmission speed	Set the transmission speed.
	Header	Set the header.
	Terminator	Set when making the terminator valid.
	Control line	Set when making the control line valid.
	H/W type	Normally choose RS-232 or RS-485.
	Control mode	Display the control mode data.
	Sum check	Set when adding sum check.
	Transmission control procedure	Choose format 1/format 4.
	Station number setting	Make station number setting.
	Time out judge time	Set the time-out period.
Positioning	Positioning	Set the bias speed, the max. speed, the creep speed, the zero return speed, the acceleration time, the deceleration time, the interruption input of DVIT instruction of each axis for internal PLC positioning function.

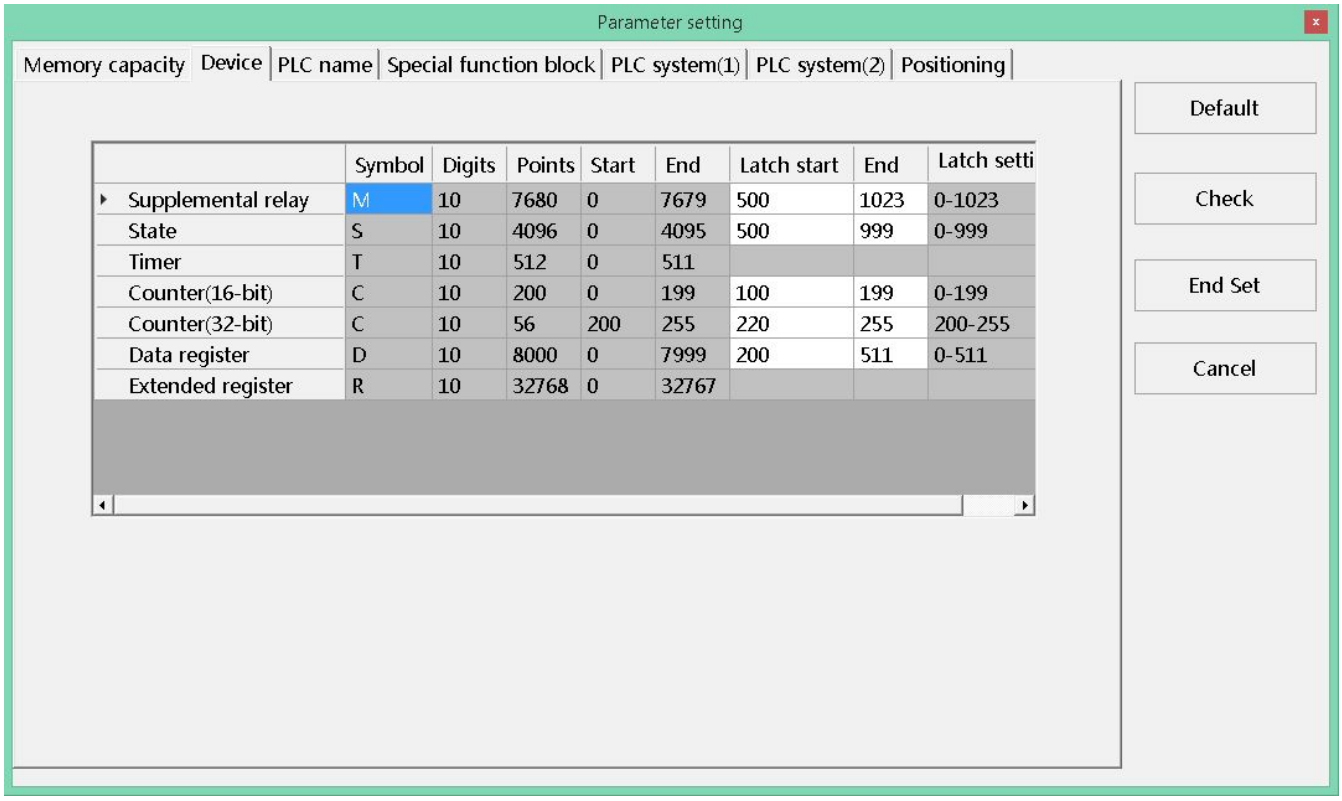
6.3 Explanations for PLC Parameter Setting Screen

Setting memory capacity



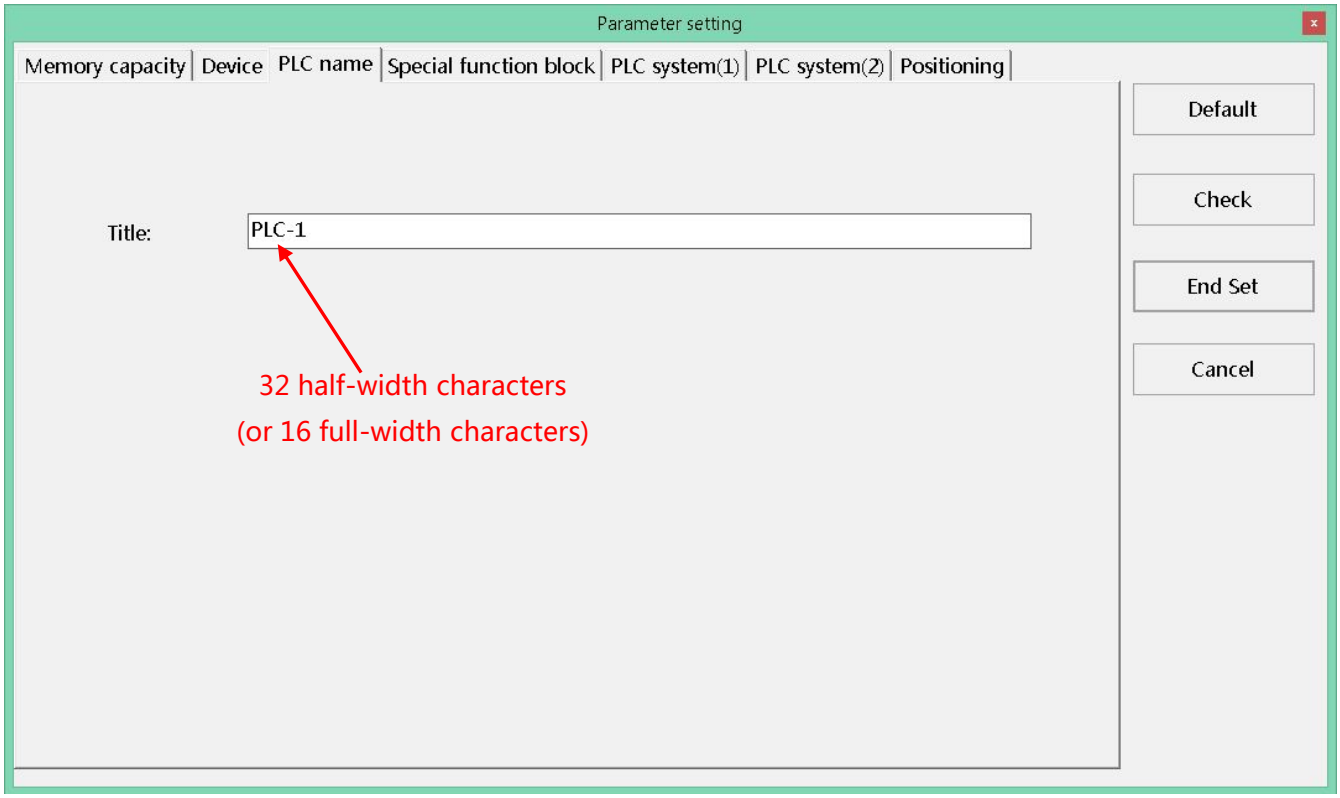
Set item	Contents Of Setting	Setting range
Memory capacity	Set the program memory capacity . Initial value: 16000.	-
Comments capacity	Set the capacity of comments to be stored in the PLC. Initial value: 0 50 device comments/block (500 steps)	-
File register capacity	Set the file register capacity. Initial value: 0 500 file registers/block (500 steps)	-
Program capacity	The number of steps available for sequence program is displayed here.	-
Special function memory capacity	Select whether the special unit initial value settings and positioning settings will be used or not.	-

Setting devices （Set the latch range）

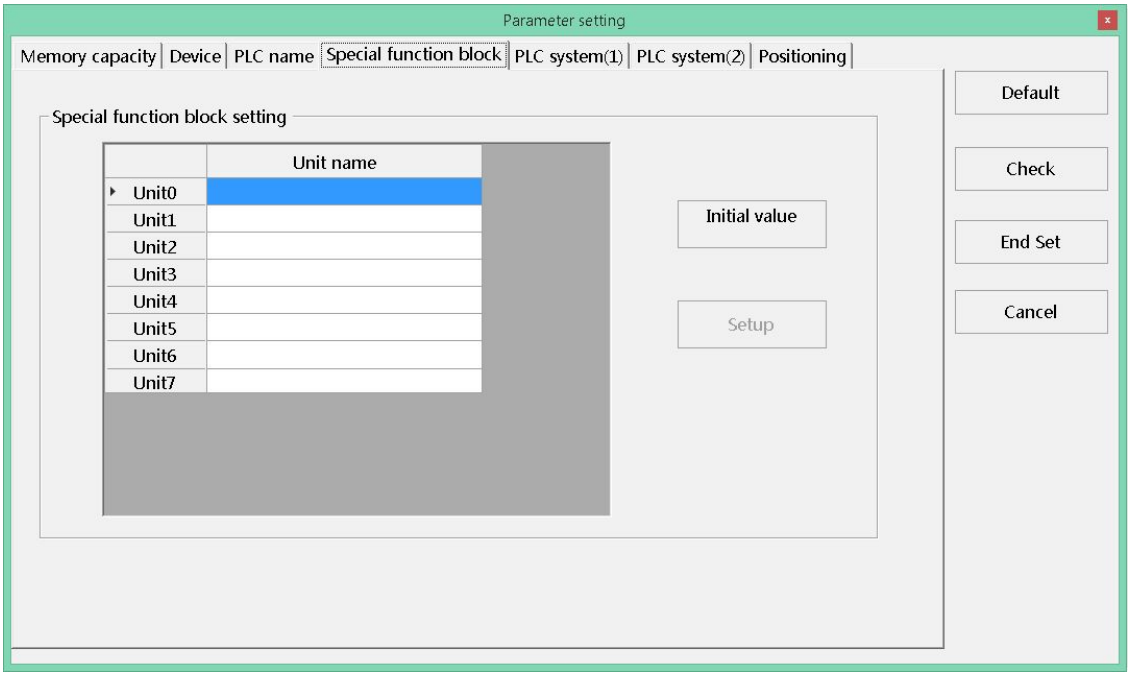


Set item	Contents Of Setting	Setting range
Supplemental relay	Set the latched (battery backed) auxiliary relay range. Initial value: 500 to 1023	0 to 1023
State	Set the latched (battery backed) state relay range. Initial value: 500 to 999	0 to 999
Timer	The setting displayed here cannot be changed.	-
Counter (16bit)	Set the latched (battery backed) 16-bit counter range. Initial value: 100 to 199	0 to 99
Counter (32bit)	Set the latched (battery backed) 32-bit counter range. Initial value: 220 to 255	220 to 255
Data register	Set the data register range (battery backed). Initial value: 200 to 511	0 to 511
Extended register	All extension registers are latched (battery backed). This setting is fixed, and cannot be changed.	-

PLC name setting

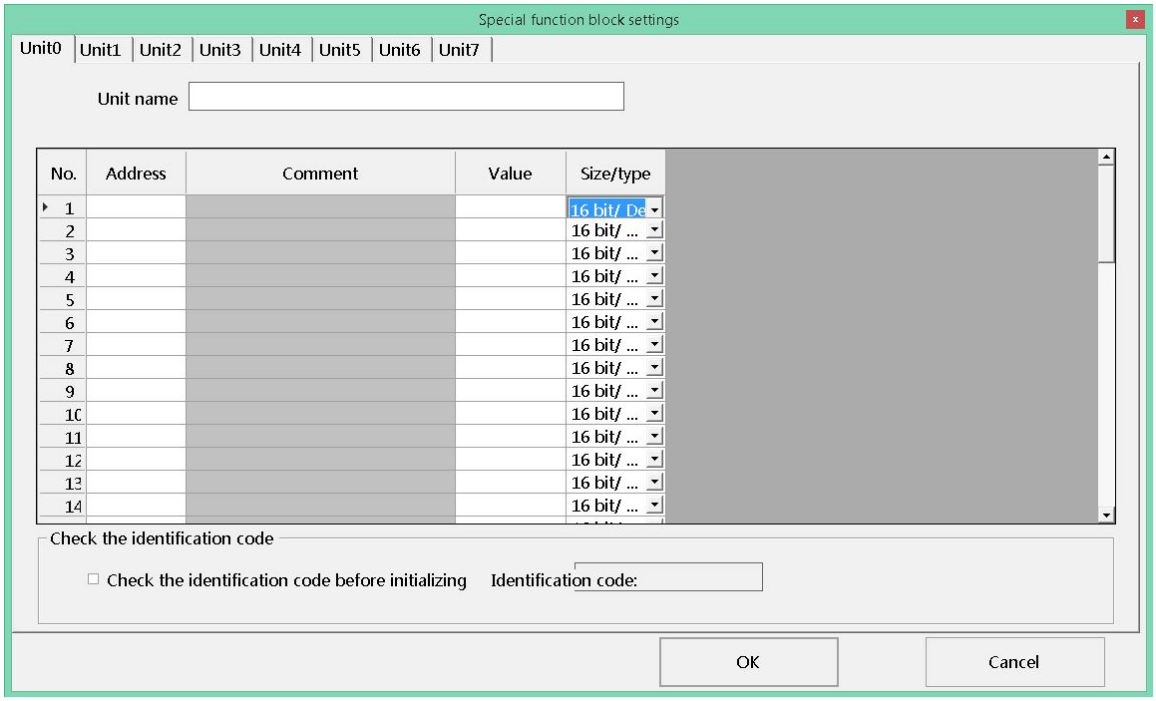


Special function block setting



Set item	Contents Of Setting	Setting range
Unit No.	This is the unit number of each special function block/unit.	-
Unit Name	Set the name of each special function block/unit whose initial values are to be set.	32 half-width characters (or 16 full-width characters)

Special function block setting 【Initial value setting】

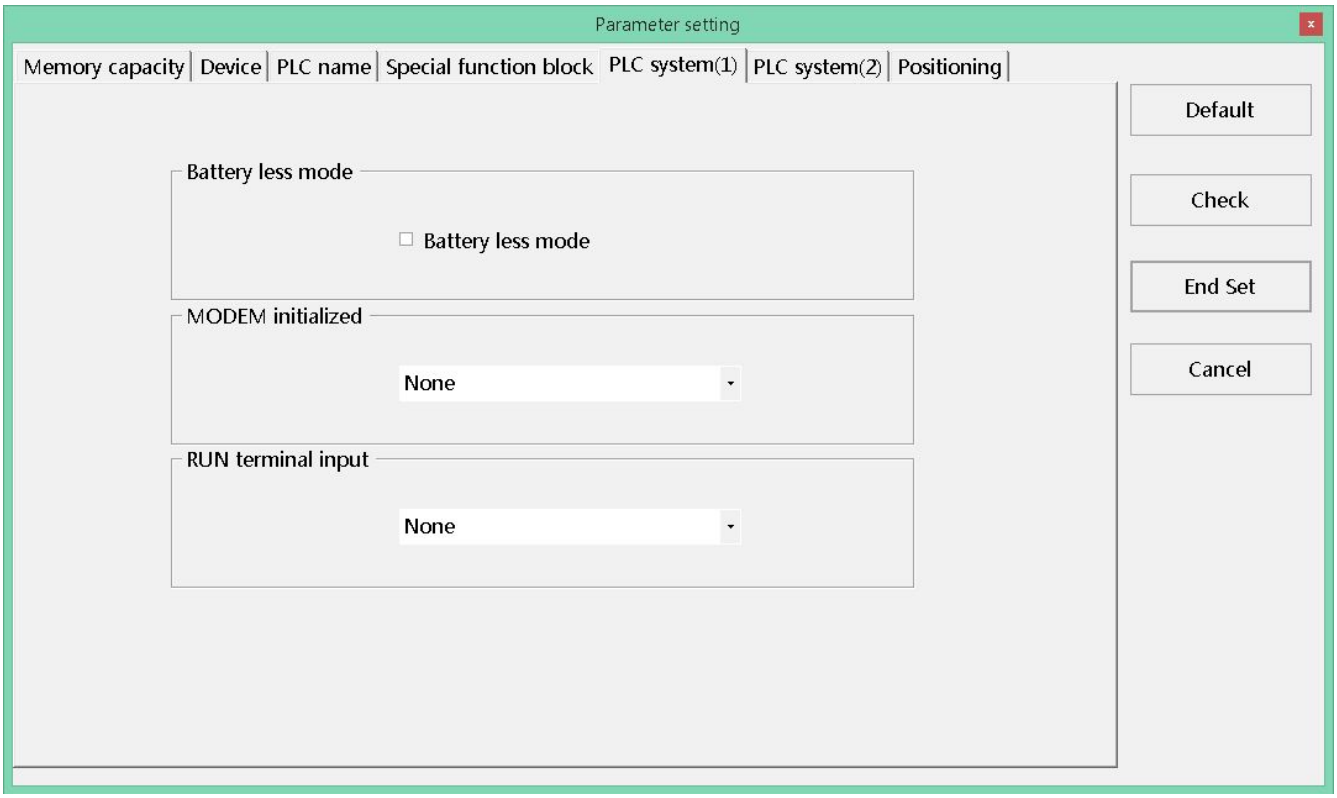


Set item	Contents Of Setting	Setting range
"Unit No." tab	Select the unit number of a special function block/unit to be set.	-
Unit Name	Set the name of a special function block/unit whose initial values are to be set. (The contents set on "I/O assignment" tab are displayed.)	32 half-width characters (or 16 full-width characters)
No.	This column indicates the order of initial value setting in the selected unit number. Numbers 1 to 98 can be set.	-
Address	Set the buffer memory address (BFM number) in a decimal value whose initial value is to be set.	*1
Comment	This column is displayed when device comments are registered. On the above screen, "Input mode of CH1 to CH4" is registered as the device comment for "U0\G0" (unit No. 0, BFM #0).	-
Value	Set a value to be set as the initial value of the buffer memory address (BFM number). Set the data length and type of the set value in "Size/Type" column.	*2
Size/Type	Select the size and type of a value set to the buffer memory among the following: 16bit/DEC 32bit/DEC 16bit/HEX 32bit/HEX	-
Check the identification code before initializing	Put a check mark to check the model code of the special function block/ unit before initialization.	-
Identification code	Set the model code of the special function block/unit.	-

*1. Input buffer memory addresses (BFM numbers) that in the connected special function block/unit hold.

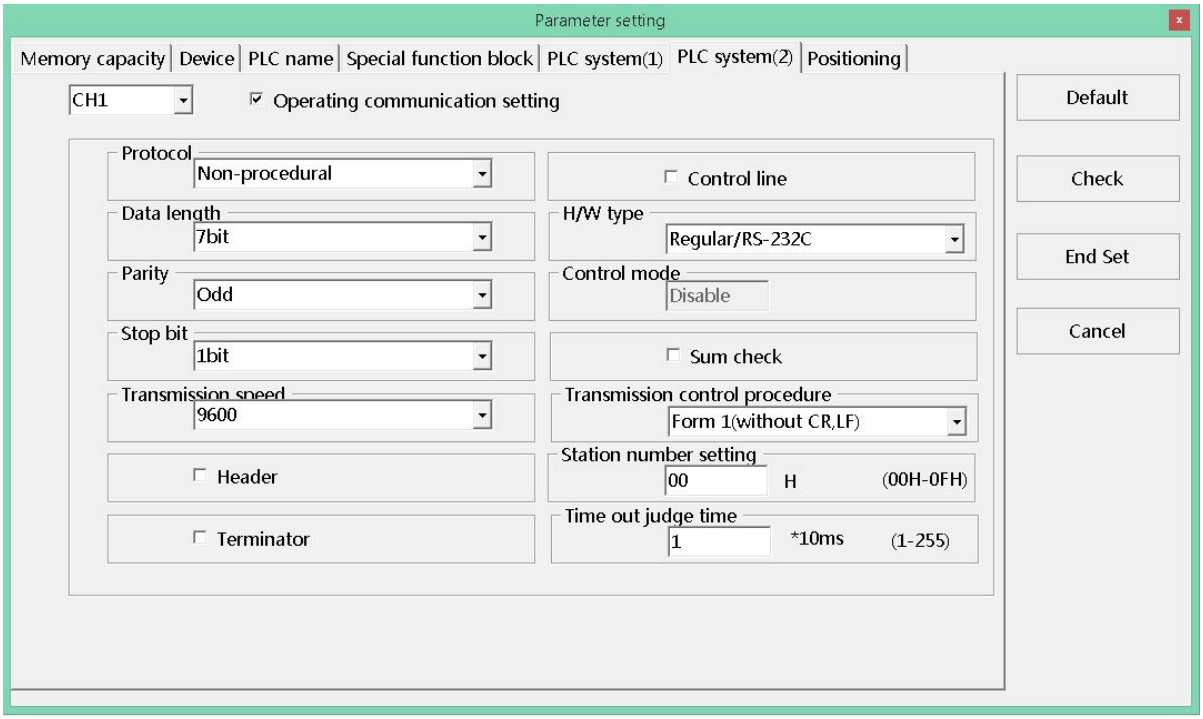
*2. To each buffer memory address (BFM number), set a value within the allowed range in the connected special function block/unit.

Setting the PLC system (1)



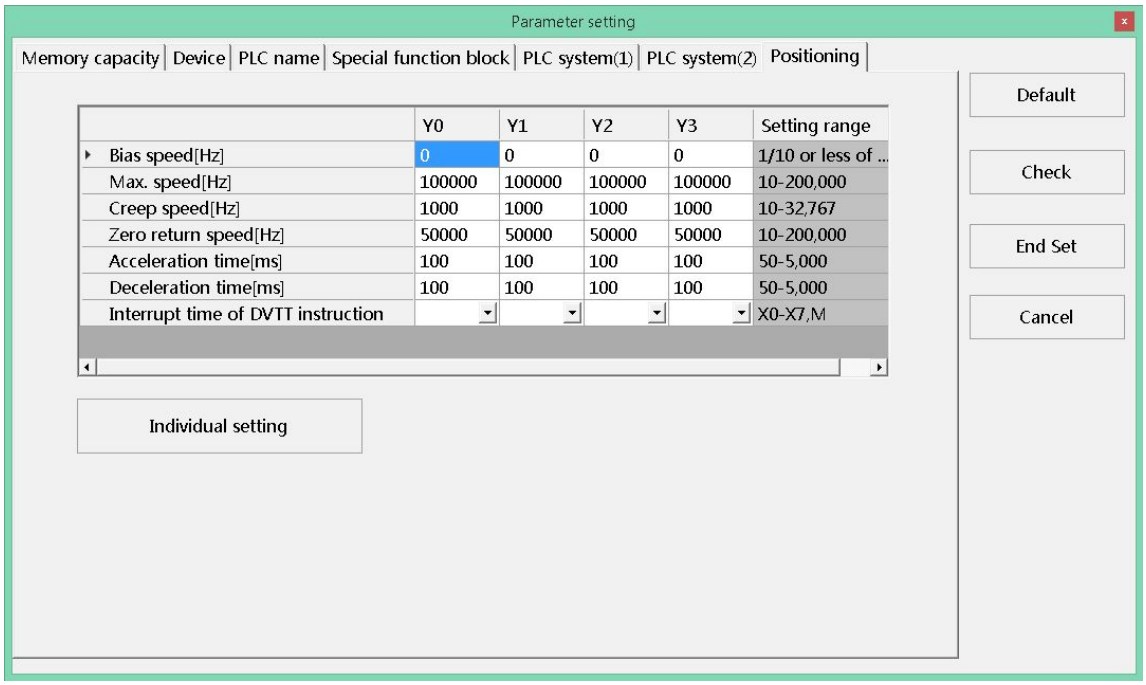
Set item	Contents Of Setting	Setting range
Battery less mode	Select this to operate the PLC without using the battery. When a check mark is put here, the battery error indicator lamp is automatically turned off and devices in the latched (battery backed) area are automatically cleared.	-
MODEM initialized	Set this item to automatically initialize a connected modem when the PLC power is turned ON.	-
RUN terminal input	Set this item to use an input terminal (X) to switch the PLC between STOP and RUN.	None X000 ~ X017*3

Setting the PLC system (2)



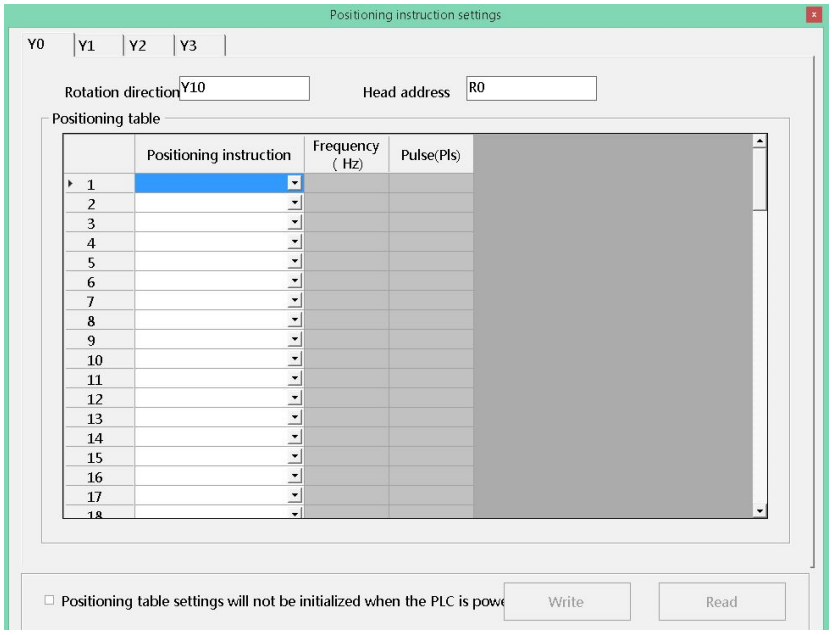
Set item	Contents Of Setting	Setting range
Channel selection	Select a channel in which a serial port is set.	CH1、CH2
Operate communication setting	Put a check mark when using the selected serial port in "computer link", "no-protocol communication" or "inverter communication". Do not put a check mark when transferring and monitoring sequence programs in HCP-Works or when using the selected serial port in simple N : N link or parallel link.	-
Protocol	Set each item in accordance with application.	
Data length		
Parity		
Stop bit		
Transmission speed		
Header		
Terminator		
Control line		
H/W type		
Control mode		
Sum check		
Transmission control procedure		
Station number setting		
Time out judge time		

Setting positioning



Set item	Contents Of Setting	Setting range
Bias speed [Hz]	Set the bias speed for each output number of pulse. Initial value: 0	1/10 or less of the maximum speed
Max. speed [Hz]	Set the maximum speed for each output number of pulse. Initial value: 100,000	-
Creep speed [Hz]	Set the creep speed in DSZR (FNC150) instruction for each output number of pulse. Initial value: 1000	10 ~ 32767*2
Zero return speed [Hz]	Set the zero point return speed in DSZR (FNC150) instruction for each output number of pulse. Initial value: 50000	-
Acceleration time [ms]	Set the acceleration time for each output number of pulse. Initial value: 100	50 ~ 5000
Deceleration time [ms]	Set the deceleration time for each output number of pulse. Initial value: 100	50 ~ 5000
Interruption input of DVIT instruction	Set the interrupt input*3 for DVIT (FNC151) instruction for each output number of pulse. Specify a user interrupt command device (M) for a pulse output destination device not used in DVIT instruction. Initial setting: Setting range: Pulse output destination Y000: X000 X000 to X007, M8460 Pulse output destination Y001: X001 X000 to X007, M8461 Pulse output destination Y002: X002 X000 to X007, M8462 Pulse output destination Y003: X003 X000 to X007, M8463	As shown on the left
Y0	They are set items for the pulse output destination Y000.	-
Y1	They are set items for the pulse output destination Y001.	-
Y2	They are set items for the pulse output destination Y002.	-
Y3	They are set items for the pulse output destination Y003.	-
Individual setting	This button displays "Positioning instruction settings" dialog box for setting the table used in TBL (FNC152) instruction.	-

Setting positioning [Individual setting]



Set item	Contents Of Setting	Setting range
Y0	Set the positioning table for the pulse output destination Y000.	-
Y1	Set the positioning table for the pulse output destination Y001.	-
Y2	Set the positioning table for the pulse output destination Y002.	-
Y3	Set the positioning table for the pulse output destination Y003.	-
Rotation direction signal	Set the relay number of the rotation direction output signal. Initial setting: Pulse output destination Y000: Y010 Pulse output destination Y001: Y011 Pulse output destination Y002: Y012 Pulse output destination Y003*2: Y013	Y0 - Y357 M0 - M7679 S0 - S4095
Head Address.	Set the head number of devices storing the set data (pulse number and frequency). 1600 devices (HCA8) are occupied starting from the head device number set here without regard to the number of axes. Initial setting: R0	D0 - D6400 R0 - R31168
No.	This column shows the table number. Numbers 1 to 100 can be set.	-
Positioning Instruction	Select the positioning type among the following: DDVIT (Interrupt positioning instruction)*3 DPLSV (Variable speed output pulse instruction) DDRVI (Relative positioning instruction) DDRVA (Absolute positioning instruction)	-
Pulse	Set the pulse number output by the operation (instruction) set in "Positioning Instruction" column.	-
Frequency [Hz]	Set the speed (pulse frequency) output by the operation (instruction) set in "Positioning Instruction" column.	-

Chapter 7 Find and Replace

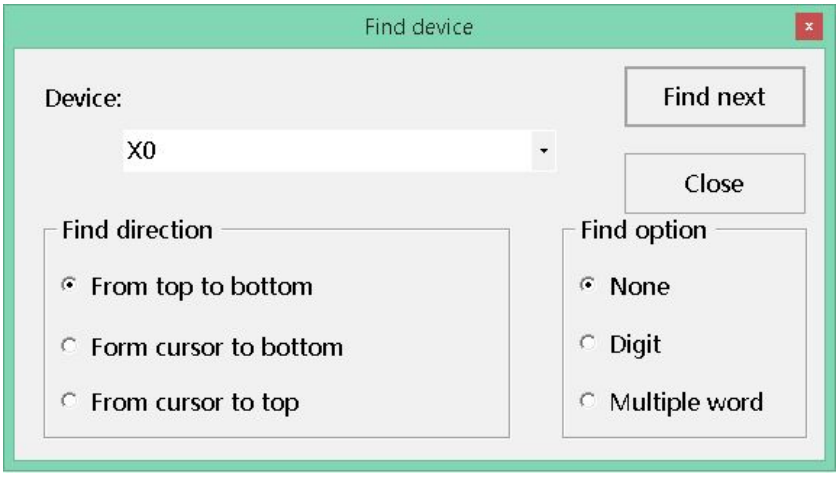
This section explains the method for finding and replacing the specified device, comment and instruction.

7.1 Finding a Device

Searches for a device in the program.

【Operating procedure】

【Find/ Replace】 ⇨ 【Find device】or click  .



【Description】

Find device

Designates a device to be searched.

For label programming.

When a device search is made in the ladder/list mode, only the completely matching character string of the device is searched for.

Find direction

Sets a search direction.

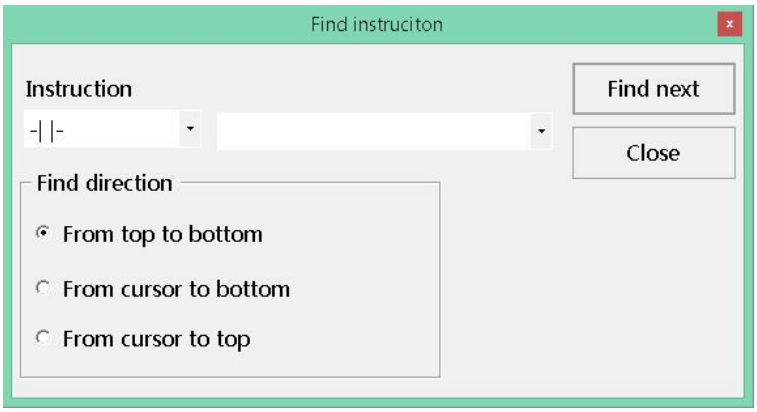
- Find from top to bottom
  Searching takes place from step 0 to the END instruction.
- Find from cursor bottom
  Searching takes place from the cursor position to the END instruction.
- Find from cursor to top
  Searching takes place from the cursor position to step 0.

7.2 Finding an Instruction

Searches for an instruction in the program

【Operating procedure】

【Find/ Replace】⇨【Find instruction】or click  .



【Description】

Instruction

Designates an instruction symbol and an instruction name for search.

The following lists the symbols that can be designated:

The following table shows instruction search examples:

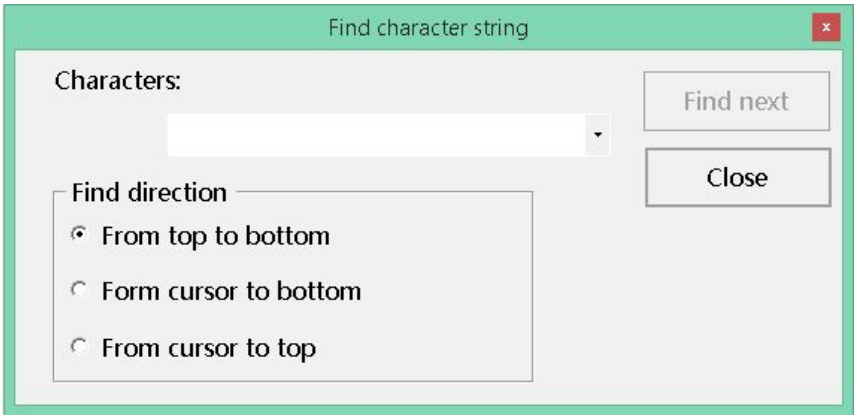
Instruction specification	Search instruction	Search example
MOV	MOV(P)	MOV、 MOVP
MOVP	MOVP	MOVP
MOV D0 K4Y0	MOV(P)D0(Z**) K4Y0(Z**)	MOV D0 K4Y0、 MOVP D0Z1 K4Y0、 MOV D0 K4Y0Z1、 MOVP D0Z1 K4Y0Z1
MOVP D0 U0\G0	MOVP D0(Z**) U1(Z**)\G0(Z**)	MOVP D0 U1\G0、 MOVP D0Z1 U1\G0、 MOVP D0 U1Z1\G0Z1、MOVP D0Z1 U1Z1\G0Z1

7.3 Finding a Character String

Searches for a character string in the edit window for programs, device comments, or device memories.

【Operating procedure】

Select【Find/ Replace】⇨【Find character string】.



【Description】

Find character string

Designates the character string to be searched for.

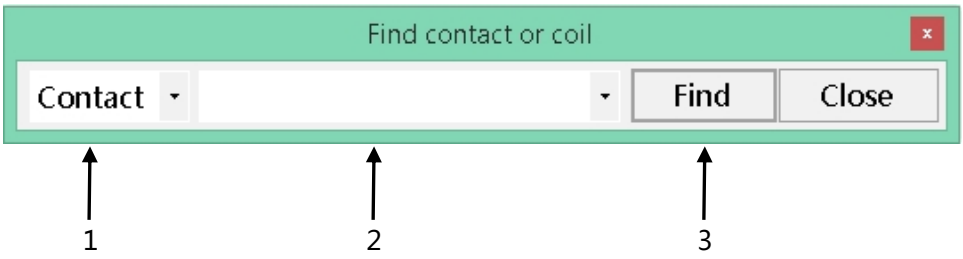
Enter a character string to be searched for in up to 64 characters.

7.4 Finding a Contact/Coil

Search for a contact or coil corresponding to the device at the cursor position.

【Operating procedure】

Select【Find/Replace】⇨【Find contact or coil】



【Description】

1 Contact or coil select

Choose the contact or coil.

2 Device text box

Set the device you want to search for.

3 "Find" button

Click this button to search for the specified device.

A search starts from the beginning of the program.

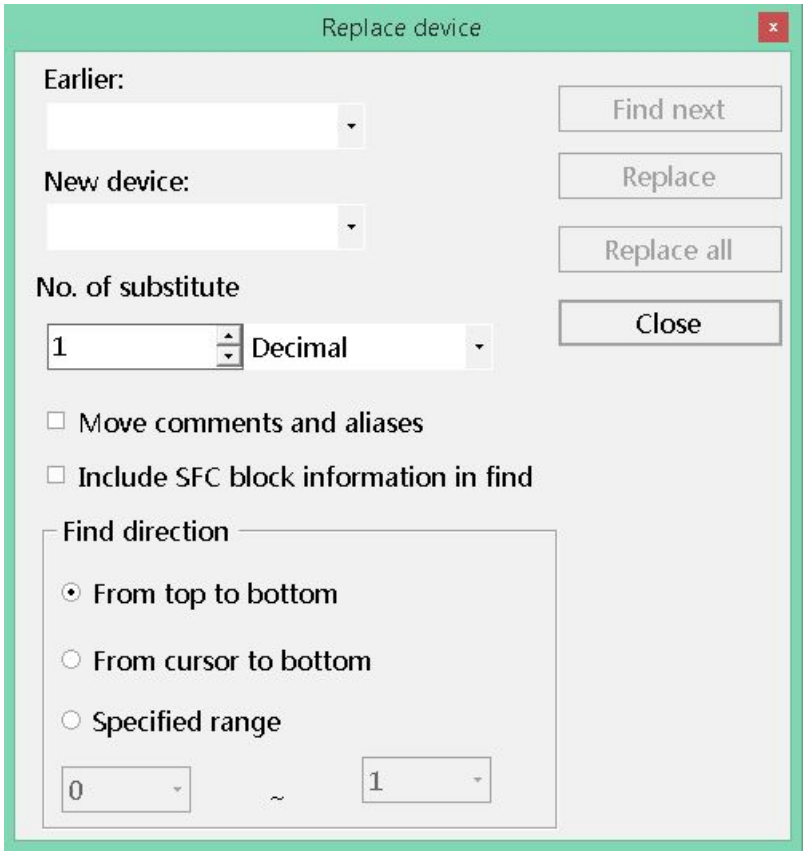
If there are two or more programs, the other programs will be searched.

7.5 Replacing a Device

Replaces a device or character string constant in the program currently being edited.

【Operating procedure】

Select【Find/ Replace】⇨【Replace device】.



【Description】

Earlier device

Designates a device or character string constant (before change) to be replaced.

New device

Designates a device or character string constant (after change) for replacement.

No. of substitute

Designates the number of devices to be replaced among the devices designated by earlier device setting.

Alternatively, you can specify the substitute count in decimal or hexadecimal.

For label programming

When specifying by label, limit the number of replacement points to 1.

Move comments

Designates whether to move the comments and Alias attached to a device together.

POINTS

- Device specification

  The following lists the devices that can be replaced:

  ▪Word device→Word device

  ▪Bit device→Bit device

  Though an extended specification can be given, digit, index, and indirect modifications cannot be made.

  The table below lists the extended specification and word/bit device replacement examples:

X0 → U1\G0 . . . . . Replaceable	X0 → D0 . . . . . Not replaceable
D0 → U10\G0 . . . . . Replaceable	X0 → K4X0 . . . . . Not replaceable
X0 → D0. 5 . . . . . Replaceable	D0 → D0. 5 . . . . . Not replaceable
D0. 1→ D1.1 . . . . . Replaceable	

- When a replacement range is given, it is effective only for open programs at present and searching for the other programs takes place from the beginning.

- Restrictions on HCFA A series

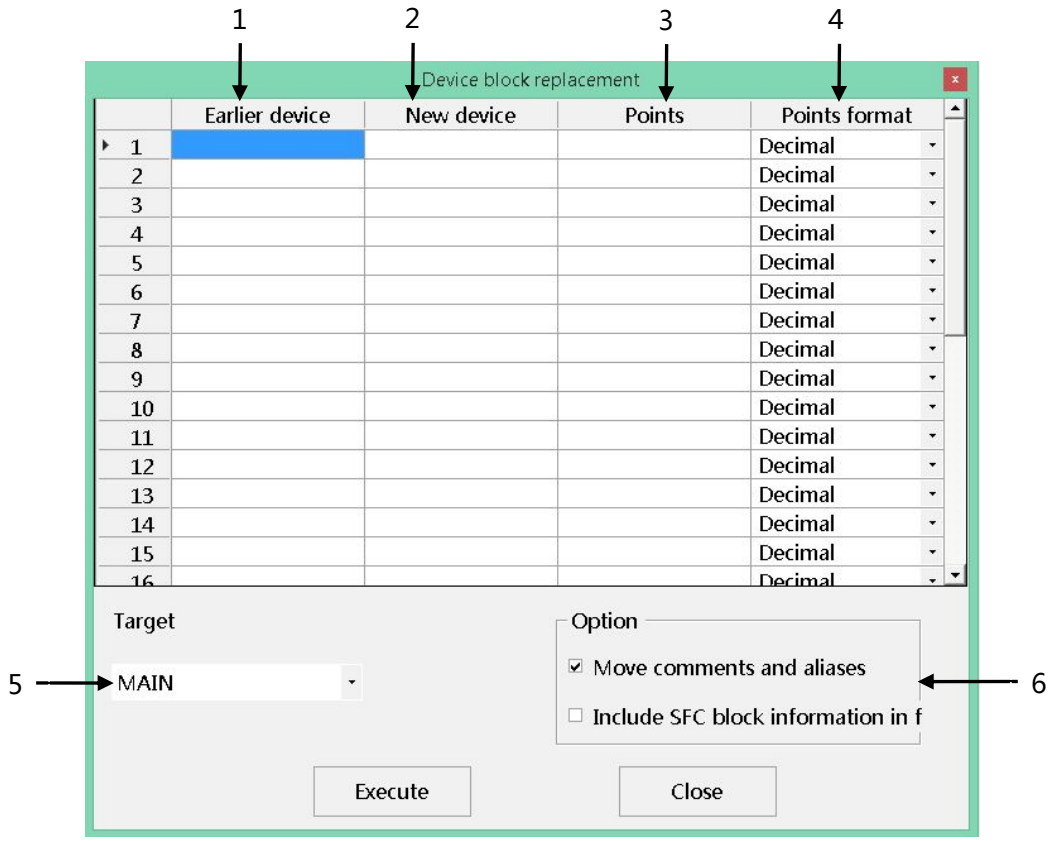
  Device replacement cannot take place between the 16-bit counters and 32-bit counters.

7.6 Replacing a Batch of Devices

Set multiple devices and replace all of them at once.

【Operating procedure】

Select【Find/ Replace】 ⇨ 【Device block replacement】.



【Description】

1 Earlier device

Specify the device or character string constant or label to be searched for.

2 New device

Specify the replacement device or character string constant or label.

3 Points

Set how many points will be replaced starting from the one specified as "Earlier device".

The points must be specified in decimal or hexadecimal.

4 Points format

Select decimal or hexadecimal format.

5 Target Program

Select the target program for replacement.

6 Option

Move comments and aliases

Set whether the comments and device names will be moved together with the corresponding device.

Include SFC block information in find targets

Set whether the devices used in block information of each block will also be the target for replacement.

POINTS

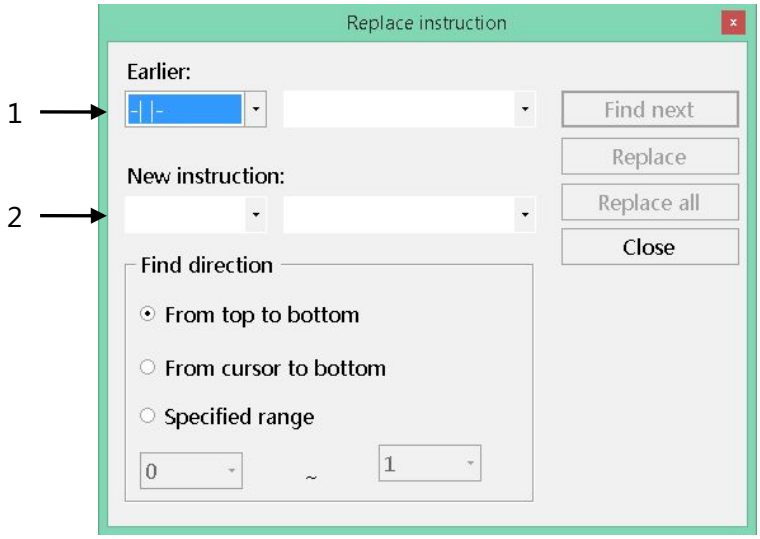
- Up to 32 device block replacement settings can be made.
- When the label set in earlier or new device is not defined, an error occurs in compiling of the target label program.

7.7 Replacing an Instruction

Replaces an instruction in the program currently being edited.

【Operating procedure】

Select【Find/ Replace】⇨【Replace instruction】.



【Description】

1 Earlier instruction

Designates an instruction (before change) to be replaced.

2 New instruction

Designates an instruction (after change) for replacement.

POINTS

1. An instruction plus device can be designated for instruction input. Only the ladder symbol can also be designated.
2. The replaced instruction is not executed unless it is logical.
3. The number of steps changes for instruction replacement.

■ For the replacement of a 16 bit (word) handling instruction by a 32 bit (double word) handling instruction in instruction replacement, if a constant has been specified for the device, it will be changed as follows.

Negative constant of K (example: K-1)→Sign extension is made (K-1)

For H, constant whose bit corresponding to the sign is ON (example: HFFFF)→ sign extension is not made and the constant is converted as it is (H0000FFFF)

Example) : MOV K-1 D0 (MOV replaced by DMOV) DMOV K-1 D0

MOV K-200 D0 (MOV replaced by DMOV) DMOV K-200 D0

MOV HFFFF D0 (MOV replaced by DMOV) DMOV H0000FFFF D0

For the replacement of a 32 bit handling instruction by a 16 bit handling instruction, the upper 16 bits are discarded.

Example) : DMOV K-1 D0 (DMOV replaced by MOV) MOV K-1 D0

DMOV K150000 D0 (DMOV replaced by MOV) MOV K18928 D0

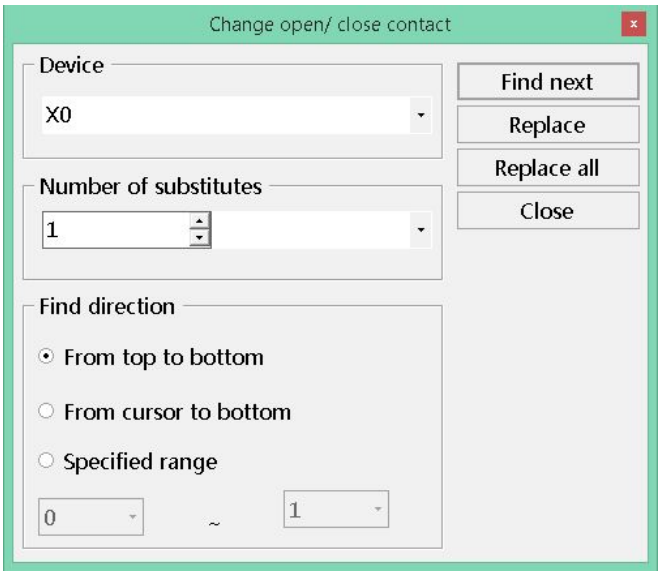
DMOV HFFFFFFFF D0 (DMOV replaced by MOV) MOV HFFFF D0

7.8 Changing Open/Close Contacts

Changing the contacts (open contact/close contact) of the program currently being edited

【Operating procedure】

Select【Find/Replace】⇨【Change open/ close contact】.



【Description】

Device

Designates a device for which contacts A and B are to be switched.

Number of substitutes

Designates the number of consecutive devices (including a designated device) for which contacts A and B are to be switched.

POINTS

- Device specification

  Extended specifications and bit No. modifications are valid for device specification, but index modifications are not valid

- Device specification example

  X0, J1\B6, D0. 5, U10\G0. 3 → Can be specified.

  X0Z3 → Cannot be specified.

  (index modification is not possible.)

- The open contact and close contact of the following instructions can be switched.

  Open contact : LD、AND、OR、LDP、ANDP、ORP、EGP

  Close contact: LDI、ANI、ORI、LDF、ANDF、ORF、EGF

- For a ladder, a statement or note is the target of search.

7.9 Replacing a Character String

Replaces the character string on each edit window for programs, device comments, or device memories.

【Operating procedure】

Select【Find/ Replace】⇨【Replace character string】

【Description】

Earlier character string

Designates the character string (before change) to be replaced.

Enter a character string to be replaced (statement before change) in up to 64 characters.

New character string

Enter a character string for replacement (statement after change).

POINTS

- Search with "Find Next" button

  Searches a device designated by earlier character string.

- Search with "Replace" button

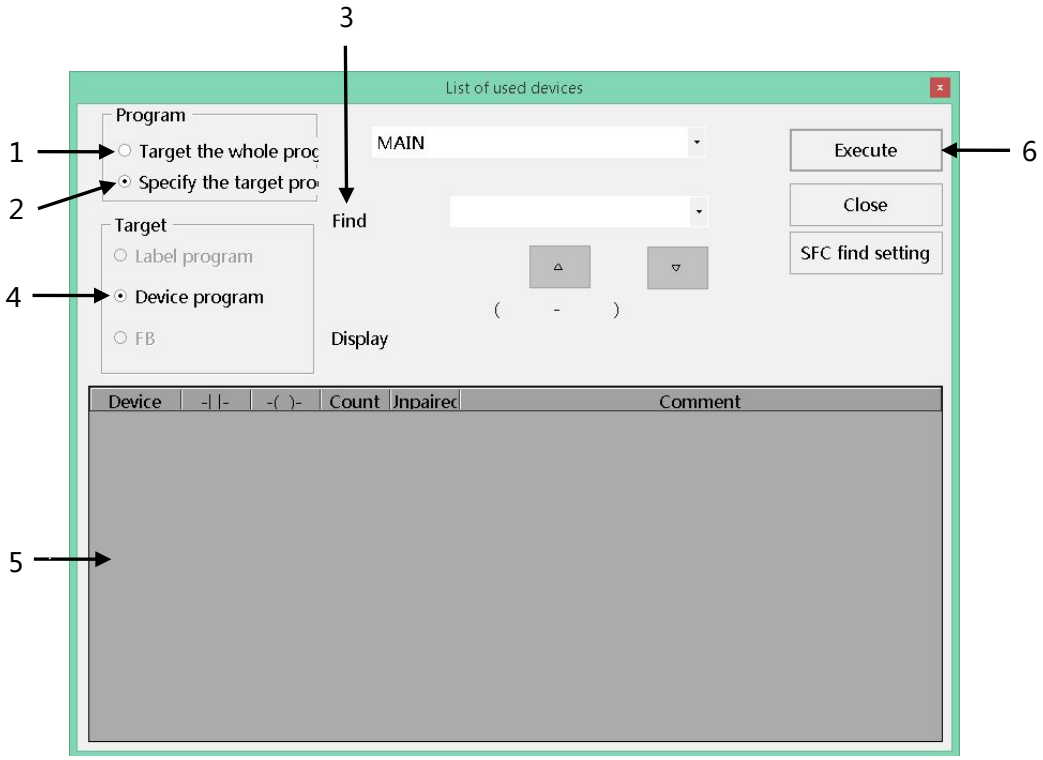
  Replaces for each device.

7.10 List of Used Devices

Lists the device use conditions in a program on a specified device basis.

【Operating procedure】

Select【Find/Replace】⇨【List of used device】



【Description】

1 Target the whole program

Click the radio button to display a device-use list for all programs in the project.

2 Specify the target program

Designates a program to be searched.

ST is not selectable.

3 Find device

Designates the first device to be searched for.

Click △▽ button moves the screen up or down by 512 points.

(Clicking the scroll bar moves the screen by 512 points.)

In a single search, 512 points shown in the display area are searched.

When the cursor is on the device list, you can scroll the screen using [Ctrl] + [PageUp] / [PageDown].

4 Target (only during label programming)

Select label program or actual device.

5 Device-use Instruction list

Items	Description
Device	Instruction lists devices in such a way that the device designated in the search device is listed first.
-||-	Displays" *" when the device has been used in the source of the instruction.
-( )-	Displays" *" when the device has been used in the destination of the instruction.
Count	Indicates the frequency of coil usage.
Error	Displays "ERR" when the device has been used only in the source or the destination.
Comment	Displays a comment attached to the device. Clicking the scroll bar moves the screen by 512 points.

6 【Execute】 button

Click this button after designating a search program or a search device.

A device-use list contains the instructions used and their frequency in such a way that the device designated in the search device comes first.

POINTS

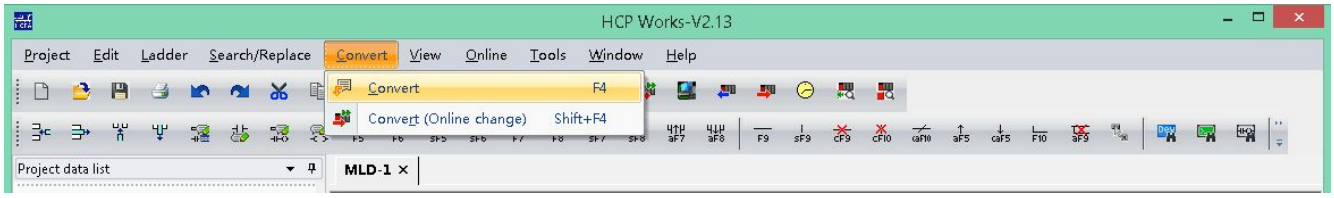
- When ZR is designated, 8,192 devices (including the designated device as the first one) are searched.
  To display out-of-range devices, the devices must be designated again.
  Page scroll takes place within 8,192 devices listed.
- When two or more windows are open, the result of comment editing on the deice use list screen is reflected on other windows as soon as the window is switched to another.
- If there is an unconverted ladder, the device use list function can be used.
- For label program creation, this function does not support label devices. Make an "N/O"/"N/C" contact change after searching for a label device in the contact/coil use list.

7.11 Converting a Ladder Program

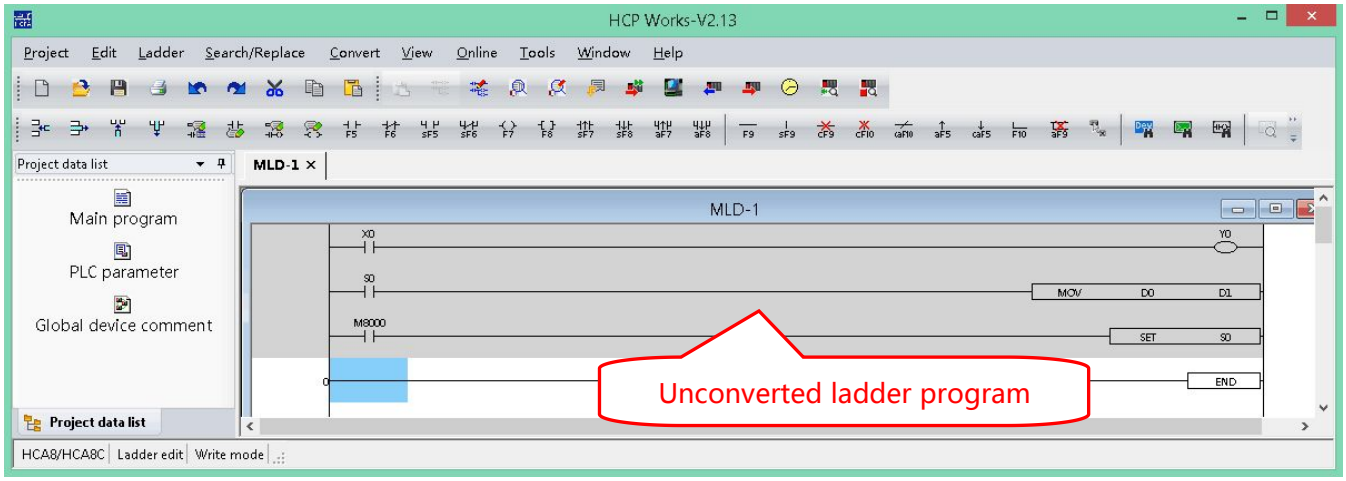
This chapter describes normal conversion and batch program conversion.

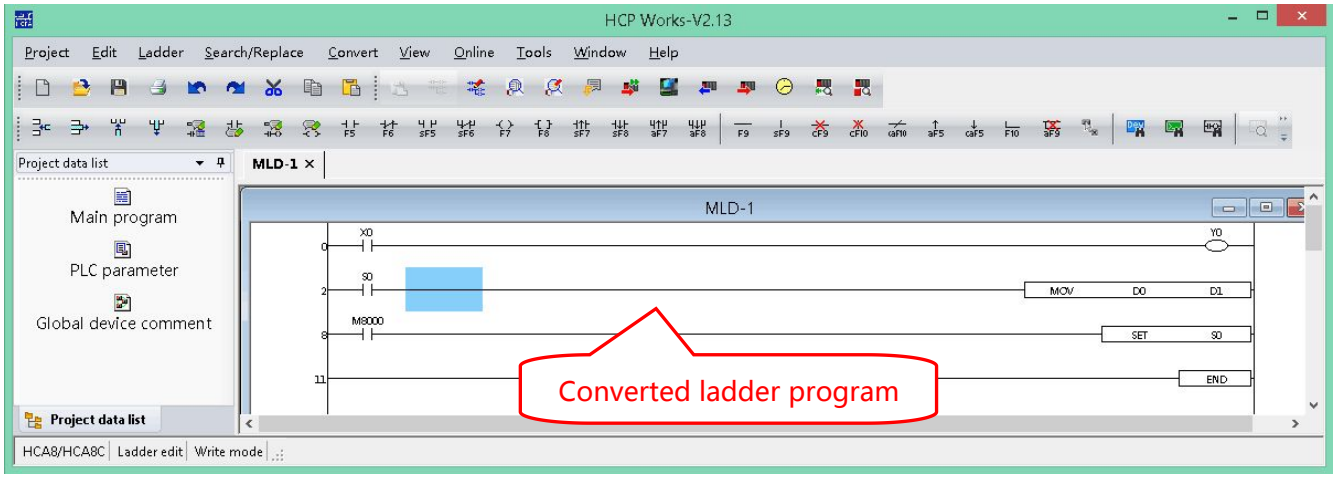
【Operating procedure】

【Convert/Compile】⇒【Convert +Compile】.



The edited and modified ladder program will be shown in grey. This kind of ladder program cannot be saved and written to PLC. Please convert and compile the ladder program .





Chapter 8 Reading from/Writing to PLC

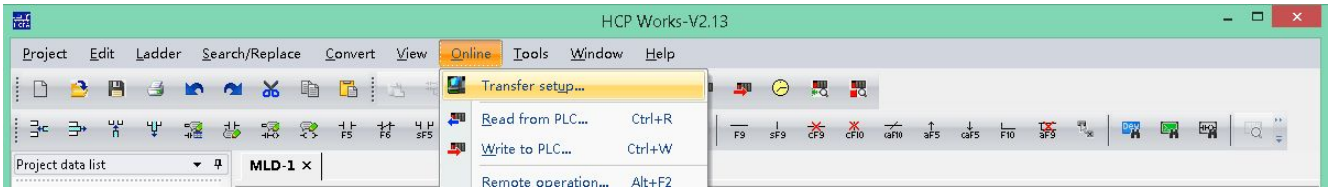
This chapter explains the access to the PLC, reading data from/writing data to PLC.

8.1 Transfer Setup

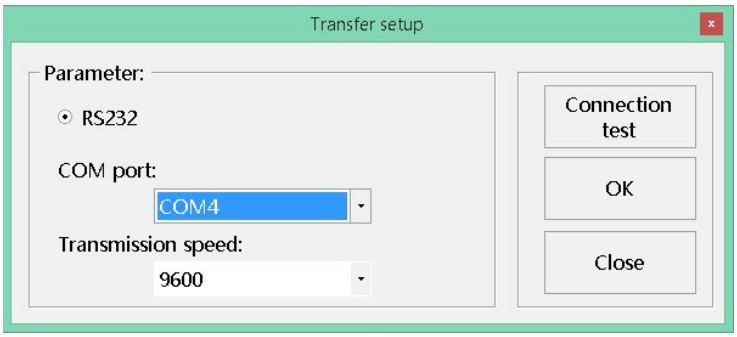
Specify the connection target when accessing the host station via serial port or USB.

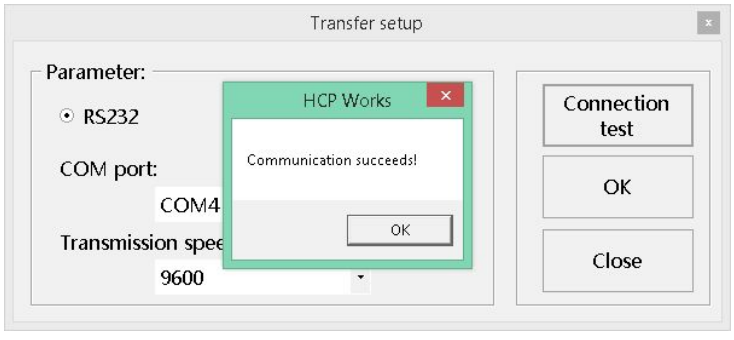
【Operating procedure】

Select【Online】⇨【Transfer setup】to open the dialog box of “transfer setup”.



Select【Serial port】to open the dialog box.



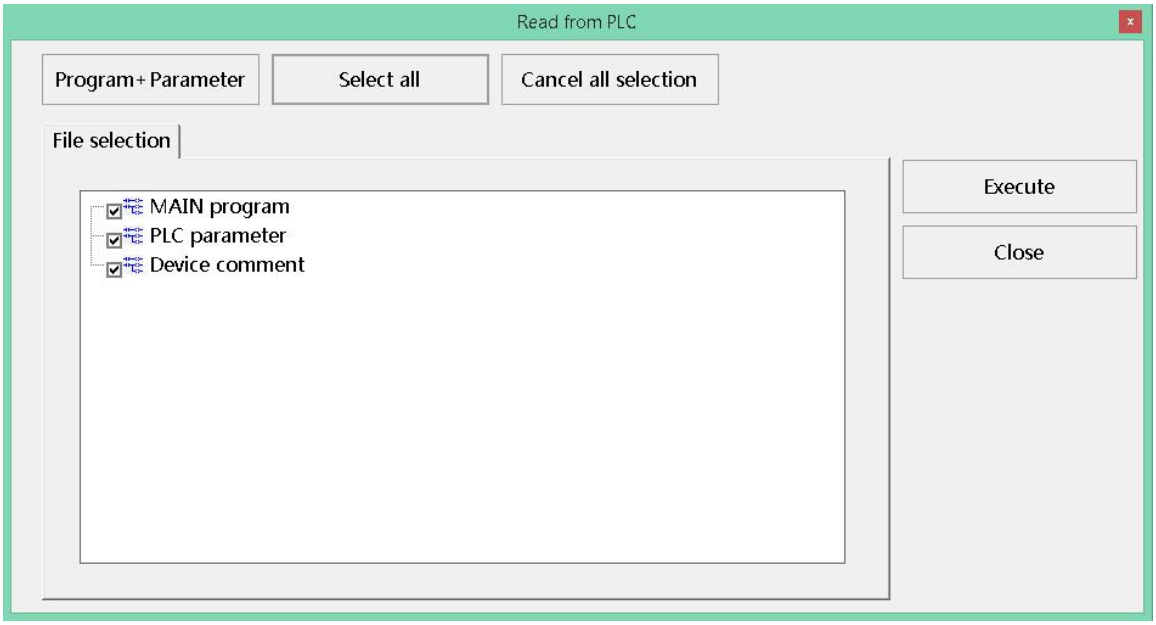


8.2 Reading from PLC

Reading the ladder program, parameters and device comment from PLC

【Operating procedure】

1 . Select【Online】⇨ 【Read from PLC】to open the dialog box as follows.



2 . Select【Execute】.

8.3 Writing to PLC (Writing during RUN)

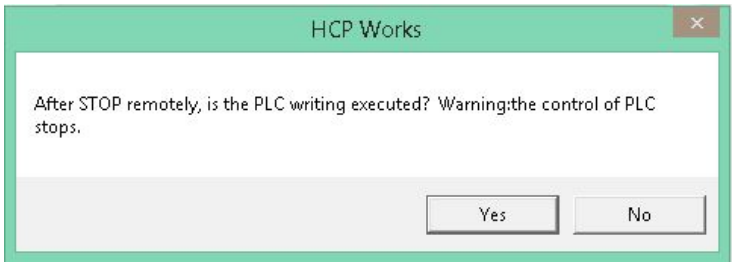
Writing ladder program, parameter and device comment to PLC

【Operating procedure】

1 . Select【Online】⇨【Write to PLC】to open the dialog box as follows .

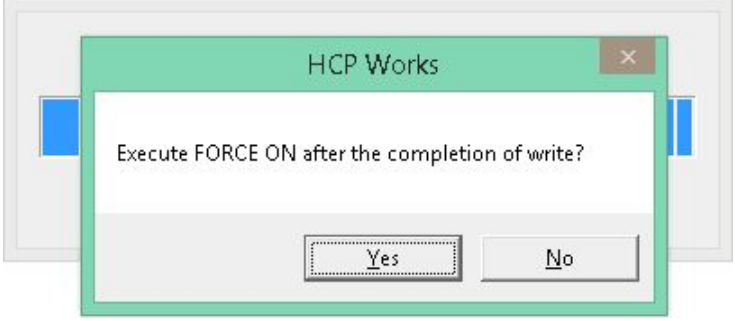
2 . Select【Execute】

When the PLC state is during RUN, it cannot be written. The following dialog box will pop up to confirm whether to execute STOP. If select 【Yes】, continue to write to PLC. If select 【No】, stop writing .



3 . After writing, set the PLC operation status.

Select【Yes】: PLC state is RUN ; select【No】: PLC state is STOP .



8.4 Precautions for Writing Rise and Fall Instruction during RUN

Rise instruction

When the online change of the ladder including the rise instruction is completed, the written rise instruction is executed if its target device or operation condition device is ON.

Target rise instruction ..... LDP, ANDP, ORP, pulse execution type application instruction (e.g. MOVP).

When online change is performed to the ladder block that includes rise detection instruction (LDF instruction/ANDF instruction/ORF instruction)	
The target device is ON.	The target device is OFF.
The contacts of LDF, ANDF and ORF instruction included in the ladder block turn ON for 1 scan.	The contacts of LDF, ANDF and ORF instruction included in the ladder block keep OFF status.

When online change is performed to the ladder block that includes pulse execution type application instruction (e.g. MOVP)	
The operation condition is ON.	The operation condition is OFF.
The relevant pulse execution type application instruction included in the ladder block operates for 1 scan.	The relevant pulse execution type application instruction included in the ladder block does not operate

When online change is performed to the ladder block that includes PLS instruction	
The operation condition is ON.	The operation condition is OFF.
When PLF instruction is included in a ladder block, the target device for the instruction does not operate. Operates when the operation condition changes from ON to OFF before and after online change.	

Fall instruction

When the online change of the ladder including the fall instruction (LDF instruction/ANDF instruction/ORF instruction) is completed, the written fall instruction is not executed if its target device is ON or OFF

The fall instruction (PLF instruction) is not executed, either, if its operation condition device is ON or OFF.

To execute the fall instruction, turn the target device or operation condition device from ON to OFF again.

When online change is performed to the ladder block that includes fall detection instruction (LDF instruction/ANDF instruction/ORF instruction)	
The target device is ON.	The target device is OFF.
The contacts of LDF, ANDF, and ORF instruction included in the ladder block keep OFF status.	

When online change is performed to the ladder block that includes PLF instruction	
The operation condition is ON.	The operation condition is OFF.
When PLF instruction is included in a ladder block, the target device for the instruction does not operate. Operates when the operation condition changes from ON to OFF before and after online change.	

Convert the operation result to raising pulse

If the operation result to convert the operation result to raising pulse instruction is on after writing a ladder including convert operation results to falling pulse instruction (MEP instruction) in RUN, the instruction execution result turns out to be ON.

When online change is performed to the ladder block including MEP instruction	
The operation result to MEP instruction is ON.	The operation result to MEP instruction is OFF.
The execution result turns out to be ON.	The execution result turns out to be OFF.

Convert operation result to falling pulse instruction

When writing a ladder including convert operation result to falling pulse instruction (MEF instruction) in RUN, the instruction is not executed whether its execution condition is established or not.

To execute the convert operation result to falling pulse instruction, turn on the operation result to the instruction once and then turn it off.

When online change is performed to the ladder block including MEF instruction	
The execution condition is established.	The execution condition is not established.
The execution result turns out to be OFF.	

8.5 Precautions for Writing during RUN

Items	Description
CPU which can make online change	HCA1/LX1S/DDUP series Built-in EEPROM、optional memory cassette(protect switch OFF)
	HCA2/LX1N series Built-in EEPROM、 optional memory cassette (protect switch OFF)
	HCA8/HCA8C series Built-in RAM、 option FLASH cassette (protect switch OFF)
Use of HCA1/LX1S/DDUP、HCA2/LX1N	• Corrected ladders do not have additions, deletions and changes to labels P, I.
	• Change cannot be made if any ladder before or after corrections includes the output (OUT) instruction of high-speed counter C235 to 255 or the application instruction (MNET, ANRD, ANWR, RMST, RMWR, BLK, MCDE).
	• There should be no new 1ms retentive timers inserted.
	• If the number of program steps is decreased due to delete of contact, coil or application instruction, write NOP by the number of the decreased steps.
Use of HCA8/HCA8C	• Corrected ladders do not have additions, deletions and changes to labels P, I.
	• Change cannot be made if any ladder before or after corrections includes the output (OUT) instruction of high-speed counter C235 to 255 or the application instruction SORT2, TBL and RBFM, WBFM.
	• There should be no new 1ms retentive timers inserted.
	• If the number of program steps is decreased due to delete of contact, coil or application instruction, the step numbers in the program after the one changed online decrease by the number of the decreased steps
	• Do not perform the online change (write during RUN) during the pulse output (during the instruction driving) with the positioning instruction of DSZR, DVIT , ZRN, PLSV, DRVI, DRVA. When the ladder during the pulse output is performed the online change, the pulse output is stopped. FPLSV [without acceleration/deceleration operation] is instantly stopped. DSZR, DVIT, PLSV [with acceleration/deceleration operation], DRVI or DRVA is decelerated to stop. When the instruction is stopped by the online change, turn off the instruction driving once and then, turn on it.
	• Do not perform the online change (write during RUN) during communication (during the instruction driving) in the inverter communication instruction of IVCK, IVDR, IVRD, IVWR, IVBWR. When performing the online change during the inverter communication, the communication may be stopped. When the communication is stopped, change the programmable controller from STOP to RUN.

8.6 Action to be Taken When Normal Online Change is not Executed

The following message may be displayed during online change (RUN write processing) because of timeout of the check time. In this case, observe the message instructions.

1 . "Verify with PLC and confirm the matching of the program." When this message is displayed, the program on the HCP - Works side may not be converted while the program on the programmable controller side has converted.In this case, convert the program on the HCP - Works side and then check the consistency with the programmable controller side. When inconsistency is found, load the program into the programmable controller by executing PLC downloading to When inconsistency is found, load the program into the programmable controller by executing PLC downloading to make both programs consistent.

Chapter 9 Monitoring and Debugging Programs

This chapter describes the monitoring of the operation processing of the programmable controller

9.1 Starting/Stopping Monitoring

Monitoring the ON/OFF states of contacts and coils

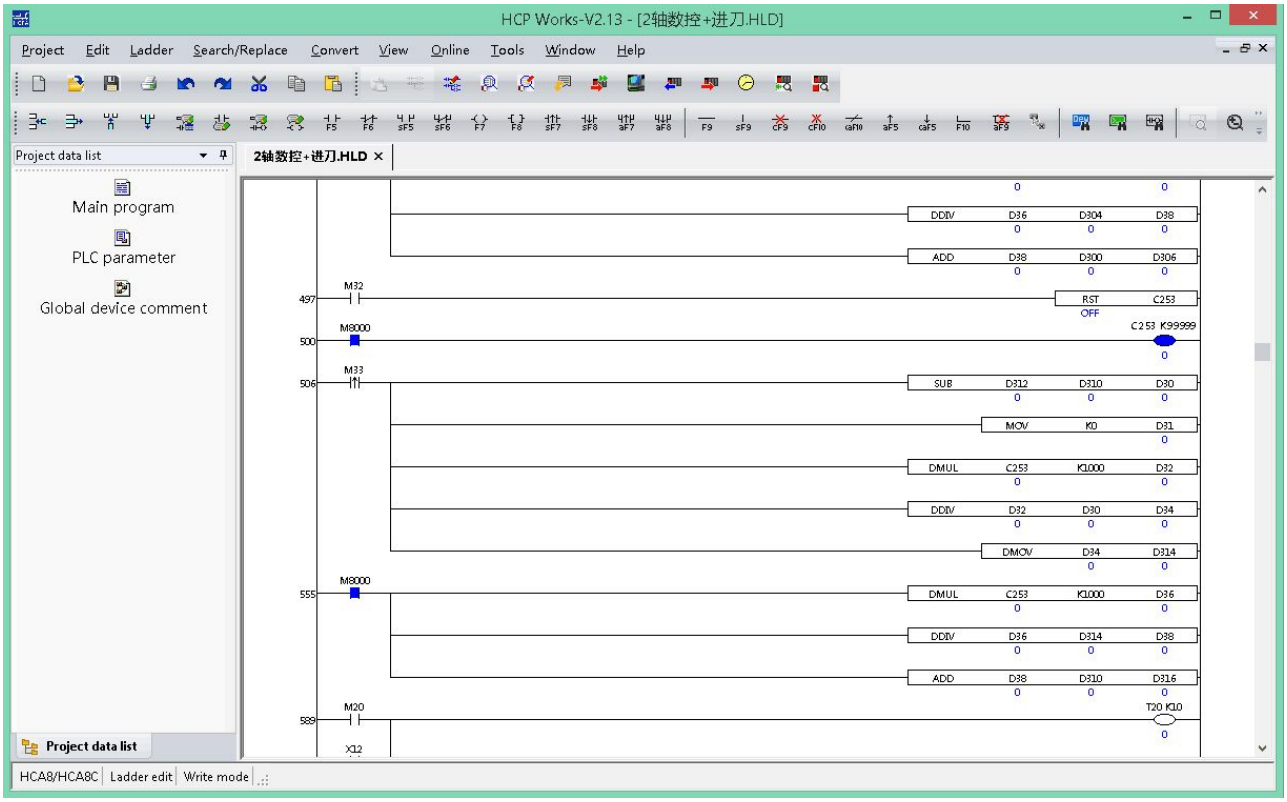
【Start monitoring】

Select【Online】⇨【Monitor】⇨【Start monitor】 or click  , (F3)

【Stop monitoring】

Select【Online】⇨【Monitor】⇨【Stop monitor】 or click  , (Alt + F3)

【Ladder monitoring】



【Description】

Ladder monitoring： During monitoring, the ON/OFF states of contacts and coils and the present values of devices are displayed, and they change in accordance with the operating state of the programmable controller.

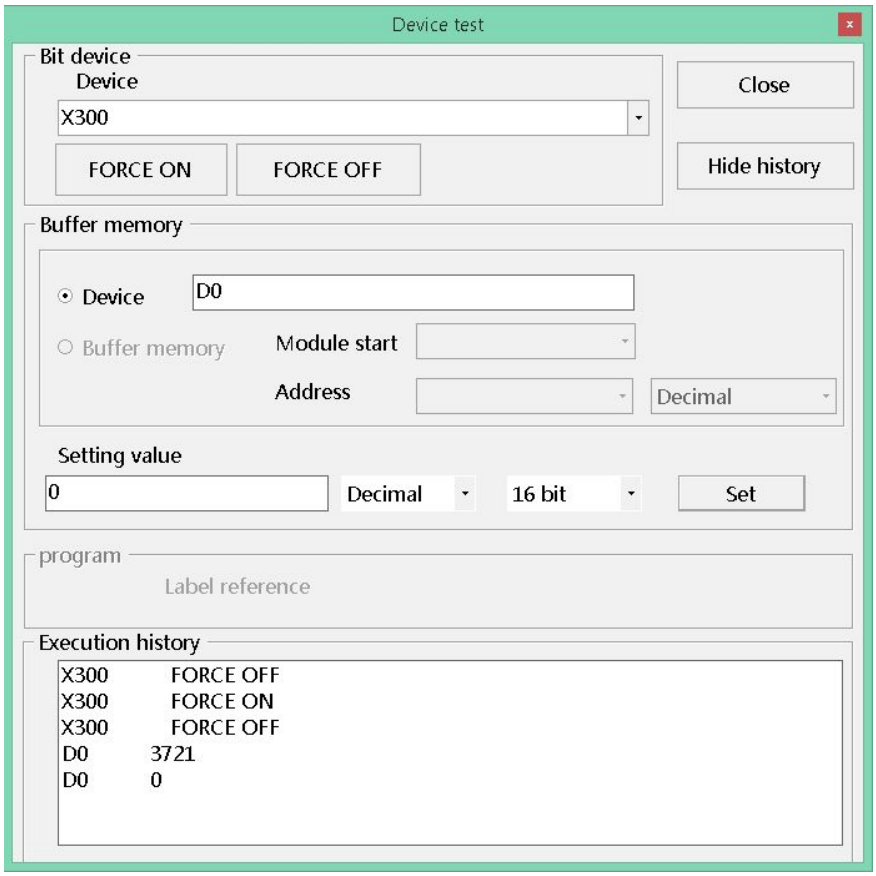
Present value motoring： Displays the present values of word devices. The present values can be switched between decimal and hexadecimal.

9.2 Conducting a Device Test

Forcibly turns ON/OFF the bit devices of the programmable controller, and changes the present values of word devices.

【Operating procedure】

Select【Online】⇨【Monitor】⇨【Device test】 or click  , (Ctrl + B)



【Description】

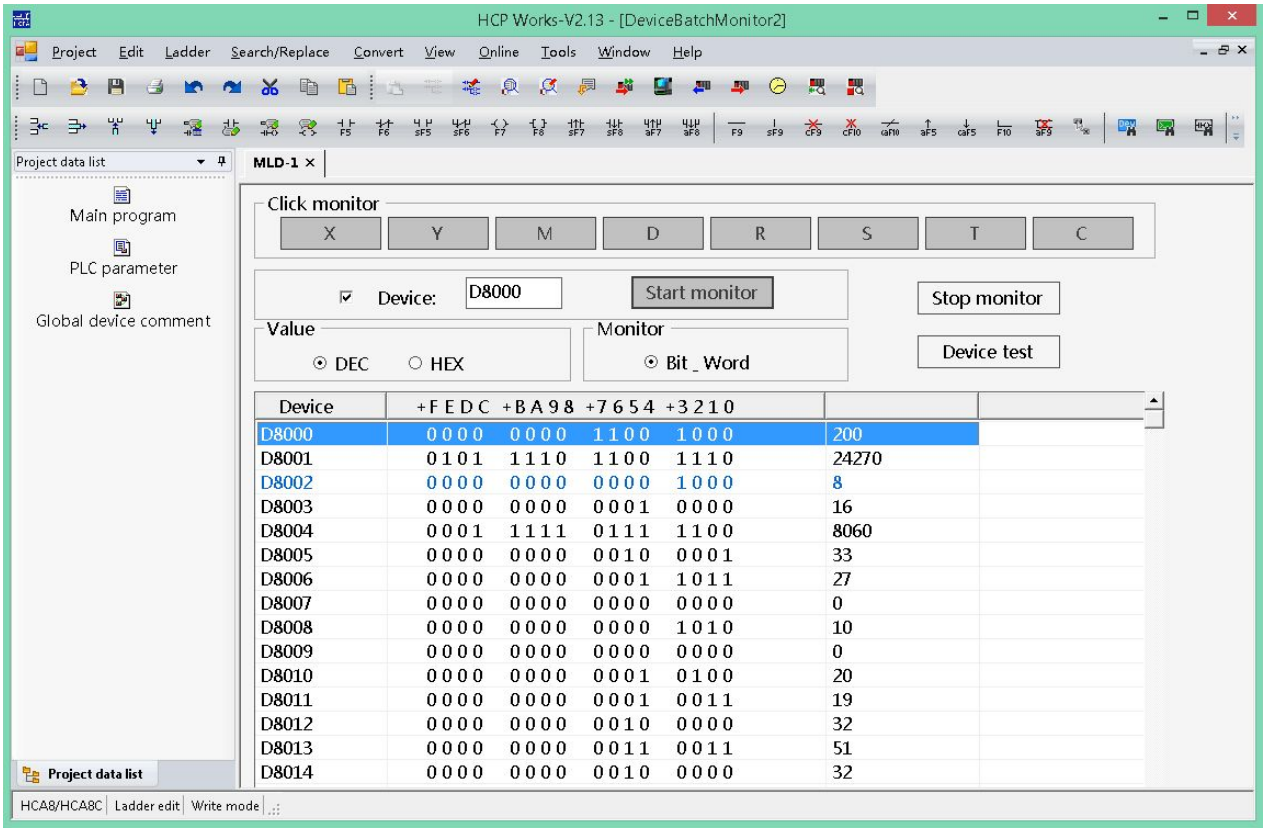
Bit device ：	Designates the bit device to be forcibly turned ON or OFF.
FORCE ON button:	Forcibly turns the designated bit device ON.
FORCE OFF button:	Forcibly turns the designated bit device OFF.
Device ：	Designates the word device whose present value is to be changed.
Buffer memory ：	Designates the first I/O number (lowest digit unnecessary) and buffer memory address (decimal/hexadecimal) of the monitoring special function module.
Setting value ：	Sets the value to be changed. Before setting the value, designate decimal or hexadecimal, and 16-bit integral value, 32-bit integral value, real number (single precision), or real number (double precision)
Hide history (Display history) ：	Select whether the execution result of device test is to be displayed or hidden.
Set button ：	Click this button after making the necessary settings.

9.3 Device Batch Monitor

Monitor the bit & word device in batch mode

【Operating procedure】

Select【Online】⇨【Monitor】⇨【Device Batch Monitor】



【Description】

Click monitor :	Designate the device type to be monitored.
Device :	Designate the actual device number.
Start monitor :	Clicking this button after setting the device (buffer memory address) starts monitoring.
Value :	Sets the format of numbers to be displayed when monitoring.
Stop monitor :	Stops device (buffer memory) batch monitoring.
Device test :	Clicking this button displays the device test dialog box.
Device batch monitor :	The designated device is displayed in accordance with the monitor format, display, value, and option settings.

Chapter 10 Registering Keyword

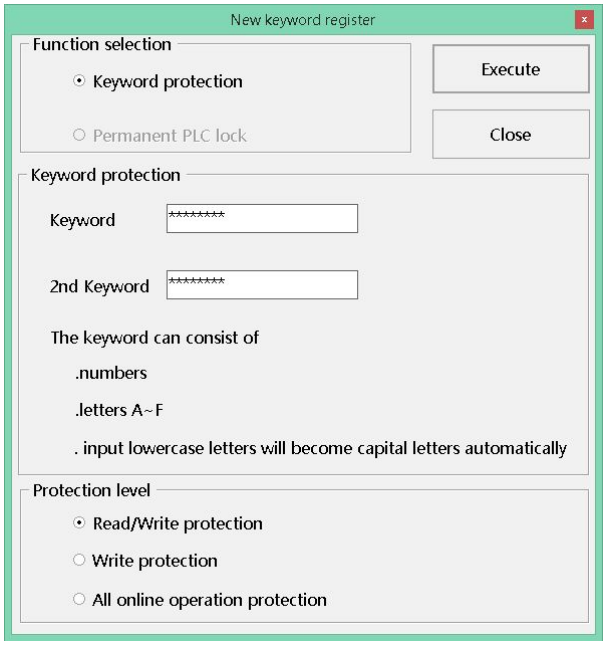
This chapter describes the operation of keyword.

10.1 Registering new Keyword/Changing Keyword

Registering a new keyword to the programmable controller or changing the entry code.

【Operating procedure】

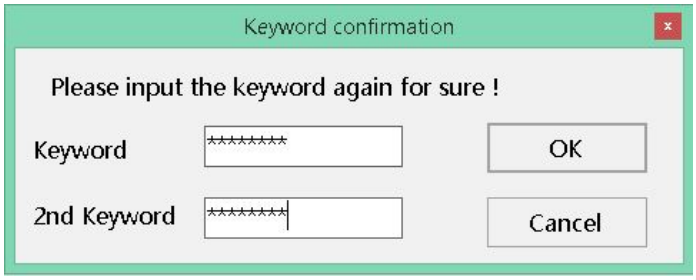
1. Select【Online】⇨【LogKeyWord】⇨【NewLog】, the following dialog box pop up.



【Description】

Function selection :	Default "Keyword protect" selected and unchangeable.
Keyword input :	Set the keyword (eight characters including numbers and alphabets from A to F)
2nd keyword :	Set a second keyword (eight characters including numbers and alphabets from A to F) **Only for HCA8 / HCA8C series PLC**
	The second keyword can be set after inputting the first keyword.
Protection level :	Read/Write protection Writing, reading, and verification are restricted.
	Write protection Writing is restricted. **Only for HCA8 / HCA8C series PLC**
	All online operation protection Writing, reading, verification, and device monitor are restricted. **Only for HCA8 / HCA8C series PLC**

2. Select【Execute】 and the dialog box of "Keyword confirmation" pop up to confirm the keyword.

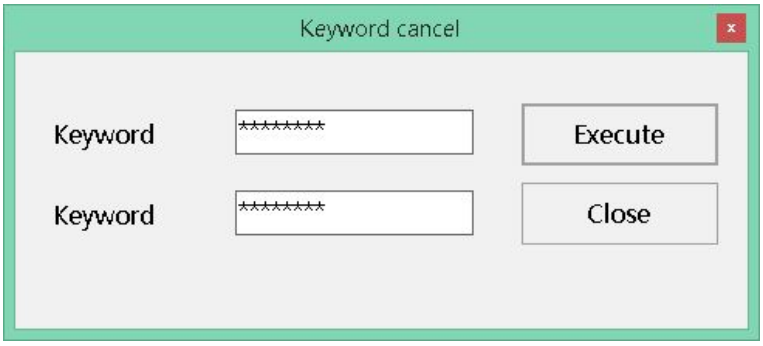


10.2 Deleting a Keyword

Cancels (deletes) the keyword registered to the programmable controller.

【Operating procedure】

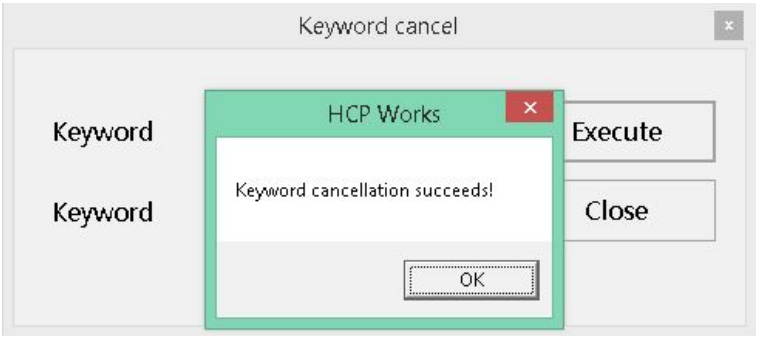
1 . Select【Online】⇨【LogKeyWord】⇨【LogDeny】and the Keyword Cancel pops up.



【Description】

Keyword：	Set a keyword (eight characters including numbers and alphabets from A to F)
2nd keyword：	Set the 2nd keyword (eight characters including numbers and alphabets from A toF) **Only for HCA8 / HCA8C series PLC**
	The second keyword can be set after inputting the first keyword.

2 . Select【Execute】to delete the keyword.

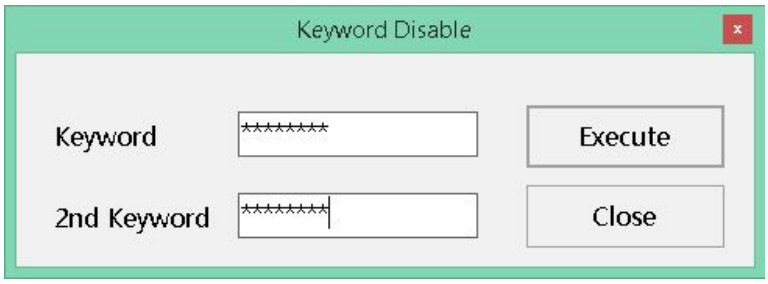


10.3 Disabling a Keyword

Releases the lock imposed by a keyword in order to allow access to the programmable controller for which the keyword is registered.

【Operating procedure】

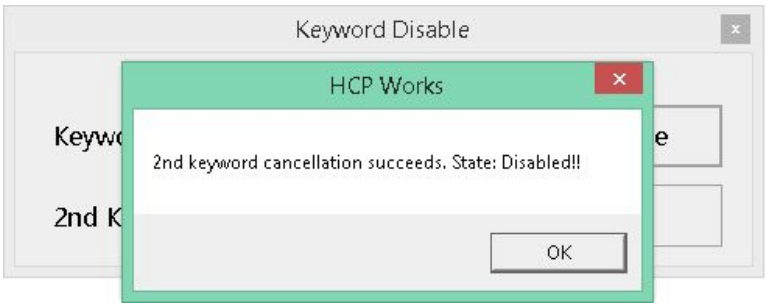
1. Select【Online】⇨【LogKeyWord】⇨【LogReplace】, and the dialog box of disabling keyword pops up.



【Description】

Keyword：	Set a keyword (eight characters including numbers and alphabets from A to F)
2nd keyword：	Set the 2nd keyword (eight characters including numbers and alphabets from A toF) **Only for HCA8 / HCA8C series PLC**
	The second keyword can be set after inputting the first keyword.

2. Select【Execute】to disable the keyword.



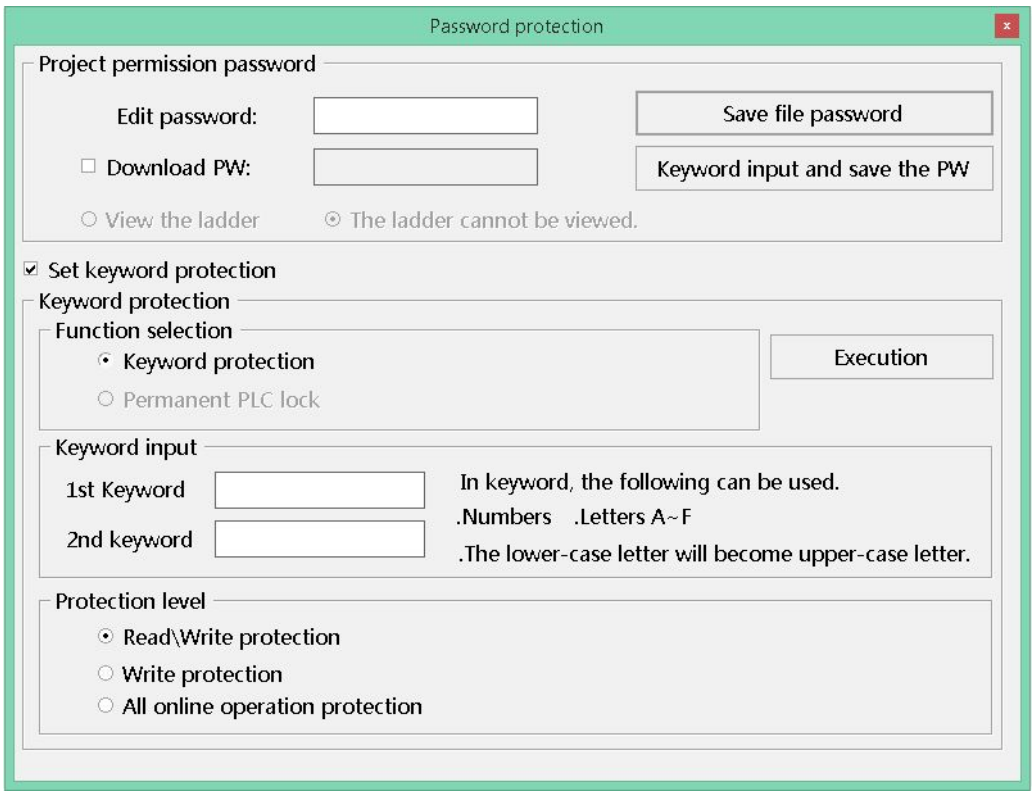
10.4 Registering Passwords & Password Protection

Registering a new password

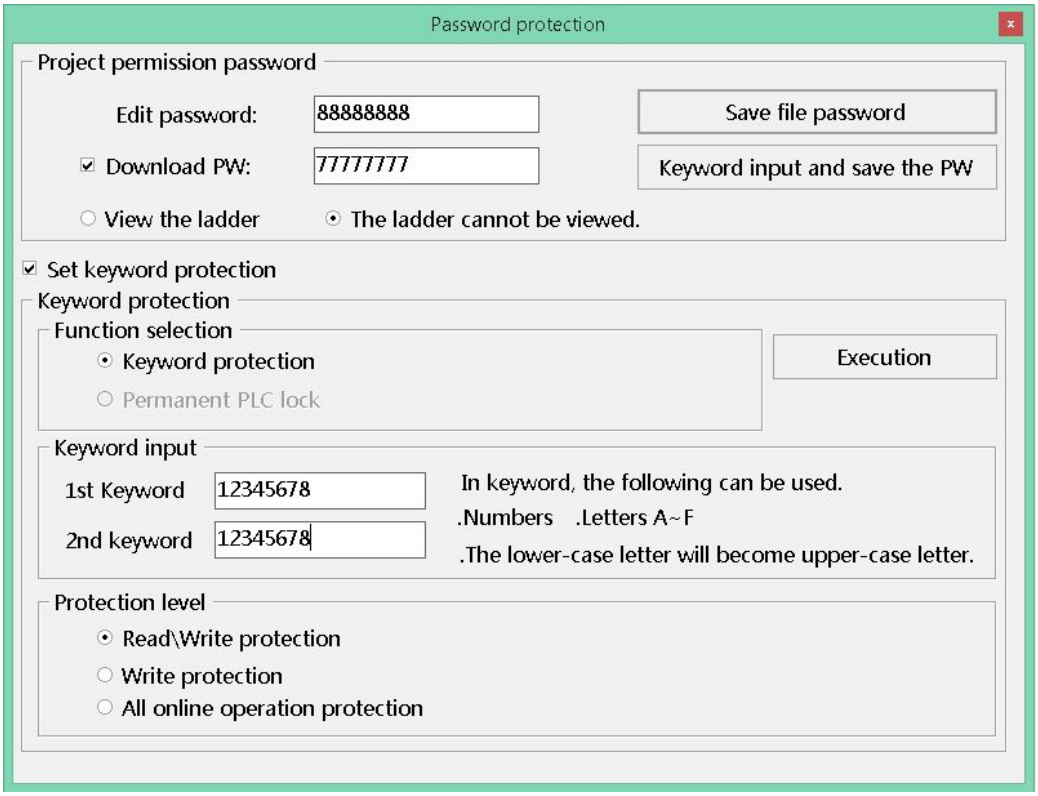
【Operating procedure】

1 . Select【Online】⇨【Keyword setup】⇨【Register】and the dialog box pops up .

2 . Check【Set keyword protection】.



3． Set “Edit password”.



【Description】

Edit password：	Administrator password. Can do all the operations in the ladder.
Download PW：	Some operations are limited for the user according to the selection.
Function selection：	Default “Keyword protect” selected and unchangeable.
Keyword input：	Set the keyword (eight characters including numbers and alphabets from A to F)
2nd keyword：	Set a second keyword (eight characters including numbers and alphabets from A to F) **Only for HCA8 / HCA8C series PLC**
	The second keyword can be set after inputting the first keyword.
Protection level：	Read/Write protection Writing, reading, and verification are restricted.
	Write protection Writing is restricted. **Only for HCA8 / HCA8C series PLC**
	All online operation protection Writing, reading, verification, and device monitor are restricted. **Only for HCA8 / HCA8C series PLC**

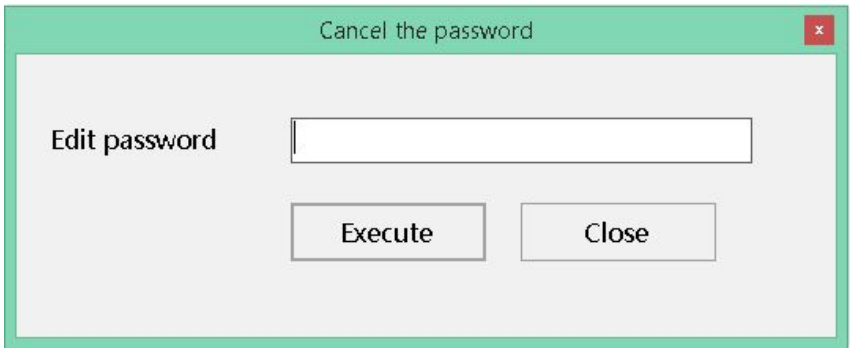
4． Click ” Save file password ” .

10.5 Deleting a Password

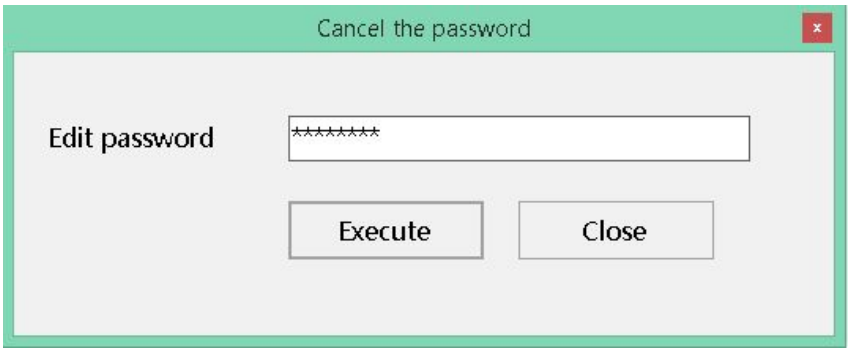
Deleting a edit password

【Operating procedure】

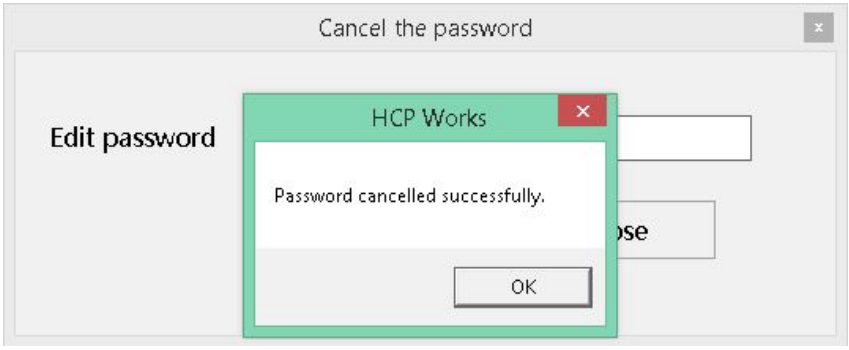
1. Select【Online】⇨【Keyword】⇨【Delete】, and the Password Cancel pops up.



2. Input【Edit password】, select "Execute" 。



3. Password cancelled successfully 。



10.6 PLC Keyword

Register a new keyword to the PLC（For LX / TX / HCA1 / HCA2 series）

【Operating procedure】

1． Select【Online】⇨【Keyword】⇨【PLC Keyword】and the dialog box pops up.

【Description】

Permanent： Protect PLC program permanently.

Clearing program： Clear PLC program.

Chapter 11 Program Check and Diagnostics

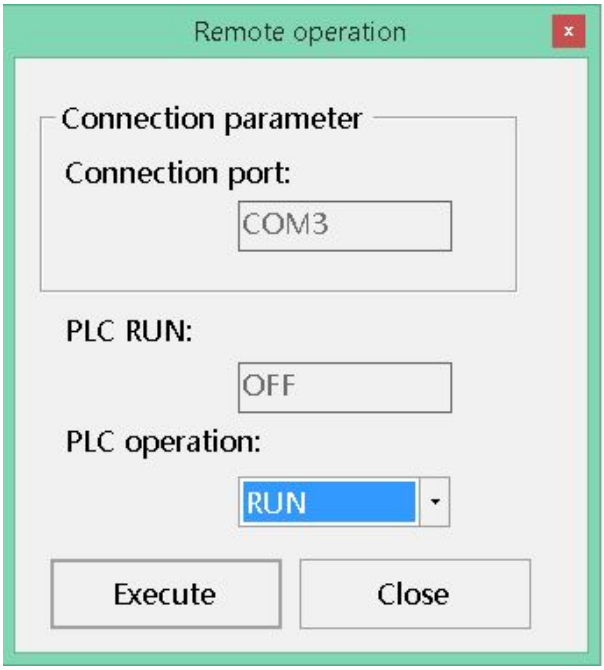
This chapter describes how to check and diagnose the PLC .

11.1 Remote Operation

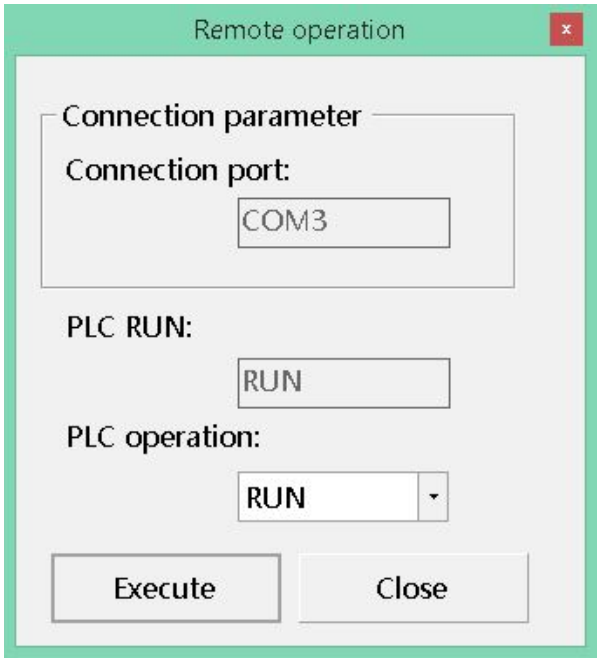
Switch the execution status of the PLC

【Operating procedure】

1 . Select【Online】⇨【Remote operation】, and the dialog box pops up .



2 . Select the PLC operation(PLC status) and click "Execute" button .

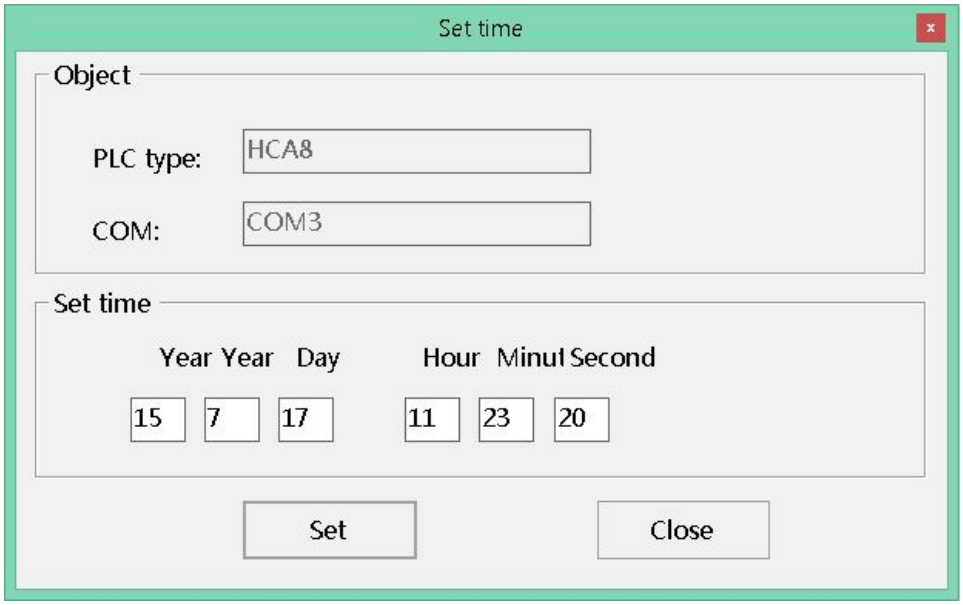


11.2 Setting Clock

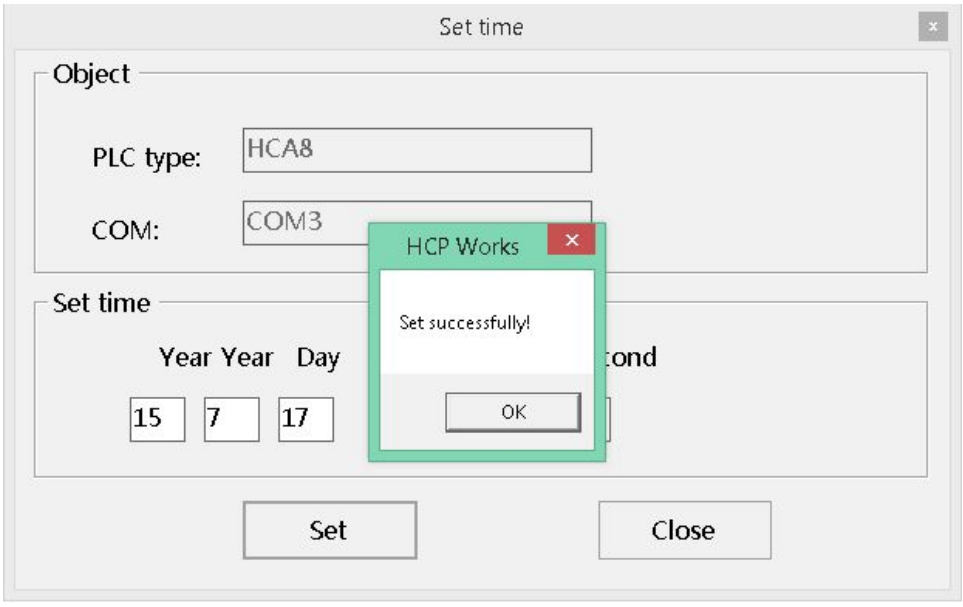
Set the time of the internal clock of the PLC

【Operating procedure】

1 . Select【Online】⇨【Set clock】and the dialog box pops up.



2 . After set the date and time, click "Set" button .

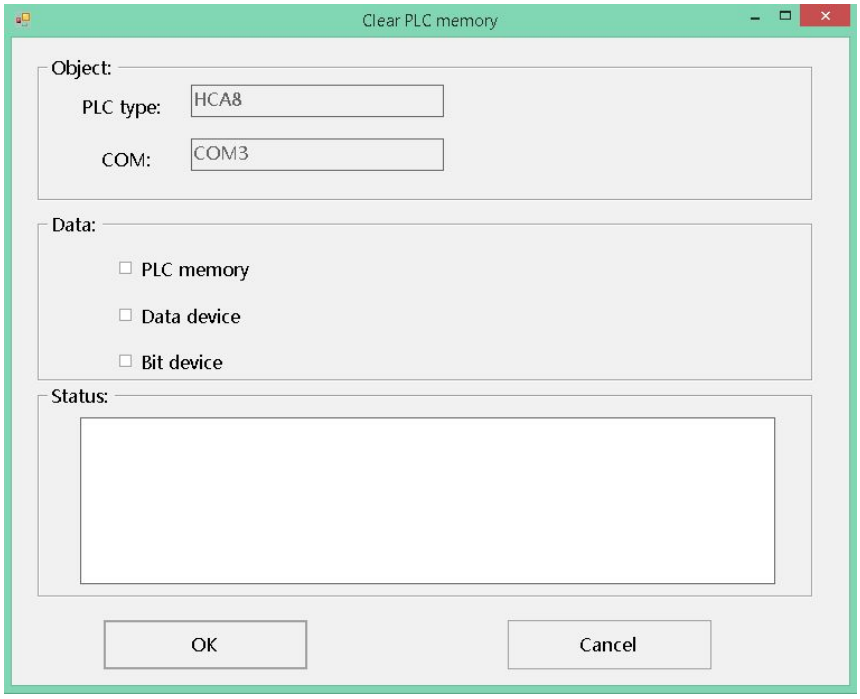


11.3 Clearing PLC Memory

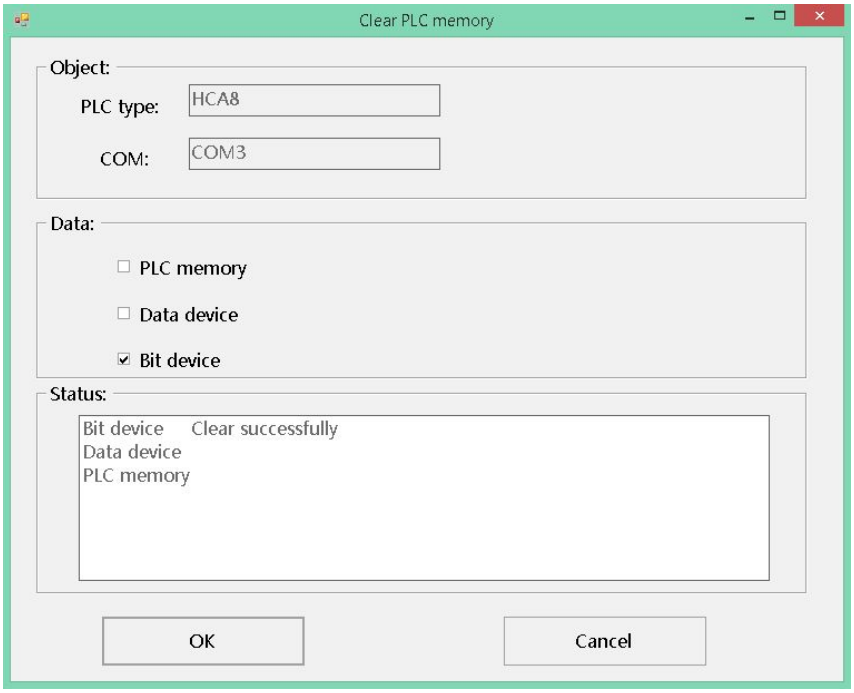
Clear PLC Memory

【Operating procedure】

1 . Select【Online】⇨【PLC Memory】⇨【Clear PLC memory】and the dialog box pops up .



2 . Click "OK" button after setting all necessary settings .

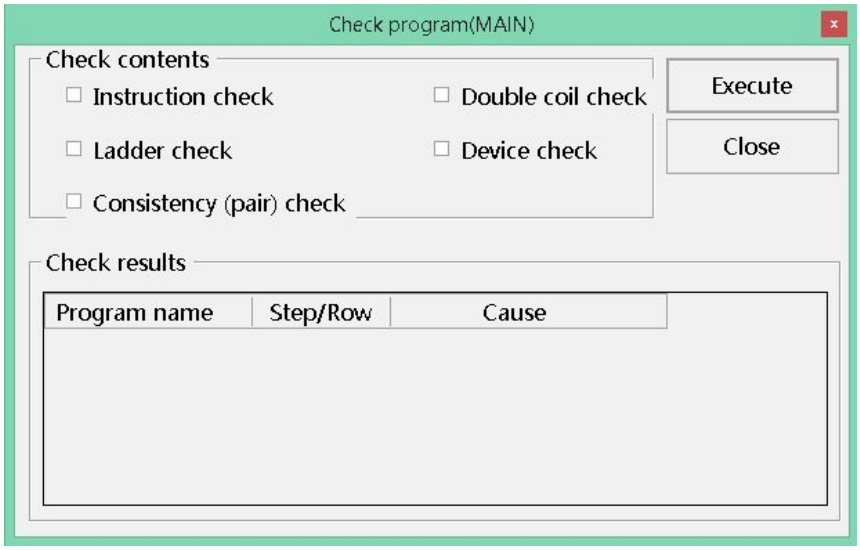


11.4 Checking Program

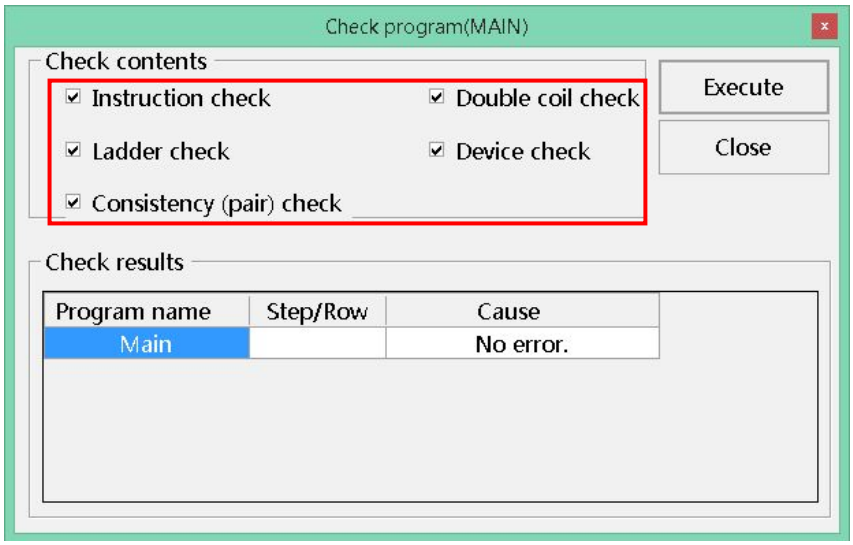
Checks for logical errors and input errors in programs

【Operating procedure】

1. Select【Online】⇨【Check program】and the dialog box pops up .



2. Select the items to be checked and click "Execute".

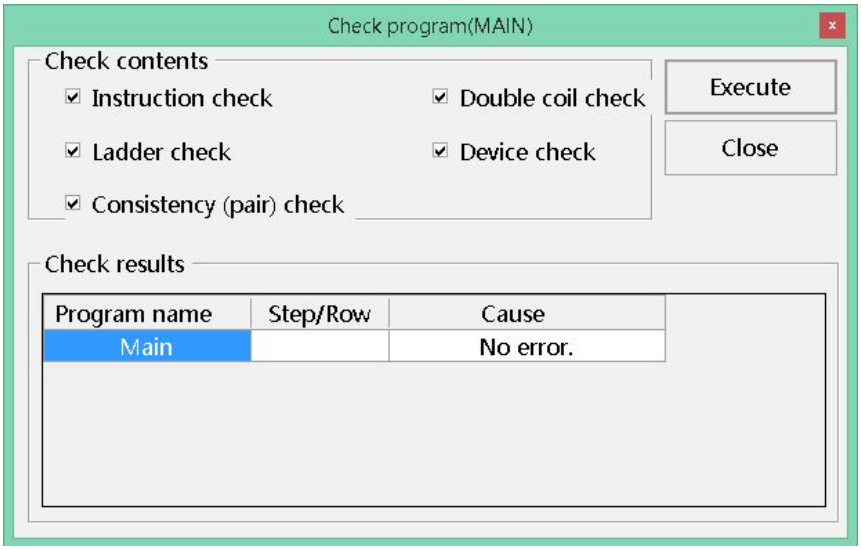


11.5 Checking Parameter

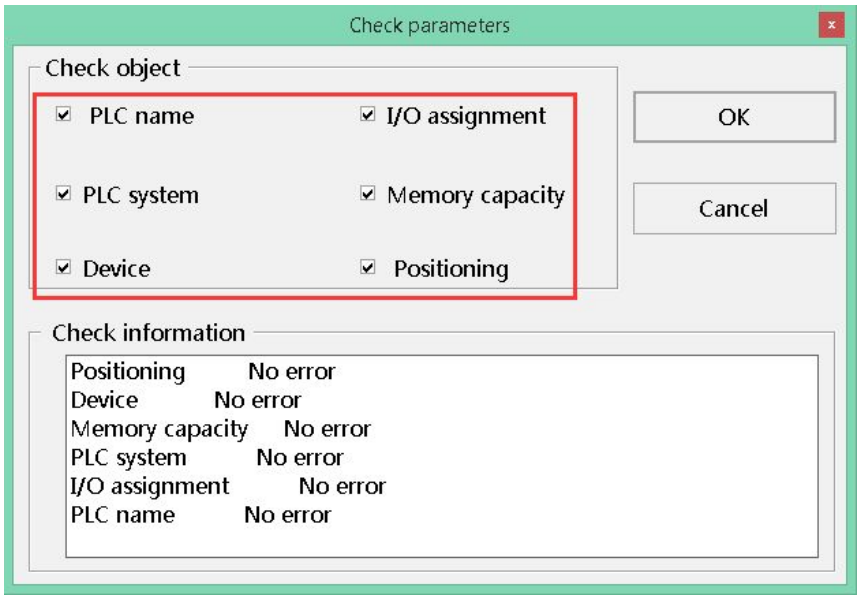
Checks for errors in the parameter settings

【Operating procedure】

1. Select【Online】⇨【Check parameter】and the dialog box pops up .



2. Select the items to be checked and click "OK".

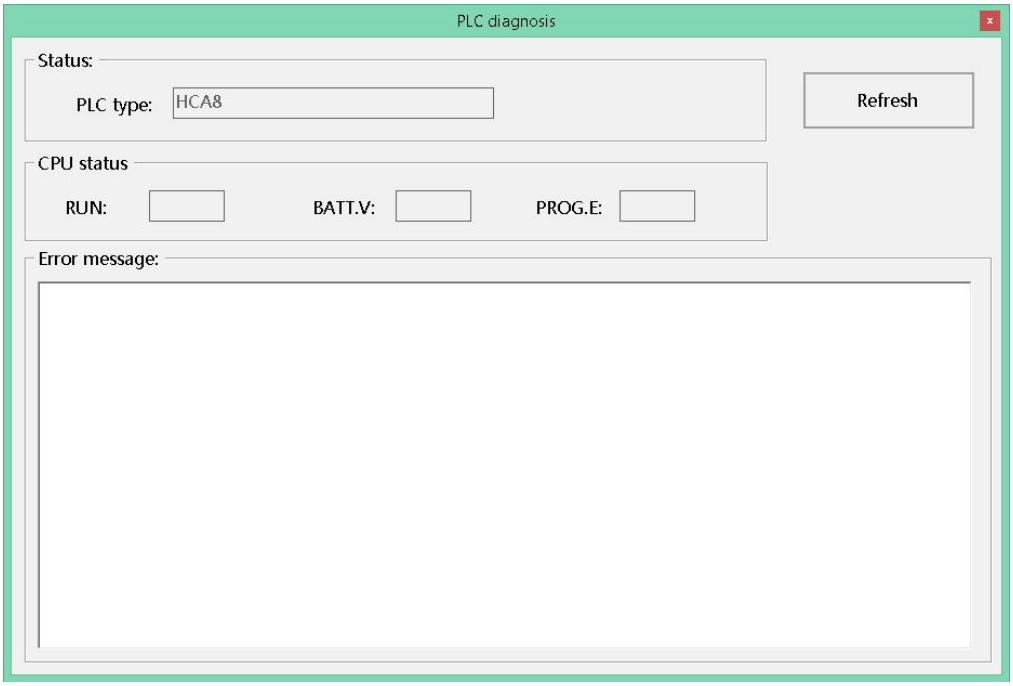


11.6 PLC Diagnostics

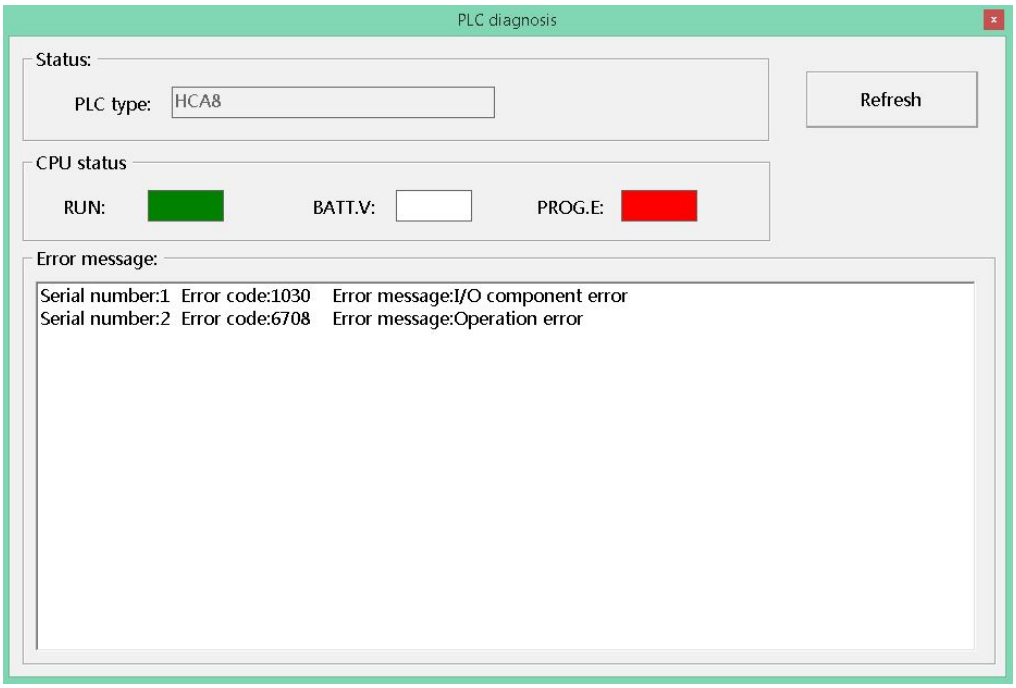
Checks the programmable controller for abnormal conditions and errors

【Operating procedure】

1 . Select【Online】⇨【PLC diagnostics】and the dialog box pops up .



2 . Select “Refresh” and the error details will be displayed .



Chapter 12 Device Memory

This chapter gives an overview of the device memory and the settings.

12.1 Device Memory

12.1 Device Memory

List of device memory

Device name	Classification of usage	HCA1 / LX1S / DDUP	HCA2 / LX1N	HCA8 / HCA8C
Input relay		X000 - X017	X000 - X177	X000 - X377
Output relay		Y000 - Y015	Y000 - Y177	Y000 - Y377
Auxiliary relay	For general (changeable)	M0 - M383	M0 - M383	M0 - M499
	For keeping (changeable)	M384 - M511	M384 - M511	M500 - M1023
	For keeping (fixed)		M512 - M1535	M1024 - M7679
	For special	M8000 - M8255	M8000 - M8255	M8000 - M8511
State	Initial state	S0 - S9	S0 - S9	S0 - S9
	For general (changeable)			S10 - S499
	For keeping (changeable)	S10 - S127	S10 - S127	S500 - S899
	For annunciator			S900 - S999
	For keeping (fixed)		S128 - S999	S1000 - S4095
Timers	100ms	T0 - T31	T0 - T191	T0 - T191
	100ms (for sub or interrupt program)	T32 - T62	T192 - T199	T192 - T199
	10ms		T200 - T245	T200 - T245
	1ms accumulation	T63	T246 - T249	T246 - T249
	100ms accumulation		T250 - T255	T250 - T255
	1ms			T256 - T511
Counters	Increment for general (16 bits)	C0 - C15	C0 - C15	C0 - C99
	Increment for keeping(16 bits)	C16 - C31	C16 - C199	C100 - C199
	Both directions for general (32 bits)		C200 - C219	C200 - C219
	Increment for keeping (32 bits)		C220 - C234	C220 - C234
	1-phase 1-count input in both directions (32 bits)	C235 - C245		C235 - C245
	1-phase 2-count input in both directions (32 bits)	C246 - C250		C246 - C250
	2-phase 2-count input in both directions (32 bits)	C251 - C255	C235 - C255	C251 - C255

Device name	Classification of usage	HCA1 / LX1S / DDUP	HCA2 / LX1N	HCA8 / HCA8C
Data register	For general (16 bits) (changeable)	D0 - D127	D0 - D127	D0 - D199
	For keeping (16 bits) (changeable)	D128 - D255	D128 - D255	D200 - D511
	For keeping (16 bits) (fixed) File register	D1000 - D2999	D256 - D7999	D512 - D7999
	For special (16 bits)	D8000 - D8255	D8000 - D8255	D8000 - D8511
	For index (16 bits)	V0 - V7 , Z0 - Z7	V0 - V7 , Z0 - Z7	V0 - V7 , Z0 - Z7
Extension register				R0 - R32767
Extension file register				ER0 - ER32767
Pointers	For branching of JUMP and CALL	P0 - P63 (64 points)	P0 - P127 (128 points)	P0 - P4095
	Input interruption and input delay interruption	I000 - I599 (6 points)	I000 - I599 (6 points)	I000 - I599 (6 points)
	Timer interruption			I600 - I899 (3 points)
	Counter interruption			I010 - I060 (6 points)
Nesting	For master control	N0 -N7	N0 -N7	N0 -N7
Constant	Decimal number (K) (16 bits)	-32768 - +32767	-32768 - +32767	-32768 - +32767
	Decimal number (K) (32 bits)	-2147483648 - +2147483647	-2147483648 - +2147483647	-2147483648 - +2147483647
	Hexadecimal number(H) (16 bits)	0 - FFFF	0 - FFFF	0 - FFFF
	Hexadecimal number(H) (32 bits)	0 - FFFFFFFF	0 - FFFFFFFF	0 - FFFFFFFF
	Real number (E) (32 bits)			Decimal-point and exponential notations are possible.
	Character string ("")			Up to 32 one-byte characters can be used for a constant in an instruction.